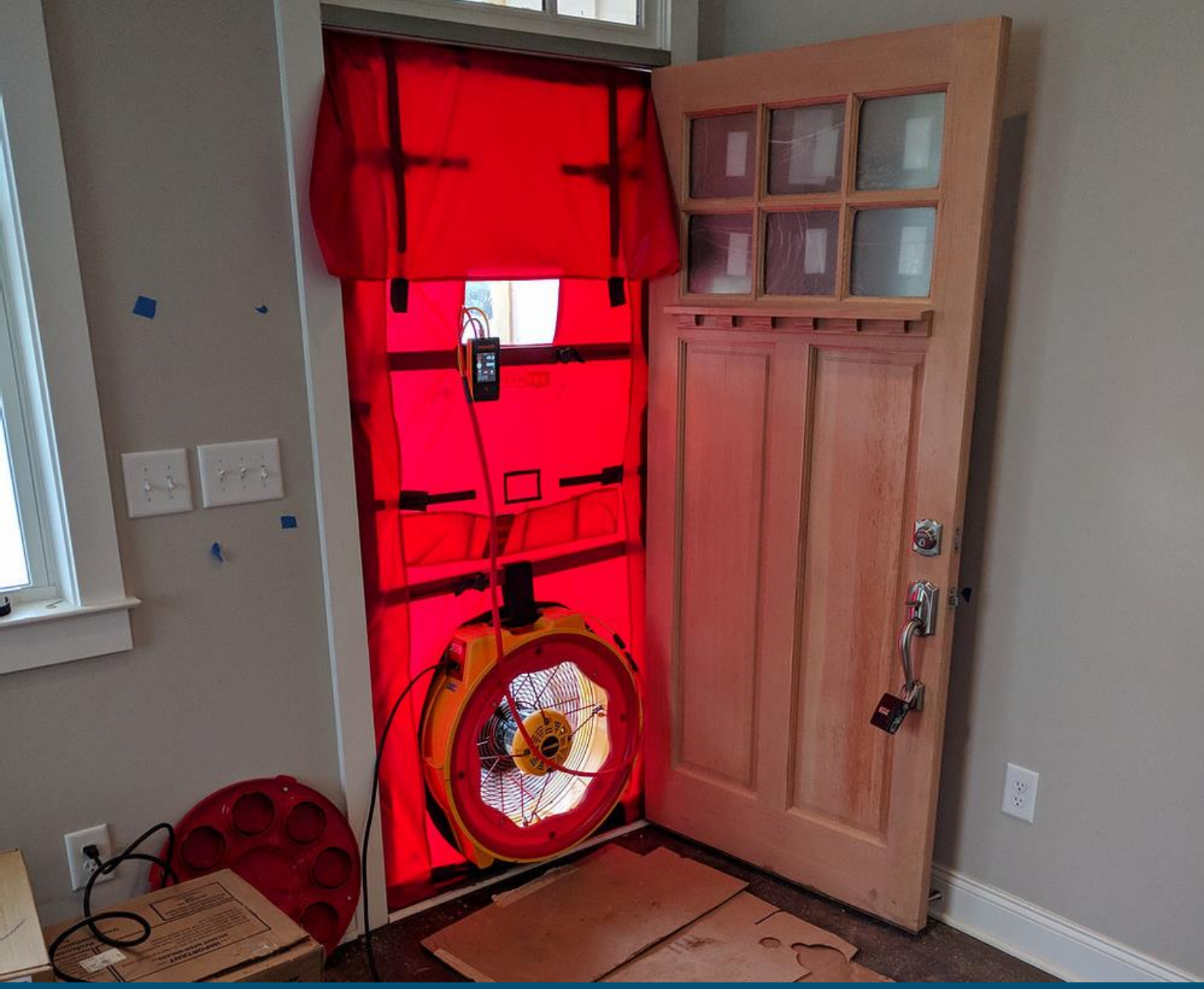


Financing Energy Efficiency for Low- and Moderate-Income Homeowners in Contra Costa County

LEO STEINMETZ

MAY 2021

ADVANCED POLICY ANALYSIS REQUIREMENT
FOR THE GOLDMAN SCHOOL OF PUBLIC POLICY

Title page image credit: Revive Energy, Nashville, depicting a blower door test, which measures how airtight a home is and helps identify necessary home insulation measures.

DISCLAIMER

The author conducted this study as part of the program of professional education at the Goldman School of Public Policy, University of California at Berkeley. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgments and conclusions are solely those of the author, and are not necessarily endorsed by the Goldman School of Public Policy, by the University of California or by any other agency.

ACKNOWLEDGEMENTS

Many people supported the writing of this report, but I would in particular like to thank the following:

Jody London, Alice Havenar-Daughton, and Qua Vallery, for hiring me in the first place, and for their support and friendliness, their suggestions and feedback, the many resources they directed me to, and their continued enthusiasm for this project

All my classmates in my APA section, especially Kirsten Ho and Asha DuMonthier, for their thorough and helpful feedback

My APA advisor Erika Weissinger, for her endless patience, crucial suggestions and support, and an astoundingly fast turnaround time for thorough feedback on my final draft

All of the people who were willing to talk to me for this project, for their time, their knowledge, and their tolerance of technological issues, including Candis Mary-Dauphin, Demian Hardman, Duanne Andrade, Jeff Deason, Greg Leventis, Greg Wikler, Jade Lim, Laura Glass, and Traci Hukill

Andrew Oung, for the many hours we spent working together on voice chat

Eva and Biko, for a wonderful home and community and all their emotional support

TABLE OF CONTENTS

EXECUTIVE SUMMARY

About this report

This report was commissioned by the Contra Costa County Department of Conservation and Development and by MCE, a community choice aggregator serving the northern San Francisco Bay Area. The purpose of this report is to provide a case study of the Solar and Energy Loan Fund in Florida and examine their methods for providing energy efficiency loans for low- and moderate-income homeowners, as well as examining other potential structures for energy efficiency financing. Information for this report was gathered through literature reviews and comparisons of organizational reports, and contextualized and supplemented with interviews with energy efficiency program workers, researchers, and industry experts.

Introduction

Low- and moderate- income (LMI) households have insufficient access to energy efficiency measures such as weatherization and efficient appliances. LMI households are excluded from access to energy efficiency measures through several mechanisms, including high up-front installation costs, low access to credit, high vulnerability to fraud, older housing stock in need of costly repairs, and environmental racism and segregation.

Loans may be an effective way to provide low- and moderate-income households with energy efficiency services. It is possible for savings on energy bills to outweigh loan costs, meaning energy efficiency loans can provide immediate savings for households.

However, debt can also create negative financial and emotional outcomes, especially for low-income households. Many low- and moderate-income homes require costly pre-work repairs before energy efficiency renovations are possible, which can prevent energy savings from fully offsetting loan costs. Loans also risk exposing vulnerable households to predatory inclusion and contractor fraud.

Energy efficiency loans may be most effective when interest rates are low, borrowers have significant protections, and loans fill access gaps in existing direct provision programs. Several programs exist to support LMI households in access to energy efficiency, but most of these programs have very low uptake. Additionally, not everyone has access to these programs: households with poor credit scores, homes which require prework repairs, and households in need of smaller loans have trouble accessing energy efficiency. For a more detailed overview of existing energy efficiency programs, see Appendix A.

Case Study: The Solar and Energy Loan Fund

The Solar and Energy Loan Fund (SELF) is an energy efficiency lender based in St. Lucie County, Florida. SELF began in 2011 as a revolving loan fund, using startup funding from the federal Energy Efficiency and Conservation Block Grant Program. SELF has since certified as a Community Development Financial Institution (CDFI) and added to their loan fund with investments from faith-based organizations, banks, and impact lenders. SELF has an active loan portfolio of $7.7 million and has provided over 1,200 residential loans.

SELF provides unsecured loans for a variety of home improvement projects, including energy efficiency, solar panel installations, sewer and water conversions, and accessibility improvements. Work must be done by verified contractors in SELF's network. Eligibility for these loans is based on demonstration of ability to pay rather than credit scores. Loan sizes vary between $1,500 and $50,000, with loan terms between 3 and 10 years and interest rates between 5% and 11%; average loan size is $8,500. SELF's loan profiles are similar to unsecured energy efficiency loans currently available in California through GoGreen Financing and the Residential Energy Efficiency Loan (REEL) program, but SELF's loans have slightly higher interest rates and are accessible to borrowers with lower credit scores.

Loan program features and strategies

SELF uses a variety of financial and structural mechanisms to fund their loans and ensure borrowers receive quality services. Many of these structures might be replicated by a new program, and each has its own advantages and challenges. Detailed descriptions and analysis of each of these features can be found in Section 3 of this report.

Funding strategies used by SELF include **revolving loan funds**, which can support long-term stability and low interest rates; **leveraging external credit**, which provides extra funding at slightly higher cost; and **crowdfunded lending**, which is cheap but places additional burdens onto borrowers. **CDFI certification** can also be used to gain access to additional credit.

SELF employs several strategies and loan features to protect borrowers from negative outcomes and provide quality services. **Unsecured loans** are crucial for protecting borrowers from the worst consequences of debt. **Non-standard eligibility requirements**, which use detailed income and expense information instead of minimum credit scores and debt-to-income estimates, may help additional borrowers gain access to loan programs, but are challenging to implement and increase the risk of exposing borrowers to dangerous debt burdens. Programs can also work to **lower interest rates for lowest-access borrowers**, which helps increase access and protect borrowers but requires additional external funding.

Contractor networks are crucial for ensuring quality work and protecting borrowers from fraud. **Energy audits** can also help ensure quality work and provide additional information, but requiring energy audits before work can be performed may create a large administrative barrier for borrowers.

Loan programs must allow funds to be used for **prework repairs**, non-energy work which must be completed before energy efficiency measures can be installed. Loan programs may also wish to allow **carveouts for non-energy-work** to help give homeowners more agency. However, prework repairs and non-energy carveouts can make quality control difficult and reduce cost-effectiveness.

Other promising strategies, which are not used by SELF, include delayed repayment, providing small loans for appliances, and coordinating application requirements across programs.

Delayed repayment is used by the Home Rehabilitation Loan Program (HRLP) in Washington State. HRLP's loans have no ongoing charges and no nonpayment penalties; loans must be paid at time of property sale, when borrowers ideally have additional cash and flexibility to repay loans. Delayed repayment can help borrowers complete more expensive projects without significant financial stress, and can make secured loans less dangerous. However, loans with delayed repayment have significantly higher up-front costs.

Small loans for appliances may be useful, as no energy efficiency financing options currently available in Contra Costa County allow for loans smaller than $2,500. Common installment plans for appliances like refrigerators, washing machines, and dryers have very high interest rates, so smaller low-interest loans may be able to alleviate financial burdens while incentivizing the purchase of efficient appliances. Small loans are costly to provide and difficult to promote, however.

Energy efficiency purchases are often eligible for tax credits or rebates, so programs might be able to **coordinate their requirements** to make it as easy as possible for households to access multiple programs. If possible, this could help grant borrowers access to additional resources, but could also lead to conflicts of interest or reliance on external programs.

Other important elements of energy efficiency lending

Program accessibility, transparency, and outreach are crucial to ensuring households are able to make use of any program. Applications must be easy to complete, with a straightforward application process, multiple ways to demonstrate eligibility, and minimally burdensome documentation requirements. Potential applicants must be able to easily gather further information about the program. Applications must be processed quickly and applicants should be aware of response timelines. Programs should provide transparent information about program outcomes, including borrower demographics, loan characteristics, installations, and loan outcomes.

Borrower protections should ensure that when things go wrong, borrowers are not faced with harsh penalties or negative outcomes. Payment flexibility, including temporary payment deferrals, no harsh penalties, and the possibility of loan forgiveness can significantly reduce the risk of serious harms to borrowers. Programs should have a robust complaints process to ensure that harms to borrowers are addressed.

A new energy efficiency financing program may not be the most effective way to increase access to energy efficiency. Other strategies to consider include increasing outreach for REEL loans, seeking additional funding for weatherization assistance, or sponsoring collaborations between programs to provide existing energy efficiency services to the households who can benefit most.

Key recommendations for a new loan program in Contra Costa County

The most appropriate strategies for any loan program will depend on the program's priorities and resources. However, taking into account specific needs and access gaps for LMI homeowners in Contra Costa County, some program features and strategies are particularly important.

- Loans should be unsecured
- Loan programs should use a contractor network for contractor verification and quality control
- Programs must provide a way to perform prework repairs
- Programs must commit resources to outreach, program accessibility, and transparency
- Programs must provide a robust complaints process
- New loan programs should attempt to enroll in REEL
- New loan programs should try to begin with a grant for a revolving loan fund
- Program creators should seriously consider whether or not a new loan program is the best strategy for providing energy efficiency

Other strategies are recommended but may be challenging to implement.

- Programs should provide borrowers with repayment flexibility and consider forgiving loans when needed
- Programs should attempt to subsidize interest rates for lowest-access borrowers
- Programs should consider offering loans with delayed repayment options
- Programs should consider competing with appliance installment plans

ABOUT THIS REPORT

This project was commissioned by the Contra Costa County Department of Conservation and Development, in partnership with MCE, the community choice aggregator in Contra Costa. MCE and the County are interested in identifying financing options for energy efficiency and clean energy projects that are accessible to low- and moderate-income homeowners. The purpose of this report is to provide a case study of the Solar and Energy Loan Fund in Florida and examine their methods for providing energy efficiency loans for low- and moderate-income homeowners, as well as examining other potential structures for energy efficiency financing.

I, the author, am a second-year master's student at the Goldman School of Public Policy at UC Berkeley. This report was written with support from my classmates and a faculty advisor, and fulfills my Advanced Policy Analysis degree requirement.

This report has a very narrow scope, focusing on loan programs and strategies which could be implemented on a local or regional scale, and on program features which directly impact borrower experiences. I cover many important aspects of energy efficiency financing, but I also leave many out. Discussions of specific loan approval thresholds, legal and regulatory analysis of the process of starting a new lending organization, concrete numerical statements about necessary funding and staffing; all these things and more were beyond what I could accomplish. Instead, I have focused on crucial agenda-setting questions which would be faced by the creators of a new energy efficiency lending program: Who are you trying to help? How are you trying to help them? And what program structures might contribute to accomplishing your goals? These questions cannot be answered definitively, and involve ethical and value considerations as much as they involve strategic ones. But I hope this report helps any reader address them and consider them in new ways.

To gather information for this report, I conducted nine informal, semi-structured interviews with experts and stakeholders. These included Contra Costa County employees working on energy efficiency, program managers and representatives for energy efficiency programs, and academic researchers working on energy efficiency financing. These interviews provided key context and direction, and guided me toward other information sources. Only a small amount of the information in this report is taken directly from those interviews, and all of that is in case studies and descriptions of programs. The rest of this information was collected through long hours of internet research: digging through quarterly reports looking for rough outlines of strategies and outcomes, following chains of citations in academic articles, and finding similarities and differences and comparisons and commonalities between programs as much as possible.

There are two large gaps in my analysis. First, I did not interview any low- or moderate-income homeowners with energy efficiency needs or enrolled in energy efficiency programs. While I was able

to draw on existing survey work (BayREN's single family moderate income market characterization study[6] was particularly useful), I want to draw attention to this lack of direct engagement with the people this project aims to support. I am from a high-income family; I have not owned a home; I have not pursued energy efficiency repairs in any of the places I have lived. I am sure there are aspects of these issues that I have missed because of my lack of direct contact and personal experience with the process of performing energy efficiency work in a low- or moderate-income household.

I was also unable to interview any contractors. Contractors sometimes play the villain in this report, as many of the challenges LMI homeowners can face stem from their power imbalance with contractors. However, contractors are the actual providers of energy efficiency, and a program's success or failure depends in large part on how it engages with and supports contractors. I have done my best to provide suggestions about contractor networks and opportunities for job creation and equity, but my perspective is incomplete.

I have been incredibly grateful for the opportunity to work on this report and to explore this subject. Energy efficiency for low- and moderate-income homeowners sits at the center of crucial issues in environmental justice: housing equity, access to financial services, emissions reductions, public health, energy justice. I hope this report can provide at least a little bit of clarity and information to help address these issues.

About the footnotes

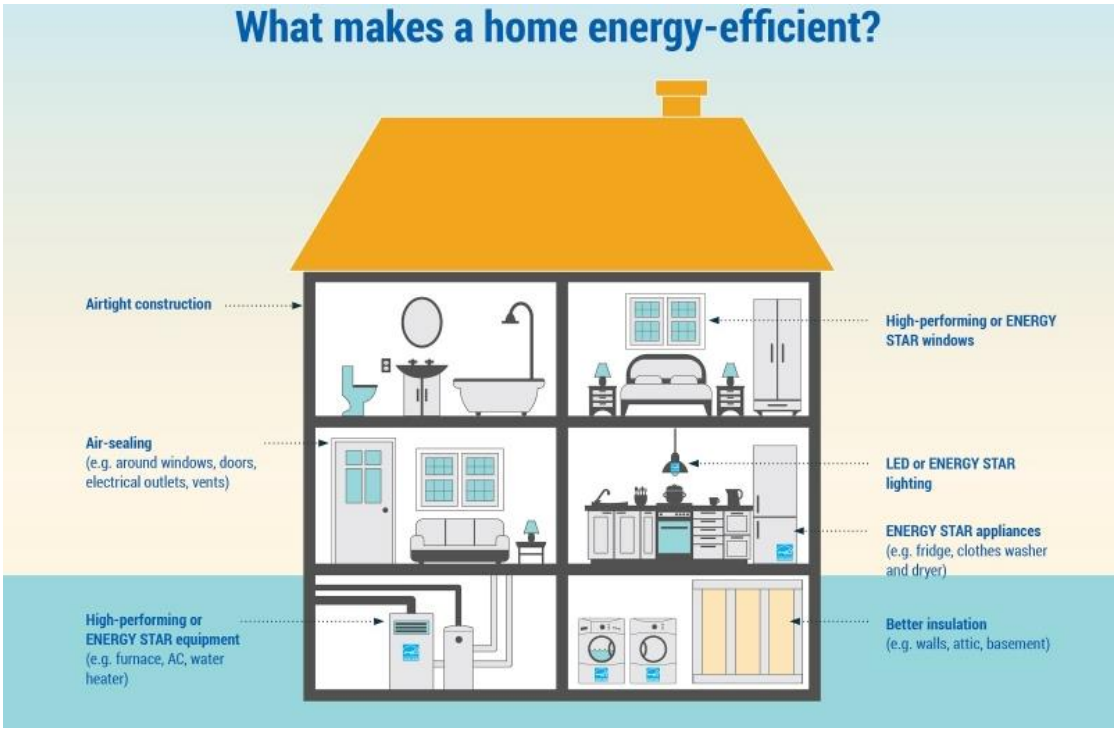
References in this document are included in footnotes, and all footnotes are also all listed sequentially at the end of the report as endnotes. Some documents are referenced multiple times, but I did not include repeated footnotes. When viewing this report in PDF form, clicking a reference number should bring you to the appropriate footnote. However, if the document is printed, it will likely be easier to find those cross-references in the endnotes.

RESIDENTIAL ENERGY EFFICIENCY FOR LOW- AND MODERATE-INCOME HOMEOWNERS

Residential energy efficiency in existing homes

Residential energy efficiency is a set of practices and technologies that help people use as little energy as possible in their homes, while ensuring they can still do everything that they want to do.

In existing homes, residential energy efficiency usually involves making changes to the building and its contents, such as modifying existing systems to make them more efficient, or replacing old appliances with more efficient versions. A particularly common energy efficiency measure is building insulation, which reduces the amount of energy needed to heat or cool a home. Building insulation can involve sealing and patching walls, roofs, windows, and doors to prevent air from leaking in or out, installing insulation in walls, ceilings, attics, and foundations, sealing ducts, and replacing heating and cooling units with more efficient versions. Water heating consumes a large amount of electricity, and water heaters can often be repaired or replaced to improve their efficiency. Other common measures include replacing inefficient appliances and installing efficient lighting.



This image depicts the most common household energy efficiency measures. Image from Natural Resources Canada[1].

[1] "What is an energy-efficient home" webpage, Natural Resources Canada. Last modified January 2, 2020; accessed May 3, 2021. https://www.nrcan.gc.ca/energy-efficiency/energy-efficiency-homes/what-energy-efficient-home/20548

Energy efficiency programs often include other systems which can reduce a building's energy bill. These can include programmable thermostats, solar water heaters, and solar panels. This broader umbrella of systems is most accurately described as "energy efficiency and clean energy," but "energy efficiency" and "clean energy" are both frequently used as shorthand for both categories together; see sidebar for definitions.

There is no defined total cost for energy efficiency. Costs for common energy efficiency and clean energy measures can range from tens of dollars (some efficient lighting) to hundreds (some efficient appliances) to thousands (weatherization services, heat pump furnaces, water heaters) to tens of thousands (solar panel installation). Some homes are already well-insulated and have efficient water heaters and HVACs, with little need for further efficiency measures. Other homes require a variety of energy efficiency services.

Low- and moderate-income households in Contra Costa County

Low- and moderate-income (LMI) is a broad term used to describe households who are generally resource-constrained. LMI populations are usually defined in reference to Area Median Income (AMI), which is the median household income of a region, usually a county or a group of counties. The Department of Housing and Urban Development (HUD) defines low-income households as those households with an income below 80% AMI, and moderate-income households as those households with an income between 80% and 120% AMI, with AMI usually distinguished by household size[2]. Other definitions are also common, including using 50% AMI as the cutoff between low- and moderate-income

[2] HUD User Website, Office of Policy Development and Research, Income Limits webpage. Accessed May 7, 2021. https://www.huduser.gov/portal/datasets/il.html#2021_data

ENERGY EFFICIENCY TERMINOLOGY

True energy efficiency measures include energy-efficient appliances and lights, building insulation, and efficient HVAC systems. These measures allow residents to use less energy while doing the exact same things.

Energy conservation involves changes in behavior that reduce energy use, such as turning out a lights when leaving a room, or turning down the thermostat at night. Some installations, like programmable thermostats, can automate energy conservation measures.

Clean energy generation allows buildings to generate their own electricity, almost always through solar panels. Solar panels are often much more expensive than other energy efficiency measures. Because solar panels are installed on buildings to reduce external energy use, they can often be provided using the same strategies that are used to provide energy efficiency.

Weatherization involves protecting a building from the elements, including heat and cold. While weatherization includes health and safety measures and protection from extreme weather, the primary purpose of most weatherization programs is to reduce energy spent on heating and cooling.

Electrification refers to the practice of switching systems from gas to electricity, such as furnaces, water heaters, dryers, and stoves. This allows homes to use clean electricity, but doesn't necessarily reduce energy consumption. Electrification measures often overlap with residential energy efficiency.

Other measures, primarily solar tube lighting and solar water heaters, can be difficult to categorize, as they involve fundamentally changing how a system works so it does not rely on electricity (or relies on it less). These measures are usually included in residential energy efficiency.

rather than 80%. In Contra Costa County in 2021, AMI is $125,600, meaning overall low-income households are those households with incomes less than $100,480, and moderate-income households are those households with incomes between $100,480 and $150,720. See Table 1 for breakdowns by household size.

According to the Census Bureau's Public Use Microdata from 2019[3], LMI households in Contra Costa County are more likely to live in certain cities, including Richmond, Pittsburg, Concord, and Antioch; are more likely to be Black, Hispanic, or Native; and are more likely to have barriers to speaking English, when compared to higher-income households and the population overall. Low-income households are more likely to live in multifamily housing and less likely to be homeowners; only about 51% of households with incomes below 120% AMI owned their homes in 2019, compared to about 81% of high-income households. Low- and moderate-income households are more likely to be exposed to pollution burdens, including from freeways and refineries[4].

Household size	Very low-income limit (50% AMI)	Low-income limit (80% AMI)	Moderate-income limit (120% AMI)
1	$47,950	$76,650	$115,000
2	$54,800	$87,700	$131,550
3	$61,650	$98,650	$147,950
4	$68,500	$109,600	$164,400
5	$74,000	$118,400	$177,600
6	$79,500	$127,150	$190,750

TABLE 1: 2021 INCOME LIMITS BY HUD STATUS[2]

Low- and moderate-income is not always a useful category; a household with an annual income of $60,000 and a household with an annual income o $120,000 have different resources and needs. In addition, income is not always a useful indicator of a households' access to resources and stability. Other categories, such as "ALICE" (asset-limited, income-constrained, employed)[5], can be useful for thinking about constraints on individuals independent of their relationship to income designations and poverty levels. Households can also be grouped by their eligibility for other programs, such as the Weatherization Assistance Program and California Alternate Rates for Energy. Income-based eligibility for these programs is defined by state or federal thresholds and is usually below 50% of Contra Costa's AMI.

[3] United States Census Bureau, ACS 1-Year Estimates-Public Use Microdata Sample. Accessed May 7, 202 at data.census.gov

[4] Draft CalEnviroScreen 4.0, accessed May 3, 2021 at https://www.aclima.io/blog/illuminating-hyperlocal-air-pollution-in-richmond-san-pablo-4d7fd59e9886. Specifically, high levels of Diesel Particulate Matter and Toxic Releases in residential areas of Richmond, including census tracts 6013376000, 6013377000, and 6013379000.

[5] United for ALICE website, accessed May 14, 2021 at https://www.unitedforalice.org/

Contra Costa County's LMI households have a higher homeownership rate than other counties in the San Francisco Bay Area[6]. This means providing service provision to LMI homeowners may be more important in Contra Costa than in other Bay Area counties, and that regional programs serving LMI homeowners may find Contra Costa a useful county to focus on or partner with.

Benefits of energy efficiency to low- and moderate-income homeowners

Energy efficiency measures allow residents to consume less electricity and save money on utility bills. This is particularly important for low- and moderate-income (LMI) households, as they pay a disproportionately high fraction of their income in energy costs. The median household in California, Oregon, and Washington pays 2.3% of their income in energy bills, while low-income households pay 6.8%[7]. LMI households also pay 15% more in energy costs per square foot[8]. Because low-income households often have very little discretionary income, decreases in energy bills can have disproportionately large positive impacts. Energy efficiency can also improve home values and net worth[9].

Energy efficiency also provides health co-benefits. LMI homeowners disproportionately live in older housing stock, which is more likely to need health and safety repairs, and is more likely to expose residents to toxins, moisture, and air quality issues[8]. In Contra Costa County, low-income residents near freeways and oil refineries experience higher levels of air pollution[4] [10]. Energy efficiency measures can help alleviate these issues. Improved HVAC systems can protect people from the risks of extreme heat[11] and improve mental health[12]. Better ventilation and moisture prevention can

[6] BayREN Single Family Moderate Income Market Characterization Study, Grounded Research and Consulting LLC. https://cbbf458e-67d0-4a11-9597-023b97b18cc4.filesusr.com/ugd/1ef210_a9da38337e86404f942e2152c7eb576b.pdf?index=true

[7] Ariel Drehobl, Lauren Ross, and Roxana Ayala (2020). "How High Are Household Energy Burdens? An Assessment of National and Metropolitan Energy Burden across the United States." American Council for an Energy-Efficient Economy. September 2020. https://www.aceee.org/research-report/u2006

[8] State and Local Energy Efficiency Action Network (2017). "Energy Efficiency Financing for Low- and Moderate-Income Households: Current State of the Market, Issues, and Opportunities." Prepared by: Greg Leventis, Chris Kramer, and Lisa Schwartz of Lawrence Berkeley National Laboratory. August 2017. https://emp.lbl.gov/publications/energy-efficiency-financing-low-and

[9] Northeast Energy Efficiency Partnerships, Inc. (2017). "Non-Energy Impacts Approaches and Values: an Examination of the Northeast, Mid-Atlantic, and Beyond." Prepared by: Samantha Caputo, Lisa Cascio, Serge Jean-Baptiste, Chris Tanner, Elizabeth Titus, and other NEEP staff. June 2017. http://www.neep.org/sites/default/files/resources/NEI%20Final%20Report%20for%20NH%206.2.17.pdf

[10] Aclima (2020). "Illuminating Hyperlocal Air Pollution in Richmond-SanPablo." By: Melissa Lunden. February 20, 2020; accessed May 3, 2021. https://www.aclima.io/blog/illuminating-hyperlocal-air-pollution-in-richmond-san-pablo-4d7fd59e9886

[11] Mary P Naughton, Alden Henderson, Maria C Mirabelli et al (2002). "Heat-related mortality during a 1999 heat wave in Chicago." American Journal of Preventative Medicine, May 2002. https://www.ajpmonline.org/article/S0749-3797(02)00421-X/abstract

[12] "Multiple Benefits of Energy Efficiency: Health and wellbeing" webpage, International Energy Agency. March 2019; accessed May 3, 2021. https://www.iea.org/reports/multiple-benefits-of-energy-efficiency/health-and-wellbeing

mitigate or prevent respiratory illnesses[13]. Replacing old appliances can help prevent exposure to certain toxins, including mercury and PCBs[14]. In March 2021, Contra Costa County launched the Contra Costa Asthma Initiative, a program that connects low-income residents with high rates of emergency room visits for asthma to the County's weatherization program, specifically to provide access to these health benefits[15].

Energy efficiency also gives people direct engagement with sustainability decision-making and practice. Lower-income people tend to have less political power[16], and are often excluded from opportunities to use sustainable products, many of which are expensive. Low-income people also face more exposure to pollution from fossil fuel extraction, processing, and use, and are more vulnerable to the consequences of climate change. Residential energy efficiency provides a way for low- and moderate-income people to make decisions around their own energy usage and impact the sustainability transition.

Finally, energy efficiency can be a source of jobs and economic activity, providing benefits to LMI workforces. After the Great Recession, the American Recovery and Reinvestment Act of 2009 used the Conservation Block Grant program as a vehicle for improving energy efficiency while also stimulating the construction sector[17]. The American Jobs Plan, the Biden administration's proposed infrastructure bill, also includes expanded energy efficiency measures as a way to "put union building trade workers to work[18]." Almost half a million California residents are employed in the energy efficiency and clean energy sectors, and many of those jobs have been lost during the COVID-19 pandemic, leading to a need for programs which will sponsor energy efficiency and create union jobs for energy efficiency and construction workers[19].

[13] Christine Liddell and Chris Morris (2010). "Fuel poverty and human health: A review of recent evidence." Energy Policy, June 2010. https://www.sciencedirect.com/science/article/abs/pii/S0301421510000625
[14] "Responsible Appliance Disposal (RAD)", Environmental Protection Agency. Accessed May 3, 2021. https://www.epa.gov/rad/consumers
[15] Contra Costa County Asthma Initiative presentation, given by Michael Kent, November 19, 2020. https://www.bayrencodes.org/wp-content/uploads/2020/11/05_Kent_Contra-Costa-Asthma-Initiative-Presentation.pdf
[16] Frederick Solt (2010). "Does Economic Inequality Depress Electoral Participation? Testing the Schattschneider Hypothesis." Political Behavior, January 2010. https://link.springer.com/article/10.1007/s11109-010-9106-0
[17] Wikipedia, "American Recovery and Response Act of 2009." Accessed May 3, 2021. https://en.wikipedia.org/wiki/American_Recovery_and_Reinvestment_Act_of_2009
[18] White House website, "FACT SHEET: The American Jobs Plan." March 31, 2021; accessed May 3, 2021. https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan/
[19] E2 (2020). "Clean Jobs California: America's Clean Energy Powerhouse in the Wake of COVID-19." June 2020. https://e2.org/reports/clean-jobs-california-2020/

Exclusion of low- and moderate-income homeowners from energy efficiency

Several interrelated factors make it harder for LMI homeowners to access energy efficiency.

High up-front costs: Energy efficiency is expensive, with average costs in the thousands of dollars for basic weatherization and appliance replacement services[20]. Even if a household would save money in the long term by performing energy efficiency work, most LMI households simply do not have the money to start such a project. Energy efficiency costs are often higher for LMI households, as they are more likely to live in older buildings which may require pre-work repairs or have more energy efficiency needs.

Low access to financing and credit: Low-income people have less access to financial services and tend to pay more for basic financial products and services[21]. This is also true for moderate-income people, to a lesser extent. This can prevent LMI homeowners from accessing loans to cover up-front costs, and it can increase the costs and risks of those financial services if they do choose to pursue a loan.

High vulnerability to fraud: LMI households are more vulnerable to financial exploitation and contractor fraud. They may be unable to afford energy audits, which identify the energy efficiency services that would be most helpful. They may have fewer choices for financial products and contractors, making it harder to avoid exploitation. They may not have the resources to extensively compare potential services, or use third-party evaluators or quality control. In

[20] Office of Energy Efficiency & Renewable Energy, U.S. Department of Energy. "Weatherization Assistance Program Fact Sheet." March 21, 2017. https://www.energy.gov/eere/wap/downloads/weatherization-assistance-program-fact-sheet

[21] Ian Dunham (2019). "Landscapes of Financial Exclusion: Alternative Financial Service Providers and the Dual Financial Service Delivery System." Business and Society Review, 2019. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3587806#

ENERGY EFFICIENCY FRAUD: WHAT DOES IT LOOK LIKE?

Homeowners have substantially less information about the costs and benefits of energy efficiency upgrades than contractors and lenders do. Because of this, it is easy for contractors and lenders to overstate the amount of savings that homeowners will gain from an energy efficiency measure, and it is easy for energy efficiency providers to recommend a suite of measures that are the most profitable, rather than being the most useful for the homeowners.

For example, a contractor might tell a homeowner that their water heater needs to be replaced, when in fact it is in perfectly good condition and already efficient. A contractor or program promoter might overstate the energy savings from a new solar panel installation, or claim that a program is eligible for large tax refunds which may or may not apply. A homeowner who has previously received free energy efficiency services through Weatherization Assistance or Energy Savings Assistance (see Appendix A) might be misled into believing a subsequent energy efficiency upgrade is free, and instead end up thousands of dollars in debt.

Other forms of fraud may emerge from incomplete protections or a lack of quality control. For example, a homeowner might have solar panels installed which require regular maintenance, only for the maintenance company to go bankrupt without any provisions for continuation of service.

All of the examples listed here are real events which happened to people in California, taken both from interviews and from the Berkeley Environmental Law Clinic report "The Dark Side of the Sun: How PACE Financing Has Under-Delivered Green Benefits and Harmed Low-Income Homeowners." [22]

the event of fraud, they have less access to legal services and litigation[22].

Environmental racism and segregation: The California Housing Partnership Corporation found in 2018 that segregation and high-poverty concentration are increasing in Contra Costa County. Approximately half of low-income Black and Latinx households live in segregated, high-poverty tracts, facing greater barriers to economic mobility and adverse health outcomes[23], largely as a result of discriminatory zoning principles and procedural barriers[24]. These conditions exacerbate energy efficiency inequities and leave LMI Black and Latinx households with fewer resources to pursue energy efficiency, and greater harms as result of its absence. Discriminatory conditions can also lead LMI households and people of color to rightfully mistrust public programs as well as programs relying on debt.

These exclusionary forces prevent LMI homeowners from accessing the benefits of energy efficiency, driving unequal outcomes in energy burdens, wealth, health, and sustainability access.

USING FINANCING TO PROVIDE ENERGY EFFICIENCY TO LOW- AND MODERATE-INCOME HOMEOWNERS

Energy efficiency has high up-front costs and creates consistent long-term savings on energy bills. Because of this, many policy makers and industry experts view loans as a particularly suitable method for energy efficiency service provision.

Advantages of using financing as a tool for energy efficiency

Net negative costs to borrowers: Many energy efficiency measures have net negative costs in the long term, because households can eventually save more on their energy bills than was spent installing the measure[8]. This is particularly likely for less expensive weatherization repairs, such as weatherstripping and duct sealing, and for replacing very old appliances. In ideal circumstances, where a loan has low interest rates and a long term, a borrower might save more in energy costs than they have to pay in loan costs. Even without those ideal circumstances, energy efficiency measures

[22] Berkeley Law Environmental Law Clinic (2021). "The Dark Side of the Sun: How PACE Financing Has Under-Delivered Green Benefits and Harmed Low-Income Homeowners." Prepared by: Claudia Polsky, Claire Christensen, Kirsten Ho, Melanie Ho, and Christina Ismailos. February 2021. https://www.law.berkeley.edu/wp-content/uploads/2021/02/ELC_PACE_DARK_SIDE_RPT_2_2021.pdf

[23] UC Berkeley's Urban Displacement Project and the California Housing Partnership. "Rising Housing Costs and Re-Segregation in Contra Costa County." No date provided, but based on citations, paper appears to be have been finalized in September 2018. http://urbandisplacement.org/sites/default/files/images/cc_final.pdf

[24] Contra Costa County Consortium (2016). "Analysis of Impediments to Fair Housing Choice." 2016. https://www.contracosta.ca.gov/DocumentCenter/View/45535/Contra-Costa-County-Consortium-AI-2015-2020-Update

often provide health and comfort benefits, and a homeowner might be happy with a minor increase in their monthly expenses when it comes with a safer or more comfortable home.

Extra security for lenders: Energy efficiency measures automatically provide borrowers with some monetary savings, meaning that borrowers may be more able to pay off energy efficiency loans than other types of loans. This can allow lenders to offer loans at lower interest rates and to lower-credit borrowers than they would otherwise.

Opportunities to support emergency repairs or larger renovations: Energy efficiency loans can make it easier for homeowners to make emergency repairs or perform general renovations. A homeowner whose water heater breaks might be more concerned with getting a new water heater than with lowering their utility bill, but an energy efficiency lender might allow the homeowner might be able to get a good loan to install a new efficient heater. A homeowner who intends to replace their roof or redo their kitchen might also wish to improve their home's energy efficiency, and might benefit from access to energy efficiency loans. Providing flexible, low-interest loans for energy efficiency can encourage homeowners to incorporate energy efficiency into projects they would pursue anyway.

Financial inclusion: Low- and moderate-income homeowners often have reduced access to financial services. Providing LMI households with financing for energy efficiency can help those households build credit and increase their access to other financial services.

Support, connections, and protections: An energy efficiency loan program can also provide protections and support to borrowers. The program can verify contractors to ensure quality installations and reduce fraud, provide energy audits to determine the most effective measures, and connect borrowers to other energy efficiency resources.

Inexpensive for governments and other entities to implement: Direct provision of energy efficiency creates many societal benefits, promoting economic equality, improving public health, and reducing emissions, in addition to the direct benefits to recipients; and direct provision programs create these benefits without imposing costs on low-income homeowners. But direct provision costs a lot of money, and loans ideally pay for themselves.

Limitations of financing as a tool for energy efficiency

Opening pathways for fraud and predatory inclusion: LMI homeowners are vulnerable to financial exploitation while owning property, making them a favored target of predatory industries. LMI homeowners with increasing home values or who have access to additional resources are all the

more attractive targets for exploitation[25]. By moving resources through vulnerable households, a loan program can expose LMI homeowners to contractor fraud and predatory inclusion, burdening them with debt they cannot handle, providing services that do not help them, or causing them to lose their property. These dangers are clearly demonstrated by the substantial history of fraud and predatory lending through the Property Assessed Clean Energy (PACE) financing mechanism[22].

Costs of debt: Debt comes with significant costs to LMI households. Even in the best-case scenario, where savings outweigh costs, debt influences a household's credit, limiting access to future financial services. Having debt can cause emotional and psychological distress and can increase the negative impact of external financial shocks[26]. Secured debt comes with the risk of property loss. And for many households whose homes require prework repairs, energy savings are unlikely to outweigh loan costs, meaning energy efficiency loans increase monthly expenses.

Administrative and opportunity costs: Financing programs have higher administrative costs than direct provision programs do. Financing services must thoroughly evaluate potential borrowers' finances; they must keep in contact with borrowers over long periods of time, involving administrative upkeep; they must devise methods for collecting in the event of nonpayment.

Financing programs also provide fewer benefits than direct provision programs do. If homeowners are able to reap the full rewards of energy savings, they will have increased discretionary income, which can provide cascading benefits[27].

Unjust shifting of responsibility: As discussed above (see Environmental racism and segregation), inequities in housing are deeply related to racist and class-exclusionary regulation and zoning. Using debt to address energy efficiency runs the risk of placing the financial responsibility for housing justice on low-income households, despite the fact that these conditions were in large part imposed on them by governments. Energy efficiency measures are not reparations and will not lift households out of poverty. Nonetheless, inequities in energy efficiency are symptoms of problems caused in large

---

[25] Patricia A. McCoy and Kathleen C. Engel (2007). "Predatory Lending and Community Development at Loggerheads." Boston College Law School Faculty Papers, January 2007. https://lawdigitalcommons.bc.edu/cgi/viewcontent.cgi?article=1785&context=lsfp

[26] Andrew Hood, Robert Joyce, and David Sturrock (2018). "Problem debt and low-income households." Institute for Fiscal Studies, January 2018.

[27] Researchers have accumulated substantial evidence that cash transfers to low-income people lead to disproportionately positive impacts, with local economic benefits as high as 2.7 times the initial cash influx. See: Hasdell, 2020, "What we know about universal basic income: a cross-synthesis of reviews" and Egger, Haushofer, Miguel, Niehaus, and Walker, 2019, "General Equilibrium Effects of Cash Transfers: Experimental Evidence from Kenya." Researchers have also found significant secondary benefits from energy subsidy programs such as California Alternate Rates for Energy, which are more comparable to the effects of an energy efficiency direct provision program. But focusing economy-wide costs and benefits can cover the basic moral point of such programs. Low-income people often do not have enough money to maintain stability and cover their basic needs, and giving them more money and more services is good, for them and for society as a whole, from a foundationally ethical standpoint as opposed to a strategic one.

part by governments and banks. The financial responsibility for addressing these problems should be on governments and banks, not on low-income households.

The streetlight effect: Only 3.5 million low-income Californians own their own homes, out of 12 million total low-income Californians[28]. In Contra Costa County, 51% of LMI households own their homes[3]. Homeowners benefit more from energy efficiency loans than renters do, gaining both property value increases and energy savings. Homeowners also have more access to federal financial support[29], and own property that can be leveraged for access to credit. Renters and people in mobile or informal housing have higher energy burdens[7]. Loan programs tailored for homeowners risk diverting effort toward the people who are easiest to help, rather than the people who need help the most.

Low versus moderate income: For the purposes of financing, low- and moderate-income homeowners are actually two very different categories with very different needs. Many stakeholders in energy efficiency agree that financing is not a good tool for service provision to low-income households, and that energy efficiency needs in low-income households should be addressed through methods that do not involve debt[30] [31].

[28] Reem Rayef (2020). "Housing Equity & Building Decarbonization in California." August 2020. https://nrdc1-my.sharepoint.com/:b:/g/personal/pdelforge_nrdc_org/EetZBNlTiDpPqlfDJTQDJVMBmJwVQFBoYP1AGIQCr1L5zw?e=dabgAt

[29] Will Fischer and Barbara Said. "Chart Book: Federal Housing Spending Is Poorly Matched to Need." Center on Budget and Policy Priorities. Updated March 8, 2017; accessed May 3, 2021. https://www.cbpp.org/research/housing/chart-book-federal-housing-spending-is-poorly-matched-to-need

[30] Opinion Dynamics. "Residential Energy Efficiency Loan Assistance Pilot: Final Impact Evaluation Report." January 2020. https://pda.energydataweb.com/api/view/2329/CPUC%20Group%20B%20FIN20%20REEL%20Evaluation%20Final%20Report%20FINAL%202020-01-13.pdf

[31] California Public Utilities Commission, Resolution E-5072, "Disposition of the Residential Energy Efficiency Loan Program." April 16, 2020. https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M333/K594/333594988.PDF

RENTERS AND ENERGY EFFICIENCY

Low- and moderate-income renters have similar energy efficiency needs to those of LMI homeowners; renters face similar access barriers as well. However, renters face several additional barriers to accessing energy efficiency[42].

Split incentives: Energy efficiency measures provide two financial benefits: increased property values, which go to property owners, and decreased energy bills, which go to renters. Because of this, both parties have significantly less incentive to pursue energy efficiency. Even when renters do wish to pursue energy efficiency, or have access to free services through WAP or ESA, property owners sometimes block these measures, preferring to maintain total control over their property.

Shorter time in homes: Renters move more frequently than homeowners do, meaning that they might perform energy efficiency upgrades only to leave the property before experiencing significant savings.

Large buildings: In multifamily housing, some energy efficiency measures like weatherization can only be applied to the entire building, meaning individual households have less control over their own energy efficiency.

No access to property-secured loans: While property-secured loans are usually inappropriate for LMI households across the board, they are completely inaccessible to renters.

Programs wishing to provide energy efficiency to renting households may need to focus on encouraging property owners to perform efficiency upgrades, rather than providing services directly to renting households. However, measures which focus on providing access to smaller appliances and lighting may still be appropriate for renters.

These limitations mean that financing should only be used as one tool in a portfolio of strategies for providing energy efficiency, and that financing for LMI households must come with strong borrower protections in order to avoid causing harms.

Using financing to fill service gaps in existing energy efficiency programs

Several programs accessible in Contra Costa County already provide energy efficiency upgrades for free, or provide loans or rebates for energy efficiency. Some of these programs are described in more detail in Appendix A, including the federal Weatherization Assistance Program (WAP), the federal Low Income Home Energy Assistance Program (LIHEAP), the utility-run Energy Savings Assistance Program (ESA), the state-sponsored Residential Energy Efficiency Loan (REEL), and the Bay Area Regional Energy Network's (BayREN) Home+ rebate program. Energy efficiency is also accessible to homeowners through Property Assessed Clean Energy (PACE) tax assessments, which are inappropriate for low- and moderate-income homeowners due to high interest rates and insufficient protections.

Many low- and moderate-income homeowners already have access to energy efficiency financing through REEL. REEL is a statewide program that involves a loan loss reserve for enrolled lenders who provide favorable loan terms to low-financial-access borrowers, and maintains a contractor network for service provision. Borrowers apply for REEL loans through the GoGreen Financing website, which provides information about enrolled lenders and eligible measures[32]. REEL loans are unsecured, have low interest rates, have no fees, and are provided by credit unions with a large capacity to increase uptake. New small loan programs are unlikely to be able to provide better terms to borrowers eligible for REEL unless they are able to significantly subsidize loans. Low-income households who do not qualify for REEL may instead be able to access direct provision of energy efficiency through WAP and ESA.

However, programs accessible in Contra Costa County do have several major access gaps:

- Direct provision programs for low-income households (WAP, LIHEAP, ESA) do not cover prework repairs, meaning people whose homes need significant repairs or replacements before energy efficiency work can be completed cannot access these programs.
- WAP and LIHEAP are oversubscribed, so many eligible low-income households are unable to access these services.
- REEL is inaccessible for individuals with credit scores less than 580, so individuals with poor credit who wish to pursue energy efficiency loans must rely on higher-cost personal loans or credit card debt.
- Direct provision programs do not cover many efficient appliances, and REEL has minimum loan sizes of $2,500, so people must rely on traditional measures like credit card debt and

[32] GoGreen Financing website, accessed May 12, 2021. https://gogreenfinancing.com/

installation plans to finance energy efficient appliances. REEL is currently attempting to address this issue by providing small REEL loans through utility marketplaces.

- Solar panel installations are not covered by any energy efficiency programs[33] except PACE, which is not appropriate for low- and moderate-income households. REEL may expand to allow solar panel financing in the future.

These service gaps create an opportunity for a new lender to help homeowners access existing programs and fill access gaps created by existing programs. A new lender focusing on closing access gaps might focus on providing one or more of the following services:

- supporting prework repairs in very low-income households to help households gain increased access to WAP and ESA
- supporting loans for moderate-income households with poor credit who can demonstrate ability to pay
- providing small loans for appliances

[33] Disadvantaged Communities – Single-family Affordable Solar Homes (DAC-SASH) is a direct provision program which installs solar panels on single-family homes in disadvantaged communities. It is not an energy efficiency program, however, and is currently oversubscribed. See https://gridalternatives.org/what-we-do/program-administration/dac-sash

The Solar and Energy Loan Fund (SELF) is a nonprofit community development financial institution (CDFI), based out of St. Lucie County in Florida. They provide loans for home improvement and repair projects, including energy efficiency, accessibility adaptations, and solar panel installations. They have provided over 1,200 loans and have an active residential loan portfolio of $7.7 million. They specialize in providing loans with low interest rates and long terms to low-income, low-credit, and low-financial-access borrowers.

For more information on SELF, please see their website[34], which contains links to their 2016[35] and 2017[36] annual reports, as well as their 2019 Q1[37] and Q3[38] impact reports. All the subsequent information in this case study was gathered from these reports and their website, and was contextualized by interviews with staff members and energy efficiency researchers.

History

SELF formed in 2011 in St. Lucie County. It was created with a $3 million seed grant through the Energy Efficiency and Conservation Block Grant program, which was itself funded through the American Recovery and Reinvestment Act of 2009, the Obama administration's stimulus package during the Great Recession.

SELF began as a nonprofit with several County Commissioners on the board. $1.7 million was allocated for the revolving loan fund, with the remaining $1.3 million to be used for setup. The initial funds were deployed rapidly, with $1.5 million loaned out by the end of 2013.

SELF's original mission statement focused on creating and reopening jobs in the construction sector through solar installations. Most early loans were used for weatherization and energy efficiency.

In 2013, SELF pursued CDFI certification. The organization reframed its mission to focus on providing loans specifically to low-income and limited-financial-access populations, and began soliciting new

[34] Solar and Energy Loan Fund main website, https://solarenergyloanfund.org/ accessed May 4, 2020
[35] SELF FY 2016 Annual Report "Rebuilding and Empowering Underserved Communities." https://solarenergyloanfund.org/site/wp-content/uploads/2019/11/SELF_2016-Annual-Report_2016.pdf
[36] SELF FY 2017 Annual Report "Rebuilding and Empowering Underserved Communities." https://solarenergyloanfund.org/site/wp-content/uploads/2019/11/SELF_2017-Annual-Report_2017.pdf
[37] SELF FY 2019 Summary / Q1 Impact Report, https://solarenergyloanfund.org/site/wp-content/uploads/2019/11/SELF-Q1-2019-Impact-Report.pdf
[38] SELF FY 2019 3rd Quarter Report "Rebuilding and Empowering Underserved Communities" https://solarenergyloanfund.org/site/wp-content/uploads/2019/11/SELF-Q3-2019-Impact-Report.pdf

investments to grow their loan fund. During this time, the remaining St. Lucie County Commissioners left the board, and the organization became more independent from the County. SELF simultaneously expanded and became more reliant on private and charitable investment. SELF raised new capital largely from faith-based organizations, acquiring several loans of between $10,000 and $400,000, with interest rates between 1% and 4%. Between 2013 and 2015, SELF acquired a total of $3.7 million in new lending capital.

SELF has continued to expand, and now operates throughout Florida, as well as in Georgia, South Carolina, and Alabama. As of the end of 2019, they have made $10 million in total loans, to 70% LMI households, with an average loan size of $8,500; they maintain $7.7 million in loan capital for their residential CDFI lending; and they have a network of 376 contractors.

Loan Program Details

SELF operates several different loan programs, many of which serve particular borrower populations or partner with other organizations. See Table 2 for loan parameter details.

Core Loans: SELF provides a set of similar loans for energy efficiency, wind mitigation, sewer and water conversions and repairs, and solar PV installations. These loans are all unsecured, use fixed interest rates, and have no minimum credit score or income limit. Loans are between $1,500 and $50,000. Loan terms are 3 years to either 8 or 10 years, depending on the type of loan. Interest rates vary from 5% to 11%, and are lowest for energy efficiency loans. Origination fees are 2.5%, and project management fees are 2.75% or 4%. SELF requires applicants to be current on their property taxes and mortgage loans, and to submit proof of ability-to-pay through detailed documentation of income and expenses. If ability-to-pay is not easily proven, SELF may require the applicant to provide a co-signer, or a cash guarantee of 5-20% of the project cost.

[39] The Desert Sun, Rob Nikolewski. "California begins debate on new rooftop solar rules: How might they affect you?" March 16, 2021. https://www.desertsun.com/story/news/environment/2021/03/16/california-begins-debate-new-rooftop-solar-rules-how-might-they-affect-you/4717953001/

ROOFTOP SOLAR PANELS FOR LMI HOMEOWNERS

Providing rooftop solar panels to LMI homeowners is particularly challenging. Solar panels are much more expensive than most energy efficiency measures, and frequently roofs and electrical systems must be repaired or replaced before solar panels can be installed. Solar panels are not appropriate for many homes, as they require particular roof shapes and angles to be effective. Despite these challenges, SELF has been able to provide some loans for solar panels to LMI households.

However, in California, residential energy generation is impacted by net energy metering (NEM) tariffs, which are currently being reviewed by the California Public Utilities Commission. It is possible that upcoming changes for NEM 3.0 will significantly reduce expected financial savings from installing residential solar panels[39].

Because of these upcoming changes, new loan programs may want to avoid focusing on providing solar panels in the short term. Access to residential solar for LMI households may be better provided through support of the Disadvantaged Communities Single-family Affordable Solar Homes program[33], or through partnerships with private third-party-ownership solar programs.

TABLE 2: SELF LOAN PARAMTERS

Loan Type	Eligibility Criteria	Secured or Unsecured	Minimum and maximum loan size		Interest	Minimum and maximum interest rates		Minimum and maximum loan terms		Origination and project management fees	
Energy Efficiency	Eligibility A	Unsecured	$1,500	$50,000	Fixed	5%	11%	3 years	8 years	2.5%	2.75%
Solar PV	Eligibility A	Unsecured	$1,500	$50,000	Fixed	7%	8%	3 years	10 years	2.5%	3.99%
Wind mitigation	Eligibility A	Unsecured	$1,500	$50,000	Fixed	8%	11%	3 years	8 years	2.5%	3.99%
Sewer and water	Eligibility A	Unsecured	$1,500	$50,000	Fixed	8%	11%	3 years	8 years	2.5%	2.75%
HALO accessibility	Eligibility B	Unsecured	$1,000	$25,000	Fixed	7.5%		5 years	7 years	2.5%	2.75%
KIVA	Eligibility A + Eligibility C	Unsecured	$1,000	$10,000	Fixed	5%		3 years	5 years	2.5%	2.75%
PACE	Eligibility A + Net Equity in Property	Secured (lien on property)	$5,000	$50,000	Variable	5.61%	6.71%	5 years	20 years	7.5% total	
Comparison: REEL through First U.S.	Minimum credit score 580	Unsecured	$2,500	$50,000	Variable	3%	7.5%	None	15 years	None	

Eligibility A: Proof of ability-to-pay, current on property taxes, current on home mortgage, no bankruptcy in past year, and possible requirement of co-signer or cash guarantee
Eligibility B: Proof of income, proof of disability, reasonable credit history, and sufficient disposable income to repay loan
Eligibility C: Demonstrated need and difficulty accessing capital from other lenders, must be able to provide inspirational story

PACE: SELF is a provider of both commercial and residential PACE in St. Lucie County. Their residential PACE loans are based on ability-to-pay documentation, with 5.6-6.7% interest rates and 5-20 year terms, as well as fees of 7.5%. Loan amounts can vary between $5,000 and $50,000.

HALO: In partnership with the Florida Alliance for Assistive Services and Technologies (FAAST) and the U.S. CDFI Fund Disability Program, SELF provides loans to households with disabled members for disability and home adaptation improvements. These loans have slightly different application criteria than SELF's other loans, and have a fixed interest rate of 7.5%, with loans between $1,000 and $25,000 over 5-7 year terms.

KIVA: KIVA is a global crowdfunded lending program based in San Francisco which provides crowdfunded, unsecured loans. Lending organizations can become field partners of KIVA, which allows them to submit loans to KIVA's crowdfunding platform and charge interest to borrowers, while paying a small fee to KIVA. KIVA's lenders do not receive any interest and are not compensated in the event of default.

SELF is a KIVA field partner, and uses KIVA to provide 5% interest loans to women, veterans, and military families with distressed credit histories and/or no credit scores. These loans have strict eligibility requirements, including the requirement "must provide inspirational story."

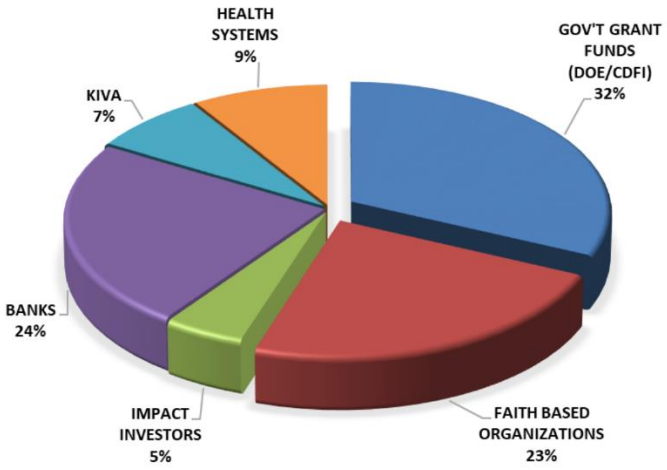
Contractor Network

SELF has a network of approved contractors. These contractors apply for verification with SELF and go through a contractor training. There is no fee for contractors, nor is there a finder's fee rewarding them for bringing in clients. The primary draw for contractors is access to new clients who would otherwise be unable to pay for services.

Contractors in the network can refer clients to SELF but cannot themselves close installation deals or negotiate terms. Contractors provide a quote beforehand, are given notice-to-proceed after the loan is confirmed, and are paid after inspection is submitted. With additional application processing, contractors can access payments before performing work, to offset up-front costs.

SELF does not require energy audits or enforce a strict cost-effectiveness test on installations. This allows work to proceed quickly, at the risk of efficiency installations not always providing an overall financial benefit to the borrower and creating some risk for contractor fraud.

Funding Sources



SELF's funding sources as of 2019.
Image from Q1 Impact Report 2019[37].

As of 2019, SELF had a total amount of raised capital of $8.2 million. While they have acquired some grants and donations, the majority of their funding is in the form of low-interest loans from investors. SELF's funding is gathered from the following sources:

- 32% grants from the federal government (Department of Energy and CDFI Fund)
- 24% loans from banks
- 23% loans from faith-based organizations
- 9% loans from health systems
- 7% loans raised through KIVA
- 5% investments from impact investors

For a full list of loans, grants, interest rates, and loan terms, see SELF's Q1 Impact Report from 2019. The median loan interest rate is 2.5%, and the median loan term is 5 years. The mean interest rate is 2.4% and the mean loan term is 4.2 years. Loans range in size from $20,000 to $1,150,000, with half the loans lying between $100,000 and $400,000.

Impacts

Has SELF been successful? By most measures, yes. SELF has provided loans to a large number of low- and moderate-income households, and those households appear to have benefitted from access to the program. As of 2020, SELF has granted over $10 million in total loans, and 70% of these loans have gone to LMI households. These loans have a less than 1.5% default rate. SELF's loans have retrofitted over 1,200 homes and sponsored over 30,000 job hours. SELF has also continued to exist and expanded over a decade during which many other energy efficiency financing programs have struggled, due to financing challenges, lawsuits, or lack of engagement.

However, SELF is not an outlier among existing energy efficiency or home renovation financing programs. No low-interest lending program examined for this report[40] has reported default rates higher than 2%. SELF's interest rates are higher than comparable programs in California accessible through GoGreen Financing, as are their fees; however, SELF's loans are accessible to lower-credit applicants.

SELF is neither highly successful nor unsuccessful in terms of scale. St. Lucie County, where SELF started, has over 100,000 households; SELF has supported the retrofits of about 1,200 homes total across multiple states. While it is challenging to estimate uptake directly, it seems that SELF's uptake rate is comparable to uptake rates of other energy efficiency loan programs, including GoGreen Financing in California and the Home Rehabilitation Loan Program in Washington. (See Appendix A for more information on uptake of various energy efficiency programs in California, including PACE, which had much higher uptake but is not easily comparable to SELF.)

An organization like SELF would probably be useful to many low- and moderate-income homeowners in Contra Costa Country. However, the specific service gaps that SELF filled in Florida are different from the service gaps that currently exist in Contra Costa County. In Florida in 2015, the services SELF provided were unprecedented and transformative. In California in 2021, these services would be competing with similar programs offered by REEL lenders and new programs in development by the CPUC and legislature. A new local nonprofit lender in California might need to take entirely different approaches to funding, loan structure, or outreach in order to approach SELF's success.

[40] In addition to SELF and REEL, research for this report involved examining Washington's Home Rehabilitation Loan Program (which is discussed in Delayed Repayment) as well as Kansas' How$mart and Connecticut's PosiGen. These programs' low default rates may be a feature of survivorship bias; programs with higher default rates may have gone out of business, may be less visible or famous, or may have chosen not to publish statistics.

FUNDING STRATEGIES USED BY SELF

Revolving Loan Funds

REVOLVING LOAND FUNDS:

DEFINITION	ADVANTAGES	CHALLENGES	COMBINE WITH	AVOID
Acquire a large amount of grant capital and lend it out multiple times, removing the need to seek further capital for future loans	Long-term stability Ability to charge low interest rates	High up-front costs Difficult to grow rapidly if demand increases	Almost any other feature	Can make CDFI certification less relevant

A revolving loan fund (RLF) is a large and permanent pool of loan capital. After loans are repaid, an RLF lends out the same capital to new borrowers. RLFs often use interest paid on the loans to slowly grow the size of the fund, increasing the number of potential borrowers over time. RLFs are usually formed through startup grants. Public or semi-public green banks can also start RLFs by issuing bonds or allocating budgetary resources. SELF uses an RLF, although more of their funds are leveraged credit; see "CDFI Certification and Leveraging Credit" below.

Revolving loan funds are very common for residential energy efficiency lending. For example, RLFs are discussed as a potential lending model in the ongoing CPUC proceeding on energy efficiency[41]. BayREN has considered using RLFs for providing energy efficiency loans for multifamily housing[42].

[41] CPUC Order Instituting Rulemaking 20-08-022, "Order Instituting Rulemaking to Investigate and Design Clean Energy Financing Options for Electricity and Natural Gas Customers." https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M346/K361/346361154.PDF

[42] Bay Area Regional Energy Network, "Insights from BayREN's Bay Area Multifamily Capital Advance Pilot Program and Lender Referral Service, 2014-2020."

RLFs offer significant security and stability advantages. A lending program based on an RLF is not dependent on ongoing external funding for continued operation at a constant scale. An RLF which grows through interest can operate continuously while growing, without external input.

Revolving loan funds have two primary issues. First, they are reliant on high initial grant allocations, which may be more difficult to acquire than leveraged credit. Second, RLFs can have trouble scaling up. An RLF's main vehicle for scaling up is through accrued interest, but programs serving low- and moderate-income people may have a responsibility to keep interest rates as low as possible. This means that if enrollment in an RLF-based program grows rapidly, the program may run out of funding and be unable to provide services to additional borrowers until existing loans are repaid or additional grant capital is acquired.

Because of this, revolving loan funds may be best paired with other sources of lending capital. RLFs may be most successful if they have one or more of the following characteristics:

- Commitment from a funder to provide additional grants if the program needs to expand
- Grant funding which provides additional funding over a long period of time (such as a grant for $1 million per year for 10 years), helping a new program remain stable
- Using the RLF to provide limited low-interest loans to a key target population, prioritizing them over other potential borrowers and using alternate funding sources (such as leveraged credit) for other borrowers if program uptake exceeds RLF capacity

If a potential program can access grant funding for an RLF and is confident they can put that funding to good use, there is almost no reason not to do so. Nonetheless, program designers should be aware that programs entirely reliant on RLFs and grant funding may face certain limitations, as a tradeoff for their improved long-term sustainability. Program designers should also be aware that if an RLF-based program has little uptake or does not provide the desired impacts, they will be left with a large pile of money which they need to dispose of ethically; an RLF should have a transparent plan for how the money will be repurposed should the program fail.

Creating an RLF is likely the best way to start a new loan program in Contra Costa County, possibly through applying for federal grant money from the American Jobs Act, should it pass.

CDFI Certification and Leveraging Credit

LEVERAGING CREDIT:

DEFINITION	ADVANTAGES	CHALLENGES	COMBINE WITH	AVOID
Borrow money from external lenders at low interest rates and re-loan it for energy efficiency	Easy to access funding Can lead to partnerships with other organizations	Reliance on external support Increases overall costs	Cost-reducing measures CDFI certification for increased access to credit	Delayed repayment loans: interest rates will be too high

Programs do not need to use a revolving loan fund if they focus instead on acquiring credit and re-lending it. This process is by nature specific to a program's lenders and goals; SELF uses a large pool of leveraged credit primarily from banks and faith-based institutions, but in the Bay Area, different opportunities may be available.

Overall, leveraging credit comes with increased interest rates for borrowers, as borrowers must not only cover the risk cost to the energy efficiency lender, but also the interest cost of the credit. However, energy efficiency lenders may be able to access matching funds, interest rate buydowns, loan loss reserves, or other programs which offset this cost. One potential way to access additional funds is through certification as a Community Development Financial Institution.

CDFI CERTIFICATION:

DEFINITION	ADVANTAGES	CHALLENGES	COMBINE WITH	AVOID
Certify as a CDFI through the Treasury Department; use that credential to access federal matching funds and other sources of credit	Provides access to additional funding Creates a formal commitment to serving LMI and low-credit populations	Must meet certification standards	Leveraging credit; CDFI certification should increase access	May not be important if funding is already secured

A Community Development Financial Institution (CDFI) is an institution which has been granted CDFI certification by the Treasury Department. To qualify for this certification, an institution must be a non-governmental financing institution which promotes community development, provides financial and educational services, and serves and maintains accountability to defined target markets (including low- and moderate-income borrowers and financially underserved populations). CDFI certification opens up an organization's access to the CDFI fund, a Treasury Department program which provides grants, loans, and technical assistance to CDFIs. The CDFI fund is not intended to be the primary source of capital for CDFIs; most CDFI grants and loans must be matched by external sources[43].

CDFI certification does not automatically grant access to additional capital. Instead, CDFI certification is a way for an organization to make a formal commitment to serve low- and moderate-income borrowers and financially underserved populations; that commitment and can then help in acquiring credit from impact lenders. SELF attributes some of their ability to access credit to their CDFI certification.
An energy efficiency lender focused on providing service to low- and moderate-income homeowners could benefit from CDFI certification and use it to gain access to additional funding from the CDFI Fund and impact lenders. However, CDFI certification is in no way necessary for a successful program. Programs which are funded through support from local governments, utility ratepayer funds, or federal stimulus grants may have little to gain from CDFI certification. Programs which focus on leveraging external credit and on acquiring matching funds from multiple sources are much more likely to gain a benefit from CDFI certification.

It may also be possible for a new energy efficiency lender to partner with an existing CDFI rather than pursue CDFI certification itself. Most CDFIs in California are focused on lending to businesses and supporting home purchases[44]. It is more unusual for CDFIs to provide smaller project loans to individual homeowners, and many CDFIs may lack the financial expertise necessary to support small loans for individual borrowers. New programs therefore may not be able to rely on partnership with existing CDFIs in order to access CDFI funds.

Leveraging credit may be an effective strategy for starting a program, but impact lenders may be less likely to lend to a program which does not already have funding. CDFI certification is only possible once a lender already exists, so CDFI-based funding will not help start a new program unless a program works with an existing CDFI.

[43] U.S. Department of the Treasury, Community Development Financial Institutions Fund website. Accessed May 4, 2021. https://www.cdfifund.gov/
[44] CDFI Coalition, CDFIs In California Fact Sheet. http://www.cdfi.org/wp-content/uploads/2015/03/California.pdf

Crowdfunded Lending

CROWDFUNDED LENDING:				
DEFINITION	**ADVANTAGES**	**CHALLENGES**	**COMBINE WITH**	**AVOID**
Partner with a crowdfunded lending platform like KIVA to access zero-cost low-interest loans for certain populations	Access to zero-cost capital	Limitations on amount of capital Potential for discrimination Unjust shifting of burdens	Non-standard eligibility, to increase access Small loan sizes Other sources of funding	Delayed repayment: too long a repayment timescale

SELF provides some targeted low-interest loans for specific disadvantaged populations. One of these loans is provided through KIVA, a crowdfunded microloan program. KIVA charges no interest and bears 100% of the loss risk of these loans; SELF charges interest and processing fees to cover their own expenses for handling the loan.

Any new loan program could attempt to become a KIVA field partner, accessing what is effectively zero-cost zero-risk leveraged credit. This partnership may not be appropriate for every program. KIVA loans place access burdens directly on borrowers, requiring individuals to advocate for themselves on the crowdfunding platform and prove themselves as deserving of a loan. Discrimination on the part of crowdfunders may lead to unequal outcomes, with people who are not deemed suitably "inspirational" potentially facing exclusion, and the possibility of crowdfunder bias leading to racial, gender-based, or location-based discrimination[45]. KIVA also places the risk for these loans onto external parties who are willing to accept that risk. This may or may not match a program's goals for how to facilitate and promote equity.

Crowdfunded lending is likely not an appropriate way to start a new program, due to low volume, partnership requirements, and equity concerns. Crowdfunded lending may instead be a useful strategy for an established program to acquire extra funding for a specific borrower demographic.

[45] Christina Jenq, Jessica Pan, and Walter Theseira (2015). "Beauty, weight, and skin color in charitable giving." Journal of Economic Behavior & Organization, November 2015. https://www.sciencedirect.com/science/article/pii/S0167268115001675

Unsecured loans

UNSECURED LOANS

DEFINITION	ADVANTAGES	CHALLENGES	COMBINE WITH	AVOID
No requirement for collateral, except for possible small cash guarantees; borrowers are not at risk of losing any property	Protects borrowers from the worst negative outcomes	Higher risk of losses to the loan program	Absolutely crucial for lending to low- and moderate-income populations	Delayed repayment may mitigate the harm from securing loans, but unsecured loans are still safer

Across the board, stakeholders and researchers agree that secured loans for energy efficiency are almost always inappropriate for LMI borrowers, especially loans secured by the property being improved. The risk of property loss and the damage caused when property is seized are simply too harmful to borrowers.

Unsecured lending comes with its own costs. The absence of collateral can drive up interest rates, as lenders must rely on interest rather than collateral to cover losses. Energy efficiency loans can offset this by accessing loan-loss reserves, such as those accessible through the REEL program, or by accessing interest rate buydowns or other sources of external funding.

Non-standard eligibility requirements

NON-STANDARD ELIGIBILITY REQUIREMENTS

DEFINITION	ADVANTAGES	CHALLENGES	COMBINE WITH	AVOID
Use detailed documentation of income and expenses to determine loan eligibility and risk; do not require a minimum credit score or use standard credit and debt-to-income eligibility methods	May provide access to financially excluded households	Places an administrative burden on applicants Requires more complex evaluation of risk Increases the possibility of predatory inclusion May increase risk of defaults	Partnerships to subsidize loans for low-access households Application support and service hubs Energy audits to provide clear estimates of savings	Small loans; administrative burdens may be too high Secured loans; compounded risk of predatory inclusion and negative outcomes

SELF uses detailed information about a potential lender's expenses and income in order to grant loans. They require pay stubs or proof of income and documentation of existing expenses which must demonstrate that borrowers have surplus income which they could use to pay off a loan. They use a rigorous process for evaluating the security of peoples' incomes, the accuracy of their documented expenses, and other information. This evaluation process is proprietary.

Applicants who are not demonstrated eligible may be provided opportunities to prove eligibility, including finding co-signers and providing a large up-front cash payment of 5-20% of the loan size to demonstrate their ability to pay loan expenses. SELF's application acceptance rate is currently 60-70%. While SELF does not publish aggregate credit score information for their borrowers, one SELF officer stated that 60% of their borrowers have a credit score less than 680 and 14% have a credit score less than 500.

Traditional methods for evaluating loan eligibility rely on credit scores and debt-to-income (DTI) ratios, and are generally considered to be accurately predictive of an individual's likelihood of repayment. It is not entirely clear how SELF's eligibility methods differ from traditional methods, but it seems that they are able to identify some households who have low eligibility under traditional methods but are still able and likely to repay these loans. SELF's success in providing services to these

households may also have to do with their supportive relationships with borrowers, their allowances for flexibility in loan repayment, and their cash guarantee requirements, which may screen out riskier borrowers.

Non-standard eligibility requirements may be difficult to implement, as a wide variety of factors may impact the stability of a household's income and expenses. Evaluating applicants' finances in detail also places a substantial administrative burden on applicants. Even with clear documentation of income and expenses, a large purpose of energy efficiency installations is to change an household's expenses, and that change in utility bills is difficult to estimate accurately.

Programs which deliberately provide services to individuals who have lower credit scores and higher DTI may also face higher levels of delinquency and default. These programs also run the risk of lending to individuals for whom additional debt creates significant negative financial and emotional impacts.

Non-standard eligibility requirements might allow a new program in Contra Costa County to fill important service gaps. In California, people with credit scores under 580 cannot currently access loans through GoGreen Financing. A program like SELF with no minimum credit score might allow some of these low-credit individuals to access financing.

A program which uses non-standard eligibility should highlight the following decisions and concerns when designing a loan program:

- ensuring that applications are easy to submit, even if they require a lot of documentation, by allowing different forms of documentation and providing active support to potential applicants
- ensuring that the new eligibility process is actually providing access to people who would not otherwise

CREDIT SCORES

Credit scores are single numbers which attempt to encapsulate a person's credit-worthiness and their likelihood of repaying new loans. Credit scores are usually influenced by current debt and past debt payment history, but factor in many other aspects of an person's financial behavior.

FICO Credit scores are divided into categories, from Exceptional (800-850) to Very Poor (300-579); 11% of U.S. consumers have Very Poor credit.

Poor credit scores can significantly reduce access to financial services, including home loans, car loans, phone plans, and insurance. People facing higher interest rates and higher costs for financial services may be even more likely to miss payments due to high costs, creating negative feedback which can trap people in poor credit.

Numerous studies have found substantial racial disparities in credit scores. Rather than providing a race-neutral way to evaluate credit-worthiness, credit scores tend to increase racial disparities in financial access and entrench wealth inequalities, providing cover for discrimination against Black and Hispanic households[46]. Credit scores also provide a justification for providing more expensive financial services specifically to those most vulnerable to financial exploitation.

Loan programs using credit scores to evaluate credit-worthiness therefore run some significant risk of reinforcing discrimination and excluding populations most in need of financial services.

gain it, and is not just replicating existing exclusions based on income levels and credit scores[46]

- monitoring loan performance and adjusting the eligibility calculation constantly

A new loan program in Contra Costa County which wishes to expand access to loans should seriously consider using non-standard eligibility metrics to reach households who do not already have access to loans through GoGreen Financing. However, such a program may be difficult to implement, and difficult to justify, due to its risk of placing debt burdens on households which would be negatively impacted by debt.

Contractor network

CONTRACTOR NETWORK				
DEFINITION	**ADVANTAGES**	**CHALLENGES**	**COMBINE WITH**	**AVOID**
Require that financed work be done by a verified contractor with training and quality control	Provide higher-quality services to borrowers Reduce contractor fraud	Requires buy-in from contractors Prevents borrowers from doing their own work	Everything; contractor networks are an industry standard Partnerships with REEL or BayREN to make use of their existing contractor networks	Possibly unnecessary for small loans for appliances

SELF has a network of verified contractors and requires that all work be done through a contracting partner. All energy efficiency programs with public oversight in California use contractor networks, including WAP, ESA, and REEL. These contractor networks vary in how they are organized, how contractors are registered, and how quality control is performed, but all these programs make some effort to ensure that contractors are tracked, verified, trained, and accountable in the event of error. There is wide industry agreement that contractor networks and verifications are crucial to ensuring

[46] Racial Justice & Equal Economic Opportunity Project, National Consumer Law Center (2016). "Past Imperfect: How Credit Scores and Other Analytics 'Bake In' and Perpetuate Past Discrimination." http://www.nclc.org/images/pdf/credit_discrimination/Past_Imperfect050616.pdf

that participants receive quality service and are protected from contractor fraud, especially when serving LMI households.

Contractor networks do impose several costs. First, contractors must enroll, which they may not be interested in doing. They may desire finder's fees for referring potential clients or freedom to work outside the limits imposed by programs. Contractors may underestimate demand for energy efficiency or the availability of financing[30]. Some households may also wish to perform necessary work themselves, and contractor network requirements prevent that. Effective quality control and contractor oversight also create significant costs, as contractor networks must perform regular independent quality checks and impose penalties on contractors who are causing issues.

These costs are unavoidable if a program wishes to protect participants. Contractors simply have too much power over most program participants, and it is too easy for them to make false claims about energy efficiency, suggest unnecessary work, or perform poor work, if they are not organized, trained, and made accountable. Ideally, a program simply makes it easy enough to enroll in the contractor network that contractors can join as needed, while maintaining enough training, accountability, and controls to prevent abuse.

Energy efficiency programs can also provide large benefits to contractors in the network. Ideally, financing programs allow energy efficiency renovations to occur which would otherwise not be possible, increasing available work for contractors. Network enrollment trainings can help provide additional informational resources to contractors and help them provide better service. When potential borrowers approach lenders directly, lenders can prioritize referrals so as to promote equity, including prioritizing local contractors, smaller businesses, businesses with job training programs, and businesses owned by women and people of color.

Many energy efficiency contractor networks already exist in California, including through REEL and BayREN. A new program does not have to be created from the ground up, and a new program enrolled in REEL or partnered with BayREN would already have access to a contractor network. Even if a new program does wish to form an independent contractor network, program designers have access to a wealth of knowledge and experience in BayREN administrators, REEL participants, and county WAP administrators.

Funding prework repairs and non-energy work

ALLOWING PREWORK REPAIRS:

DEFINITION	ADVANTAGES	CHALLENGES	COMBINE WITH	AVOID
Allow the program to finance repairs that are required before energy efficiency work can proceed	Fills a major access gap Supports equity Increases health and safety co-benefits	Projects with prework repairs usually do not provide savings that outweigh costs	Everything; prework repairs are important for providing access Delayed repayment loans	Programs which mandate that energy savings outweigh costs may not be able to provide prework repairs May be less important for small loans for appliances and programs for renters

CARVEOUTS FOR NON-ENERGY WORK:

DEFINITION	ADVANTAGES	CHALLENGES	COMBINE WITH	AVOID
Allow some fraction of funds to be used on general renovations and repairs like repainting and landscaping	Gives borrowers more agency and freedom Encourages more borrowers to use energy efficiency programs	Makes quality control more challenging Projects may require multiple contractors Projects with non-energy work usually do not provide savings that outweigh costs	Delayed repayment loans, which remove the reliance on savings REEL enrollment	Unnecessary for small loans for appliances Programs which mandate that energy savings outweigh costs should not allow carveouts

REQUIRING ENERGY AUDITS:

DEFINITION	ADVANTAGES	CHALLENGES	COMBINE WITH	AVOID
Require a trained auditor to assess a home's energy efficiency needs before work can be performed	Helps homeowners identify needs and predict savings Increases cost-effectiveness Helps prevent fraud	Increases costs Creates an additional administrative and time barrier Not useful for households making specific repairs	Partnerships with BayREN Non-standard eligibility; helps ensure extra income from energy bill reductions	Small loans; costs will be prohibitive, and full energy audits may not be helpful for appliance replacements

SELF's core loans allow for some funds to be used for non-energy-efficiency remodeling or retrofitting. Non-EE work is also used by other programs, including GoGreen Financing in California, which allows for up to 30% of loan funds to be used on non-qualifying projects.

With a carveout for non-energy work, borrowers can use an energy efficiency loan when they are performing general repairs or renovations. Without a carveout, a borrower might have to take out multiple loans from different sources for a single large project. For programs with strict cost-effectiveness requirements or strict lists of eligible installations, carveouts can be the only way to allow for necessary prework repairs. Programs which count prework repairs as necessary energy efficiency work may still employ carveouts to allow additional use flexibility.

Many borrowers (possibly a large majority[30]) do not make use of these carveouts. Borrowers may be focusing on energy efficiency, and performing non-energy work may require additional planning. Nonetheless, many program designers agree that creating an opportunity for non-EE work to be performed is crucial for ensuring that a program is actually usable by low- and moderate-income borrowers. Allowing carveouts may also help contractors promote loan programs and may encourage households to include energy efficiency in larger projects so that they can access energy efficiency financing.

Allowing for non-EE work may conflict with best practices around quality control, such as using energy audits to define eligible installations. Energy audits and strict installation eligibility requirements can help prevent contractor fraud and exploitation[22]. SELF originally required the use of energy audits for these reasons, but stopped mandating them after discovering they were posing a

barrier to customers in need of rapid repairs, and were not helping certain customers who were pursuing smaller projects. SELF still recommends energy audits and provides referrals.

Regardless of a program's approach to non-energy work, programs which intend to support low- and moderate-income homeowners must provide some way for households to finance prework repairs. Necessary prework repairs are a primary reason for exclusion from WAP and ESA, and a major barrier to energy efficiency for LMI homeowners in general. A program which does not provide a cheap and efficient way for borrowers to perform prework repairs will not be equitable and will not have the desired outcomes.

A program's approach to energy audits, non-energy carveouts, and eligible work restrictions should depend on its priorities. Programs which focus specifically on reducing utility bills may want to mandate energy audits and limit carveouts, while providing funding for necessary prework. Programs which focus on serving lowest-income and lowest-credit borrowers through non-standard eligibility may also wish to mandate energy audits so as to provide useful estimates of utility bill savings. Programs which are intended more to give LMI homeowners more agency and help build credit may wish to be more flexible. Either way, energy audits and cost-effectiveness estimates of proposed work should be clearly available and provided to any interested potential borrowers.

Energy auditing and efficiency estimations may be a potential opportunity to coordinate with other energy programs, like BayREN. Carveout opportunities may also provide a potential opportunity to coordinate with other government programs, such as public health remediation programs and emergency relief programs.

LOAN LOSS RESERVES AND INTEREST RATE BUYDOWNS

A loan loss reserve (LLR) is an account of money set aside to partially cover losses on loans which default. A lender can create their own LLR as part of the process of managing their own loans, but in the context of energy efficiency, LLRs are usually created by external entities who wish to subsidize a loan program. By setting aside money to partially cover a loan program's losses, an external entity can allow a lender to offer loans to individuals who would normally be deemed too risky to lend to. LLRs can also allow a lender to offer lower interest rates or longer terms, as they are less reliant on interest to cover their expenses. LLRs usually do not cover 100% of losses, as that can remove a lender's incentive to lend responsibly. In California, the REEL program provides LLRs to participating lenders.

An interest rate buydown (IRB) is money paid specifically to lower interest rates. In effect, it is a subsidy that is realized as a reduction in interest rates rather than as a direct partial payment of the loan. It is another, more direct way for external entities to allow lenders to provide lower interest rates. Loan subsidies in general are often called buydowns, with interest rate buydowns being a particularly common type of buydown.

Subsidizing interest rates for lowest-access borrowers

SUBSIDIZING INTEREST RATES FOR LOWEST-ACCESS BORROWERS:

DEFINITION	ADVANTAGES	CHALLENGES	COMBINE WITH	AVOID
Use specific funding partners, buydowns, loan loss reserves, or other methods to try to drive down interest rates for lowest-access borrowers	Provides the best service to the people who need it most	Costly	Non-standard eligibility, to provide access to those borrowers Crowdfunded lending	Using moderate-income homeowners as a source of revenue

SELF provides some low-interest loans for specific disadvantaged populations, such as those provided to women-headed-households and veterans with poor credit through KIVA. This leads to an inverted interest structure where some of the lowest-credit lowest-financial-access borrowers actually receive lower interest rates and more favorable loan terms, compared to higher credit borrowers.

An inverted interest structure is only possible if a program can provide extra funding for lowest-income and lowest-credit borrowers. Programs should not charge higher interest rates to higher-income or higher-credit borrowers to cover potential losses, as this is inequitable, especially for programs which focus on LMI households; moderate-income borrowers are not an appropriate base from which to raise revenue for subsidizing energy efficiency for lowest-income borrowers. Other methods may include leveraging particularly low-interest loans from partners with interests in supporting particular demographics (such as SELF's HALO accessibility loans) as well as accessing grants for limited interest-rate buydowns or loan-loss reserves. For example, a new program enrolled in REEL might be able to use the loan loss reserve to lower interest rates for lowest-access borrowers.

An inverted interest rate structure increases accessibility and financial inclusion for the most vulnerable borrowers, at the expense of more complex loan structures, more difficult fundraising, or shifted equity concerns. However, given that GoGreen Financing is not currently accessible to very-low-credit households, this is likely a useful strategy to pursue in Contra Costa County, filling in an existing gap in service provision.

OTHER LOAN PROGRAM FEATURES

Delayed repayment

DELAYED REPAYMENT:

DEFINITION	ADVANTAGES	CHALLENGES	COMBINE WITH	AVOID
Delay all requirements of loan repayment until sale of property	Shifts the financial burden from energy savings to property value Makes costly prework repairs less problematic	Requires much more capital at any given time Requires lower interest rates May rely on secured loans	Pre-work focused loans Revolving loan funds, to lower interest rates and prevent external obligations	Small loans Crowdfunded loans Leveraged credit Doesn't work for renters

The Home Rehabilitation Loan Program for Rural Low-Income Households (HRLP) in Washington is a public loan program operated by the Washington State Department of Commerce. which allows borrowers to delay repayment of the loan until they sell or transfer ownership of their home. The purpose of this program is to make home rehabilitation easier by making repayment occur during a time when borrowers are likely to have extra cash[47].

The HRLP was created through ESB 5647 in 2017. As of 2020, the program has been funded to $10 million, and would require an additional $90 million to make the program self-sustaining[48]. This is a very large amount of capital, more than 20 times the size of SELF's revolving loan fund. Such a massive amount of capital is necessary because the revolving time for these loans is substantially longer than for other funds. While a standard energy-efficiency loan might usually have a 3-10 year term, a loan which is deferred until the home is sold might not be paid off for decades. A delayed repayment loan fund will therefore have a much larger amount of capital lent out at any given time, even with an equal number of borrowers per year.

[47] Washington State Department of Commerce, New Home Rehabilitation Loan Program (HRLP) for Rural Low-Income Households website. Accessed May 5, 2020. https://www.commerce.wa.gov/growing-the-economy/energy/weatherization-and-energy-efficiency/rural-rehab/

[48] Amanda Raines, Washington State Department of Energy, Home Rehabilitation Loan Program presentation, August 2020. https://www.naseo.org/Data/Sites/1/naseo-hrlp-a-rains.pdf

HRLP primarily has provided roofs, septic systems, and foundation issues, often providing them to homeowners who have been deferred from weatherization assistance due to necessary prework repairs. HRLP has also occasionally directly provided energy efficiency measures. HRLP's interest rates are very low and are based solely on the Consumer Price Index, a measure of inflation. In 2020, this was 2.3%; in 2021, new loans will have an interest rate of 1.4%. This is appropriate for a long-term loan; a normal interest rate of 5% on a 20-year term would result in an additional 160% of the initial loan value being charged in interest; a 2% interest rate results only in an addition 40% of the initial loan value. Fees are up to 7%.

A delayed repayment model dramatically increases the accessibility of any loan. By allowing borrowers to defer repayment if needed, the program becomes open to households with low disposable incomes and who might be less certain to be approved under most ability-to-pay metrics. Of course, this does come with costs; delayed repayment can make it too easy for borrowers to accumulate and maintain a large level of debt, which may limit their access to other financial services; it also reduces the amount of money they receive when they sell their house.

Delayed repayment loans require a high initial investment, and the required low interest rates and long timescales make it difficult to use leveraged credit to provide these loans, meaning delayed repayment programs may only be sustainable through very large grants and revolving loan funds. Administrative costs may be slightly higher, as the program may wish to create liens on properties, and may need to track borrowers over longer periods of time. In order to function equitably, loans must have extremely low interest rates, meaning a loan fund would grow fairly slowly. However, delayed repayment loans may also have particularly low default rates.

Despite these challenges, deferred-payment loans may still be viable for a smaller lender. Energy efficiency loan sizes may be smaller than HRLP's loans, which begin at a minimum of $11,000. Smaller loan sizes mean loans may be more likely to be repaid quickly, and the loan fund may not need to be so extraordinarily large. A lender might also only offer deferred repayment in certain cases, such as for loans that require costly prework repairs, minimizing extra costs.

FORGIVING LOANS

Several of the people interviewed for this report referenced informal policies adopted by several loan programs, including HRLP, of simply forgiving loans if borrowers cannot repay, despite the fact that these loans are secured and HRLP could seize the property of defaulters.

Loan programs are necessarily somewhat tight-lipped about these policies, as they may decrease borrowers' incentive to repay. Certain funders may also dislike the idea of broad loan forgiveness policies, whether or not that impacts a programs' finances or not. Loan forgiveness policies may also affect lenders' access to loan loss reserves. And loan forgiveness is costly.

Despite these issues, adopting formal or informal loan forgiveness policies can be a powerful strategy for reducing the risks of negative impacts to borrowers, especially for secured loans. If default rates are fairly low, these costs may not actually pose a substantial issue to program finances, no more than a lowered interest rate or administrative costs.

Deferred payment loans are unlikely to be appropriate for very small loans and installment replacement options. They cannot be used to help renters. They may be most effective for programs like HRLP which are not only for energy efficiency, but also provide funding for general home repair and maintenance.

Small loans for appliances

SMALL LOANS FOR APPLIANCES:

DEFINITION	ADVANTAGES	CHALLENGES	COMBINE WITH	AVOID
Offer small loans as an alternative to installment plans for appliances	Fills a service gap Helps prevent common high-interest debt Can support renters	High processing costs Potentially more difficult to spread awareness	Cost-lowering measures Crowdfunded loans, if possible	Secured loans Energy audits and contractor networks may not be necessary

Energy efficiency lenders have an opportunity to compete with appliance installment plans, providing better terms on purchases of a few hundred to a thousand dollars. Many smaller energy efficiency upgrades are not very expensive. While costs for HVAC systems, water heaters, insulation, or solar installations for an entire home can easily run into the thousands of dollars, other common measures like EnergyStar appliances, smart thermostats, and efficient lighting often cost only a few hundred dollars. Many households might need or want smaller installations without being able to afford the up-front cost. For appliances in particular, people might purchase them on an installment plan. While terms vary, interest rates on these installment plans are high, often as high as 25%[49]. This provides an opportunity for EE lenders to focus on creating a way for borrowers to access loans of less than $1,000 with favorable interest rates.

Administrative costs pose a substantial barrier to small loan provision. While processing may be less costly for small loans, a 3% processing fee on a loan of $10,000 provides $300 to cover administrative costs, while a 3% processing fee on a loan of $500 would provide just $15.

[49] Best Buy, "Financing Your Purchase at Best Buy" website. Accessed May 5, 2021. https://www.bestbuy.com/site/financing-rewards/learn-about-best-buy-financing/pcmcat1476112234971.c?id=pcmcat1476112234971

Some platforms, like KIVA and SoLo, provide microloans for general uses. These platforms rely on crowdfunding to provide loan funds, transferring the risk of default on to external parties and using that as a way to recoup processing costs; they also shift some costs onto lenders, such as evaluating an individual's need and repayment probabilities. However, verified partners for these organizations still have processing costs, and borrowers may be unlikely to wish to go through a substantial administering process of a crowdfunding campaign just to buy a basic appliance. SELF does not offer very small loans (below $1,000) through their KIVA program. Despite these challenges, the low cost of crowdfunded loans makes them appealing for very small loans, if administrative barriers can be addressed.

Small EE loans would also face advertising and uptake challenges. A person trying to buy a new dishwasher may simply order one from a vendor without speaking to contractors in advance, seeking out financing information, or thinking of that process as something a third party might get involved with. Installation plans for appliances are incredibly common, meaning that a new program has significant competition and may face challenges gaining traction even if it offers substantially improved terms.

Despite these serious challenges, very small energy efficiency loans have the potential to have a very large positive impact. Credit card debt burdens are higher among low- and moderate-income people, and low- and moderate-income people may rely installment plans and credit card debt to access appliances and repairs. Common private installment plans also offer none of the additional informational and connective resources that an energy efficiency lender might be able to provide. While it is difficult to estimate exactly the impact that a small lending program could make, every person who acquires a new appliance with a 5% or 10% interest rate rather than a 25% interest rate would be a success.

Small loans have both serious implementation challenges, along with the potential for huge uptake and large benefits to LMI households, including renters. Very small loans might require additional grant funding to offset administrative costs, or partnerships with existing vendors to get the word out. While small loans may simply be too costly to provide for some lenders, any new lender in California should seriously consider trying to provide very small loans.

Coordinating applications or requirements for multiple programs

COORDINATING APPLICATIONS OR REQUIREMENTS

DEFINITION	ADVANTAGES	CHALLENGES	COMBINE WITH	AVOID
Support loan applicants in accessing other services, including direct provision programs and rebates	Leverage programs that already exists to help borrowers Rebates can help alleviate borrowers' financing costs	Requires substantial administrative work Ethical challenges for the most efficient methods	Any programs, especially those focused on low-income lenders	Making things overcomplicated for applicants Relying on rebates to make loan costs tolerable

Households performing in energy efficiency renovations have access to many small rebates, including tax incentives, small cash rebates through BayREN and PG&E, and benefits from certain vendors. (See Appendix A for slightly more detail). Each energy efficiency program or rebate has its own application criteria, its own eligible purchases or programs, and its own procedures. It might technically be feasible for almost every low- or moderate-income household who gets an energy efficiency loan to also acquire a rebate from BayREN and a federal tax credit. But many homeowners may not even know about these programs, and even if they do, they may not have the time necessary to complete multiple applications and meet documentation requirements. Accessing every last drop of available funding is simply not a realistic expectation, especially for low- and moderate-income households with time and resource limitations.

The existence of these rebates and smaller funding sources creates an opportunity for new programs to support borrowers in accessing additional funding. In an extreme case, a lender could provide a single point of contact for a borrower, allowing them to submit only one set of paperwork, and filing applications to other programs on their behalf. More realistically, a program might design its application and work-eligibility criteria to ensure cross-compatibility, and provide information about other programs to applicants.

Focusing on program cross-compatibility could lead to issues. If a program assumes that its customers will access rebates or other services, program staff might begin to incorporate that assumption into ability-to-pay estimates or interest rate calculations, and use external services as an excuse for unsafe

inclusion or higher interest rates. Programs might risk over-promising external benefits to borrowers or overburdening other programs. Trying to coordinate applications might make applications more complex than necessary. Providing general application support and advising households is fundamentally a different task from providing loans, and those two tasks carry conflicts of interest.

While new loan programs should carefully consider how their programs interact with other energy efficiency programs, and should attempt to increase access for all customers and potential applicants whenever possible, cross-coordination requires care and attention to avoid negative outcomes.

PROGRAM ACCESSIBILITY

A program can only be successful if people use it. Actually reaching potential borrowers requires commitments to accessibility, transparency, and outreach. Aspects of these requirements are discussed in more detail in the sections below.

Easy application process

Applying for the program should be as easy as possible. Each barrier in the application will discourage some potential applicants from completing their application and accessing the program's services. Easy applications should aim to be **straightforward**, **concise**, **flexible**, **supportive**, and **protective of applicants**, and to have **minimally burdensome requirements** for completion. These goals are occasionally in conflict with each other, and are often in conflict with the goal of a loan program to thoroughly evaluate an applicant's needs and ability to repay a loan.

Straightforward applications are easy for potential applicants to evaluate before they begin the application process, and easy to complete. For an application to be straightforward, a potential applicant must be able to look at informational material and quickly understand whether or not they are likely to be eligible for the program, what documents they will need to complete the application, and when they should expect to hear back from the program. Applications which are not straightforward will result in applicants being misled, frustrated, and confused, and in applications being started but not completed because applicants didn't understand what was required.

Concise applications are short. They don't require a huge number of documents and they don't require the applicant to perform complicated calculations (or any calculations at all). If an application process is concise, fewer potential applicants will drop out of the process.

Flexible applications allow for people in a variety of circumstances to finish the application. A flexible application could be completed online, by phone, at a program office, or through physical mail. Flexible applications ensure that there are several different ways to qualify, demonstrate income, and demonstrate expenses. Flexible applications should make it easier for people with nontraditional sources of income or issues recovering documentation to complete applications. Care should be taken to ensure that providing additional pathways for proving eligibility does not make applications substantially more confusing to complete.

Supportive applications provide resources to help potential applicants complete their application. These include support staff available online or by phone and regularly updated "frequently asked questions" information. The exact support process will vary depending on program factors, but at a minimum, applicants should have a clear pathway to ask specific questions about the process and outcomes and receive an answer.

Applications are **protective of applicants** when they don't force applicants to make specific commitments before being approved, and when they don't shift burdens of evaluating contractors or defining scopes of work onto applicants. For example, applicants should be able to update cost estimates after approval, as they may want to spend more time with contractors and defining scope of work after they know they will be able to access funds.

Applications have **minimally burdensome requirements** when they make a strong effort to avoid redundancy in the information gathered, allow the application to be completed using easily-accessed documents, and continually update the application process to ensure that it is as easy as possible. Programs using non-standard eligibility may find this challenging, especially early on, but will eventually be able to streamline the application as the program learns more about the people that use it and the barriers that applicants face.

No application process is perfect. Most loans made through GoGreen Financing have applications which are incredibly fast, because they rely mostly on credit checks. This is easy in the sense that it requires minimal work on the part of the applicant, but it also excludes many potential borrowers. The Solar and Energy Loan Fund's applications focus instead on maximizing eligibility, with complex applications and frequent requirements for supplemental documentation. SELF addresses this by supporting applicants directly. Any program will have to choose exactly the application process that works best for them.

Easy to gather information about the program

Public knowledge about a program's existence is critical to program success. The importance of active promotion varies with program characteristics, but any program should have a clear and regularly updated outreach strategy. Depending on the specific qualities of the program and how it's expected to be used, this could take different forms:

- Mailed information to all homeowners, homeowners in LMI census tracts, homeowners with known access to other social services, or other specific homeowner groups
- Referrals from other services and service hubs, including after weatherization or inspection, or at sites like libraries, community centers, and notaries
- Coordination with contractors to ensure that contractors know to refer potential participants to the program
- Coordination with community organizations to identify specific needs for support and ways to distribute information

- Display of information in public fora, such as on city/county/provider websites and on billboards or bulletins

Programs also must provide clear pathways for potential clients to gather additional information, once they have learned about the program. A program should also ensure that current outreach material is regularly reviewed and updated to ensure outdated resources aren't still in circulation.

Fast processing of applications

Many interviewees highlighted the importance of providing services quickly. Energy efficiency services are often needed in response to specific events, such as an appliance breaking or an extreme weather event. Households in these circumstances need service quickly, and are much more likely to participate in an energy efficiency program if they are able to get financing within a short period of time. Both REEL and SELF aim for 24-hour verification, although SELF occasionally requires follow-up documentation for many of their loans.

Program transparency and tracking metrics

Programs should also make a clear commitment to transparency. Programs should track outcomes, including borrower demographics, loan characteristics, installations, and loan outcomes, and make aggregated information available online, along with information about funding sources and loan profiles. The REEL program provides a good example of this kind of transparency, with monthly data summaries and quarterly reports available on their website[50].

Transparency of this form is important for a few different reasons. Outcome information helps clients evaluate the program and the risks of enrolling, and transparency can help build trust. Aggregated outcome information is also useful for potential lenders and partners. And programs which commit to publishing statistics will find it harder to ignore undesired outcomes and face an additional incentive to constantly make modifications and improve their services.

Programs may want to avoid setting narrow definitions for tracked metrics or narrow metrics-based goals, as these can distort priorities and prevent flexibility. Instead, programs should make a commitment to regularly examining tracked metrics to ensure they match program goals, and update their strategy accordingly.

[50] California State Treasurer, CHEEF Reports and Additional Materials website. Accessed May 8, 2021. https://www.treasurer.ca.gov/caeatfa/cheef/cheef-reports-and-additional-materials.asp

Payment flexibility

Low- and moderate-income homeowners are financially vulnerable to economic and personal shocks. Even people with steady incomes and careful finances can easily lose access to their income or incur additional expenses. For this reason, loan programs serving low- and moderate-income borrowers may wish to prioritize repayment flexibility to ensure that borrowers facing difficult circumstances are not heavily penalized[8].

Strategies for payment flexibility include:

- allowing borrowers to apply for a temporary payment deferral of a few months, and potentially allowing customers one payment deferral without needing to apply
- ensuring that late payments are not heavily penalized, and that noncompliance penalties such as late fees are never treated as a revenue stream
- allowing people who face a change in income or expenses to refinance to reduce their payment burden

Informal flexibility can also be useful. Many researchers and program administrators described unofficial processes for payment flexibility and loan forgiveness which allow customers to bend the official rules when needed. This can help mitigate the most negative outcomes while allowing programs to maintain formal disincentives for nonpayment. These practices bring some risks, including heightened risks of discrimination in applying informal rules. For more discussion of informal practices, see sidebar “Forgiving Loans” on page 42.

Complaints processes and accountability

Any new program should have a robust complaints process. Borrowers should be able to check a program website or their program materials and quickly identify a way to file a complaint, request an inspection, or request additional service. Ideally, there should be at least two ways to file a complaint (an online form, by email, by physical mail, and/or by phone) as it can be difficult to notice when a complaints process fails due to a technical or procedural glitch. Borrowers who file a complaint should receive help resolving their problem, such as accessing additional inspections, corrective work by the contractor, and possible refunds in case of equipment failures.

Complaints processes may not seem important, especially for lending programs that act mostly through contractors or by coordinating resources for borrowers without directly interfacing with them. Nonetheless, these programs should still have complaints processes. Without such a process, it will be incredibly difficult to identify and address unforeseen issues that borrowers may face.

When complaints are identified and confirmed, borrowers should have resources to address their issues. When possible, the program should be proactive about addressing complaints; if several

borrowers have issues with a particular contractor or a particular piece of equipment, it may be worth contacting other borrowers who used the same contractor and equipment to ensure there have not been other problems.

OTHER STRATEGIES FOR ENERGY EFFICIENCY

Loans are not the only way to provide energy efficiency to low- and moderate-income households. While examining and comparing non-loan strategies was beyond the scope of this report, here are some key strategies that might help fill some of the same access gaps this report discusses.

Increasing uptake of existing REEL loans

Contra Costa County already has access to a program for unsecured lending to homeowners, at low interest rates: the Residential Energy Efficiency Loans available from First U.S. Community Credit Union, Matadors Credit Union, and California Coast Credit Union. (For details, see Appendix A.) These loans already meet many of the important requirements for safe lending to LMI homeowners discussed in this report: they are unsecured, subsidized, operate through a contractor network, provide funding for non-energy work, and have easy and fast applications. These credit unions also appear to have capacity and funds which would allow for a large increase in uptake without straining program resources; REEL is actively working to increase uptake, as are all three credit unions.

Any new loan program would therefore risk duplicating effort without providing any substantial new benefit. A new program could devote resources to borrower outreach, contractor outreach, seeking additional funding and buydowns, and coordinating partnerships, so as to provide a better service. But those resources could be devoted to the exact same goals to support and improve existing REEL loans instead, without having to create and fund a new loan program. A new independent loan program like SELF might also face challenges raising funding, as they would be providing a service that already exists.

REEL does not serve everyone. In particular, households with credit scores below 580 cannot access REEL loans. A new independent lender might focus specifically on lending to households with very low credit scores or low incomes, possibly through providing deferred-repayment loans for projects which are otherwise too expensive or risky for households to finance. However, people not eligible for REEL may be specifically those people who are most costly to serve with loans (due to high default risks) as well as being most likely to be harmed by additional debt.

Increasing funding and support for WAP

The Weatherization Assistance Program is already oversubscribed in Contra Costa County and in most counties in the state. However, the American Jobs Plan includes additional funding for weatherization services[18]. While bill text is not yet publicly available, and the bill may not pass, Contra Costa County may wish to track this bill's progress and be prepared to try to access additional weatherization funding, increasing energy efficiency provision to low-income households. This effort could be paired with outreach to households experiencing weatherization deferral to help them finance repairs through REEL if they desire to do so.

Expanding public health measures

The Contra Costa County Asthma Initiative[15] is a good example of expanding outreach for an existing energy efficiency program to support a specific population. Through this initiative, the public health department and weatherization officials are working to reduce exposure to moisture and air pollutants in households with children who experience severe asthma. Depending on program outcomes, Contra Costa may choose to pursue other cross-departmental outreach initiatives to increase access to existing energy efficiency programs for households who can benefit the most. Direct service programs like this may also provide a useful opportunity to refer households to other energy efficiency services, such as energy audits and free toolkits from BayREN.

SUMMARY OF RECOMMENDATIONS FOR A NEW LOAN PROGRAM IN CONTRA COSTA COUNTY

As discussed throughout this report, there are few definitive best practices for energy efficiency loans; many promising strategies are also difficult to implement and create challenges and risks. This section summarizes some of the most firm recommendations for Contra Costa County, with the understanding that any new loan program's strategies will depend on their priorities.

Definitive recommendations

Loans should be unsecured. Secured loans pose too great of a risk to LMI borrowers.

The loan program should use a contractor network for contractor verification and quality control. Protecting borrowers from contractor fraud and ensuring quality service is crucial.

Programs must provide a way to perform prework repairs. Homes which require repairs are still in need of energy efficiency services, and many households are willing to accept the additional costs. Strict cost-effectiveness requirements preventing prework repairs create unacceptable barriers.

Programs must commit to outreach, program accessibility, and transparency. Programs must go beyond offering a useful service and make commitments to ensure that information about the program is easily available and widely distributed, and that the process of engaging with the program is easy and streamlined.

Programs must provide a robust complaints process. LMI borrowers are at risk of various harms, and programs must provide a pathway for identifying and addressing harms.

New loan programs should attempt to enroll in REEL. REEL provides a loan-loss reserve and a contractor network which may be able to substantially benefit a new energy-efficiency lender.

New loan programs should try to begin with a grant for a revolving loan fund. New programs need stability and flexibility, which is more easily provided by a RLF than by other ways to fund programs. Other sources of funding can be pursued after a program is established.

Program creators should seriously consider whether or not a new loan program is the best strategy for providing energy efficiency. Loans are not an ideal way to provide services to low-income households. And most LMI households already have access to energy efficiency loans through the REEL program. It is unlikely that creating a new loan program is the most effective way to increase overall access to energy efficiency in LMI households. Consider instead devoting resources to increasing uptake of REEL loans and accessing more funds for weatherization assistance.

Strong recommendations which may be challenging to implement

Programs should provide borrowers with flexibility in repayment and consider forgiving loans when needed. While these practices may create extra costs for loan programs, they provide significant benefits to borrowers, and substantially reduce the risk of harms from debt.

Programs should attempt to subsidize interest rates for lowest-access borrowers. Many low-income and low-financial-access households need energy efficiency services while being resource-limited. Lower interest rates make these services more useful and less risky.

Programs should consider offering loans with delayed repayment options. This practice removes ongoing financial strain and makes loans a much more suitable vehicle for providing energy efficiency. While costly to set up, it would provide large benefits.

Programs should consider competing with appliance installment plans. Appliance installment plans have very high interest rates, and smaller loans for appliances might help reduce burdens on households while promoting energy efficiency.

APPENDIX A: OVERVIEW OF RESIDENTIAL ENERGY EFFICIENCY PROGRAMS

Summary of Key Programs

Program	WAP/LIHEAP	ESA	REEL	PACE	Home+
Weatherization and insulation	✓	✓	✓	✓	✓
Duct repair and sealing	✓	✓	✓	✓	✓
Energy-efficient major installations (HVAC, furnaces, water heaters, stoves)	✓	✗	✓	✓	✓
Energy-efficient appliances (refrigerators, washers, dryers)	✗	✓	✓	✓	✓
Solar panels	✗	✗	✗	✓	✗
Pre-work repairs	✗	✗	✓	✓	✗
Non energy-efficiency work	✗	✗	✓	✓	✗
Estimated average benefit	$7,500	$1,000	$17,000	$20,000	$100-$5,000
Program scale	About 3,500 homes per year	About 200,000 homes per year	1,200 homes total	5,000-20,000 homes per year	About 2,000 homes per year
Trend in program scale	Constant	Constant	Growing rapidly	Shrinking rapidly	Growing slowly
Program type	Direct provision	Direct provision	Loan	Tax assessment (like a loan)	Rebate
Average interest rates	N/A	N/A	6.2%*	6-10%	N/A
Low-income homeowners eligible	✓	✓	✓	✓	✓
Moderate-income eligible	✗	✗	✓	✓	✓
High-income eligible	✗	✗	✓	✓	✗
Capacity to increase uptake	✗	✓	✓	✓	✓
Contractor verification	✓	✓	✓	✗	✓
Full program name	Weatherization Assistance Program / Low Income Home Energy Assistance Program	Energy Savings Assistance	Residential Energy Efficiency Loan	Property Assessed Clean Energy	Home+

*6.2% is the statewide average for all loans, but Contra Costa providers have lower interest rates than other providers. Newer REEL loans also have lower interest rates[50].

Federal Programs

The **Weatherization Assistance Program** (WAP) is run by the Department of Energy. It provides funding that "reduces energy costs for low-income households by increasing the energy efficiency of the homes while ensuring the resident's health and safety." About 35,000 homes receive weatherization services through WAP every year, or roughly one in every 3,500 households in the United States[51]. WAP is accessible to people in single-family and multifamily housing, as well as people in mobile homes, regardless of whether they own or rent their home. The average cost per unit for 2020 was $7669.

In California, Weatherization Assistance funds are distributed at the county level, as well as by some Native American tribes. People below 200% of the federal poverty level and below 60% of state median income are eligible for WAP, with priority going to people with disabilities, elderly people, households with small children, and households with higher energy burdens. Most counties also use funds from the federal Department of Health and Human Services' **Low-Income Home Energy Assistance Program** (LIHEAP), which is similar to WAP but has slightly different eligibility rules[52]. Roughly 30% of households in California may be eligible for weatherization assistance. Exact uptake numbers are uncertain, but some estimates suggest that roughly 0.01% of eligible households receive weatherization services through WAP each year[53]. The program is almost always oversubscribed, with counties providing services primarily to people who have priority.

WAP provides very specific and limited services. After a home is selected for weatherization, the local provider (in Contra Costa, a county employee) does an energy audit, including a blower-door test, an energy bill analysis, and an inspection of energy equipment. The energy auditor then provides a recommended scope of work for cost-effective energy efficiency measures. Allowed measures include insulation, weather-stripping, replacements of gas stoves, furnaces, and water heaters, installation of programmable thermostats, installations of water-saving devices, and replacement of broken windows. New roofing, siding, and structural improvements are not permitted, even if they are necessary for performing energy efficiency installations; energy-efficient appliances are also not covered. Work is completed by the providers or by subcontractors, and is later inspected[54].

---

[51] Department of Energy, Weatherization Assistance Program website. Accessed May 3, 2021. https://www.energy.gov/eere/wap/weatherization-assistance-program

[52] Department of Energy, "About the Weatherization Assistance Program" website. Accessed May 3, 2021. https://www.energy.gov/eere/wap/about-weatherization-assistance-program

[53] Community Action Partnership and Economic Opportunity Studies. "Estimated Number of Households Income-Eligible for the Department of Energy Weatherization Assistance Program as of 2015." 2015. https://communityactionpartnership.com/wp-content/uploads/2018/07/Estimated-Number-of-Households-Income-Eligible-for-WAP.pdf

[54] Department of Energy, "How to Apply for Weatherization Assistance" website. https://www.energy.gov/eere/wap/how-apply-weatherization-assistance

WAP leaves three major gaps in energy efficiency access for LMI homeowners. First, the program is not accessible to moderate-income households. Second, the limitations on allowable work mean the program is not appropriate for households who need prework repairs or who wish to combine energy efficiency with other repairs and remodeling. Third, not everyone who is confirmed eligible for the program is able to access it, as the program is oversubscribed.

California Programs

The **Energy Savings Assistance Program** (ESA) is a program operated by utilities in California. Through ESA, utilities provide free weatherization and energy efficiency services to low-income households. ESA is quite similar to WAP, with slightly different income cutoffs and a narrower scope of work. The average cost per unit is around $1,000. Statewide, ESA has served roughly 200,000 households per year over the past decade. ESA has performed a "first touch" of service provision on over 60% of eligible households in the state; PG&E, the utility in Contra Costa County, has met 100% of its ESA service goal of performing a first touch on "all eligible and willing households" for the end of 2020[55].

The future goals of ESA are the subject of the ongoing CPUC proceeding U39M, responding to applications by the major investor-owned utilities as well as MCE. This proceeding currently indicates that the utilities may attempt to expand ESA and focus on providing more extensive services to households already served by first touches, while also covering remaining and newly eligible households for limited service.

ESA does not provide major repairs and provides only a few services, including energy saving lighting and smart strips, weatherization services, and upgrades of certain appliances including refrigerators. Services provided vary based on need. Like WAP, it is not accessible to moderate-income homeowners and homeowners in need of prework repairs; unlike WAP, it has extremely high uptake.

The **California Hub for Energy Efficiency Financing** (CHEEF) operates several programs which support the financing of energy efficiency. CHEEF is administered by the California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA), through the California State Treasurer.

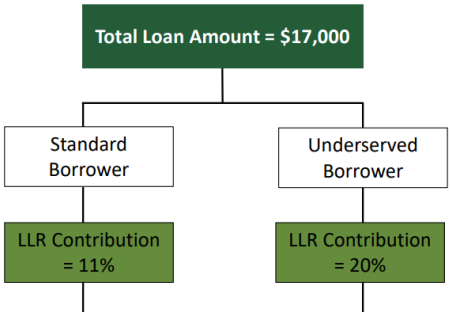
CHEEF currently operates three programs. The Small Business Financing Program and the Affordable Multifamily Finance Program are still in pilot as of writing. The **Residential Energy Efficiency Loan** (REEL), was approved to transition into a full program in 2018.

REEL facilitates energy efficiency loans through the **GoGreen Financing** platform. Lenders can enroll in REEL to gain access to a loan loss reserve for unsecured energy efficiency loans. REEL contributes to

[55] ALJ Tran, California Public Utilities Commission. Proposed decision on Agenda ID #19443, mailed 4/26/2021. Decision on Large Investor-Owned Utilities' and Marin Clean Energy's California Alternate Rates for Energy (CARE), Energy Savings Assistance (ESA), and Family Electric Rate Assistance (FERA) Program Applications for Program Years 2021-2026

the loan loss reserve for each loan a lender makes, and contributes more for underserved borrowers who are in LMI census tracts or who have credit scores less than 640[56]. At least 70% of the loan value must be used on eligible energy efficiency measures, including sealing and weatherization, HVACs, window replacements, appliances, and water heaters. Necessary repairs are also counted as eligible. In addition, up to 30% of the total loan amount can be used for non-energy measures like painting, remodeling, and landscaping. Solar panels and other distributed generation are not eligible, however.

REEL also manages a contractor network, and all work done through REEL loans must be performed by participating contractors. Contractors who apply to the network must complete a training and test, and submit credentials to complete their registration.



An example of how REEL's loan-loss reserve works, with a sample loan size of $17,000. Image from REEL[56].

REEL currently has 502 participating contractors as well as 8 participating lenders, all of whom are credit unions, and three of which are accessible from Contra Costa County. As of March 2021, REEL has provided 1,163 loans, with an average loan size of $17,000, an average interest rate of 6.2%, and an average loan term of roughly 9 years.

As part of its pilot program, REEL was subject to several evaluations, including surveys of participants and contractors. These evaluations found generally positive but complicated results. For example, most participants chose REEL because of its low interest rate, but most participants stated that they also would have had access to other loans based on their income and credit score. Many REEL loans are going to households in LMI census tracts, but those households may actually be high-income.

REEL provides most of the services that energy efficiency financing could be expected to provide. Loans are accessible to households with low credit; have low interest rates and good terms when compared to other energy efficiency financing programs; and use a contractor network and quality control. REEL loans allow for prework repairs and non-energy work. Uptake is still limited, but the Treasurer's Office is actively working to expand and promote the program.

The primary access gaps left by REEL are households with very low credit scores (<580), households who need very small loans (<$2,500), households who wish to install solar panels, and households for whom 6% interest rate is still too high. However, REEL is actively working to expand access. Average rates are falling over time, and are now substantially lower than they were when the program

[56] Residential Energy Efficiency Loan (REEL) Assistance Program, An Opportunity for Finance Companies presentation. November 12, 2020.

started. REEL is considering incorporating solar and creating a process for appliance financing through utility marketplaces.

REEL loans provide a very useful benchmark for a new loan program. Would a new program be able to provide better services than existing REEL loans? Would effort be better spent increasing uptake of REEL, training more contractors, and providing more energy audits and secondary services? These questions are hard to answer definitively, but are useful to consider.

Property Assessed Clean Energy

Property Assessed Clean Energy (PACE) is by far the most common way to finance energy efficiency in California. PACE is functionally very similar to a property-secured loan, but operates through slightly different financial mechanisms. Through PACE, a property owner can voluntarily agree to participate in a special assessment district, which gives them a unique tax designation. The local government can then provide a bond to a lender, who provides energy efficiency services to the property owner. The local government then assesses a special property tax onto the property through the assessment district, and that tax is used to pay off the bond. The bond is secured through a lien on the property itself. Because PACE involves assessment districts and government bonds, PACE providers must be approved by local governments. Many states use PACE to finance energy upgrades on commercial buildings (C-PACE), while only a few states allow PACE for residential buildings (R-PACE).

A key advantage of PACE over traditional loans is how the debt obligation transfers with the property rather than with the owner. If the owner sells the property before the bond is repaid, the new owner continues to repay the bond through tax assessments[57].

R-PACE in California has substantially contributed to energy efficiency, especially the uptake of residential solar installations[58]. From 2010 to 2020, R-PACE funded $4.4 billion in clean energy improvements in California on around 180,000 properties[59]. Average loan size was $24,000, and interest rates were between 6% and 10%[60].

---

[57] Department of Energy, "Property Assessed Clean Energy Programs" website. Accessed May 4, 2021. https://www.energy.gov/eere/slsc/property-assessed-clean-energy-programs

[58] Jeff Deason and Sean Murphy (2018). "Assessing the PACE of California residential solar deployment: Impacts of Property Assessed Clean Energy Programs on residential solar photovoltaic deployment in California, 2010-2015." Energy Analysis and Environmental Impacts Division, Lawrence Berkeley National Laboratory, Electricity Markets and Policy Group. March 2018. https://emp.lbl.gov/publications/assessing-pace-california-residential

[59] California State Treasurer, CAEATFA PACE Program Activity webpage, accessed May 12, 2021 https://www.treasurer.ca.gov/caeatfa/pace/activity.asp

[60] National Association of State Energy Officials, Issue Brief. "Residential Property Assessed Clean Energy (R-PACE): Key Considerations for State Energy Officials." March 2018. https://www.naseo.org/data/sites/1/documents/publications/NASEO%20R-PACE%20Issue%20Brief.pdf

R-PACE is particularly unsuitable for low- and moderate-income homeowners. PACE eligibility is usually determined through the characteristics of the home, not the borrower, meaning people can participate in PACE even if they do not have the income necessary to repay the loan. PACE assessments are secured by properties, so borrowers face risks of losing their homes; transferring these liens can also cause conflicts or confusions when owners attempt to sell their homes. Because PACE is not technically debt, it does not show up on credit reports, meaning it can facilitate predatory inclusion in other programs by making borrowers appear to have more discretionary income than they actually do. And while PACE has lower interest rates than credit card debt and many other personal loans, the interest rates are still higher than they are for other energy efficiency financing programs.

PACE can also facilitate fraud. PACE assessments usually do not require energy audits or involve quality control. Contractors therefore have an incentive to make misleading claims about the benefits of energy efficiency renovations in order to encourage potential customers to use PACE to finance large projects. Higher-income customers who have more options and more resources may be able to navigate this system to avoid fraud, but low-income borrowers are extremely vulnerable[22].

In recent years, PACE has received substantial negative attention for these issues, leading to new regulations, litigation, and public mistrust. This shift has caused a substantial drop in PACE enrollments. The largest PACE provider in California, Renovate America, filed for bankruptcy in late 2020[61]. In February, California State Senator Min introduced SB 476 which would require energy audits and inspections for PACE work[62]. If passed, these protections may help prevent instances of fraud, but do not change the fundamental nature of PACE as a secured form of invisible debt, which makes it unsuitable for low- and moderate-income borrowers.

Rebates

Several programs provide small rebates for energy efficiency purchases. In Contra Costa County, the largest of these is the Bay Area Regional Energy Network (BayREN) Home+ program, which offers rebates up to $5,000 for energy efficiency purchases to households who have not already accessed ratepayer funds for energy efficiency (i.e., have not used ESA) and perform work with a contractor registered in BayREN's network. Home+ primarily aims to support moderate-income households. BayREN also provides a suite of other energy efficiency services, including energy audits. BayREN's targets for homes served were 1,800 in 2019 and 2,700 in 2020, but they have not yet released

[61] San Diego Tribune, Mike Freeman. "Green home improvement lender Renovate America files for bankruptcy." December 23, 2020. Accessed May 4, 2021. https://www.sandiegouniontribune.com/business/story/2020-12-23/green-home-improvement-lender-renovate-america-files-for-bankruptcy

[62] SB-476 bill text, accessed May 4, 2021 at https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB476

information on their actual service numbers, which may have been impacted by the COVID-19 pandemic[63].

Many other entities have rebate programs for energy efficiency, including PG&E's rebates for specific efficient products[64], MCE's heat pump water heater rebates[65], and the IRS's Residential Energy Credit[66]. These rebates can have different eligibility requirements and may not be cross-compatible.

Detailed information about uptake and average rebate sizes is difficult to find for all of these programs. However, these rebates are an important factor in the energy efficiency landscape, and may be able to help make other programs more effective.

[63] Bay Area Regional Energy Network (BayREN) Single Family Residential Program Implementation Plan PY2021. September 1, 2020.
[64] PG&E website, "Get energy efficiency rebates for your home." Accessed May 4, 2021. https://www.pge.com/en_US/residential/save-energy-money/savings-solutions-and-rebates/how-to-apply/how-to-apply.page
[65] MCE energy savings website, accessed May 4, 2020 at https://www.mcecleanenergy.org/home-savings/
[66] Internal Revenue Service, "Instructions for Form 5695 (2020), Residential Energy Credits." Accessed May 3, 2021. https://www.irs.gov/instructions/i5695

APPENDIX B: ON-BILL REPAYMENT

Many of the experts interviewed for this report discussed on-bill repayment options as an important strategy for energy efficiency financing. On-bill repayment is a form of energy efficiency financing where households pay off energy efficiency loans on their electricity bills. This is appealing for a few reasons. Electricity bills have a high payment rate, so loans payments assessed through electricity bills may be easier to collect. Households who access energy efficiency loans may hope to offset loan costs through savings on electricity bills, and on-bill repayment makes that connection explicit, ideally allowing households to experience a slight drop in their electricity bills while repaying the loan, followed by a more substantial drop after the loan is repaid. This effectively provides households with a costless delayed reduction in their electricity costs.

On-bill repayment can take several forms. Usually, on-bill repayment refers to loans made by private lenders which are repaid through the utility bill, with no financial involvement of the utility other than mediating the repayment. On-bill financing usually refers to loans which are made by the utilities directly, using ratepayer or shareholder funds. Tariffed on-bill refers to energy upgrades which are treated as an extra service provided by the utility which incurs a service charge on an electricity bill; in this model, beneficiaries never face any debt. Pay As You Save® is a specific form of tariffed on-bill service with a requirement that financing costs be restricted to 80% of projected savings, ensuring positive cash flow and with other measures to protect borrowers[67].

Businesses in PG&E service territory have access to commercial on-bill financing options, but single-family residences do not. However, on-bill options are being discussed in the ongoing CPUC energy efficiency proceeding[41].

It is not possible for a small independent lender to easily create an on-bill repayment program, as it would require coordination with PG&E and may require CPUC approval. It is possible that MCE would be able to create an on-bill lending program, but this would still require significant coordination with PG&E and the CPUC. As the CPUC is already discussing on-bill repayment options, it is unlikely that any external effort to create an on-bill program will be successful on a timescale faster than what is already occurring.

On-bill programs appear to have a high potential for useful service provision. Utilities already make contact with many households and may be able to identify households for whom energy efficiency financing would be useful. Tariffed models like Pay As You Save could hypothetically be instituted as a near-universal service for low-income households, similarly to ESA. On-bill programs may also face challenges, including challenges addressing prework repairs and managing property transfers.

[67] Clean Energy Works, PAYS® for Energy Efficiency webpage. Accessed May 8, 2021 at https://www.cleanenergyworks.org/about-pays-for-ee/

APPENDIX C: RESOURCES FOR STARTING A NEW PROGRAM

This section describes specific resources which might be used to start a new program. It is in no way comprehensive; this report was not trying to assemble resources for starting a new program.

Useful reports: Four documents referenced in this report may be particularly useful for new program designers.

- BayREN's Single Family Moderate Income Market Characterization Study[6] (2018) provides key information on the motivations, needs, and choices of single family moderate income households pursuing energy efficiency
- SEE Action's State "Energy Efficiency Financing for Low- and Moderate-Income Households: Current State of the Market, Issues, and Opportunities[8]" (2017) provides a thorough overview of LMI household characteristics and finance products for energy efficiency
- Berkeley Environmental Law Clinic's "The Dark Side of the Sun: How PACE Financing Has Under-Delivered Green Benefits and Harmed Low Income Homeowners[22]" (2021) provides a crucial description of low-income homeowners' financial vulnerabilities and vulnerability to fraud
- Opinion Dynamics' Final Impact Evaluation Report[30] (2020) for the Residential Energy Efficiency Loan Program provides insights into overall needs and challenges for financing energy efficiency

Partnerships: A new program may be able to enroll in REEL, although a small-scale nonprofit lender like SELF would be a substantially different participant from the credit unions currently enrolled. However, partnering with REEL would give a program access to the loan loss reserve and contractor network, subsidizing loans while also reducing the amount of work needed for contractor outreach.

A new program could also partner with BayREN. BayREN has attempted to facilitate energy efficiency loans in multifamily housing, and may be interested in single-family housing financing as well. BayREN also has a contractor network and provides energy audits, key services for a new loan program.

Funding sources: CDFI lenders and impact lenders in the Bay Area may or may not be easily accessible for a new loan program leveraging credit. BayREN faced some challenges encouraging lenders to make loans for multiproperty energy efficiency financing, although these lenders may be different from the impact lenders a new CDFI lender might pursue. However, the American Jobs Act includes funding for a Clean Energy Accelerator, specifically to support energy efficiency financing. A new revolving loan fund could start using funding from that program, should the bill pass.

Consulting: The Solar and Energy Loan Fund does consulting for other groups working on energy efficiency. Consulting with them may grant access to additional knowledge and expertise, especially around building an ability-to-pay eligibility model and pursuing impact capital.

ENDNOTES

[1] "What is an energy-efficient home" webpage, Natural Resources Canada. Last modified January 2, 2020; accessed May 3, 2021. https://www.nrcan.gc.ca/energy-efficiency/energy-efficiency-homes/what-energy-efficient-home/20548

[2] HUD User Website, Office of Policy Development and Research, Income Limits webpage. Accessed May 7, 2021. https://www.huduser.gov/portal/datasets/il.html#2021_data

[3] United States Census Bureau, ACS 1-Year Estimates-Public Use Microdata Sample. Accessed May 7, 202 at data.census.gov

[4] Draft CalEnviroScreen 4.0, accessed May 3, 2021 at https://www.aclima.io/blog/illuminating-hyperlocal-air-pollution-in-richmond-san-pablo-4d7fd59e9886. Specifically, high levels of Diesel Particulate Matter and Toxic Releases in residential areas of Richmond, including census tracts 6013376000, 6013377000, and 6013379000.

[5] United for ALICE website, accessed May 14, 2021 at https://www.unitedforalice.org/

[6] BayREN Single Family Moderate Income Market Characterization Study, Grounded Research and Consulting LLC. https://cbbf458e-67d0-4a11-9597-023b97b18cc4.filesusr.com/ugd/1ef210_a9da38337e86404f942e2152c7eb576b.pdf?index=true

[7] Ariel Drehobl, Lauren Ross, and Roxana Ayala (2020). "How High Are Household Energy Burdens? An Assessment of National and Metropolitan Energy Burden across the United States." American Council for an Energy-Efficient Economy. September 2020. https://www.aceee.org/research-report/u2006

[8] State and Local Energy Efficiency Action Network (2017). "Energy Efficiency Financing for Low- and Moderate-Income Households: Current State of the Market, Issues, and Opportunities." Prepared by: Greg Leventis, Chris Kramer, and Lisa Schwartz of Lawrence Berkeley National Laboratory. August 2017. https://emp.lbl.gov/publications/energy-efficiency-financing-low-and

[9] Northeast Energy Efficiency Partnerships, Inc. (2017). "Non-Energy Impacts Approaches and Values: an Examination of the Northeast, Mid-Atlantic, and Beyond." Prepared by: Samantha Caputo, Lisa Cascio, Serge Jean-Baptiste, Chris Tanner, Elizabeth Titus, and other NEEP staff. June 2017. http://www.neep.org/sites/default/files/resources/NEI%20Final%20Report%20for%20NH%206.2.17.pdf

[10] Aclima (2020). "Illuminating Hyperlocal Air Pollution in Richmond-SanPablo." By: Melissa Lunden. February 20, 2020; accessed May 3, 2021. https://www.aclima.io/blog/illuminating-hyperlocal-air-pollution-in-richmond-san-pablo-4d7fd59e9886

[11] Mary P Naughton, Alden Henderson, Maria C Mirabelli et al (2002). "Heat-related mortality during a 1999 heat wave in Chicago." American Journal of Preventative Medicine, May 2002. https://www.ajpmonline.org/article/S0749-3797(02)00421-X/abstract

[12] "Multiple Benefits of Energy Efficiency: Health and wellbeing" webpage, International Energy Agency. March 2019; accessed May 3, 2021. https://www.iea.org/reports/multiple-benefits-of-energy-efficiency/health-and-wellbeing

[13] Christine Liddell and Chris Morris (2010). "Fuel poverty and human health: A review of recent evidence." Energy Policy, June 2010. https://www.sciencedirect.com/science/article/abs/pii/S0301421510000625

[14] "Responsible Appliance Disposal (RAD)", Environmental Protection Agency. Accessed May 3, 2021. https://www.epa.gov/rad/consumers

[15] Contra Costa County Asthma Initiative presentation, given by Michael Kent, November 19, 2020. https://www.bayrencodes.org/wp-content/uploads/2020/11/05_Kent_Contra-Costa-Asthma-Initiative-Presentation.pdf

[16] Frederick Solt (2010). "Does Economic Inequality Depress Electoral Participation? Testing the Schattschneider Hypothesis." Political Behavior, January 2010. https://link.springer.com/article/10.1007/s11109-010-9106-0

[17] Wikipedia, "American Recovery and Response Act of 2009." Accessed May 3, 2021. https://en.wikipedia.org/wiki/American_Recovery_and_Reinvestment_Act_of_2009

[18] White House website, "FACT SHEET: The American Jobs Plan." March 31, 2021; accessed May 3, 2021. https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan/

[19] E2 (2020). "Clean Jobs California: America's Clean Energy Powerhouse in the Wake of COVID-19." June 2020. https://e2.org/reports/clean-jobs-california-2020/

[20] Office of Energy Efficiency & Renewable Energy, U.S. Department of Energy. "Weatherization Assistance Program Fact Sheet." March 21, 2017. https://www.energy.gov/eere/wap/downloads/weatherization-assistance-program-fact-sheet

[21] Ian Dunham (2019). "Landscapes of Financial Exclusion: Alternative Financial Service Providers and the Dual Financial Service Delivery System." Business and Society Review, 2019. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3587806#

[22] Berkeley Law Environmental Law Clinic (2021). "The Dark Side of the Sun: How PACE Financing Has Under-Delivered Green Benefits and Harmed Low-Income Homeowners." Prepared by: Claudia Polsky, Claire Christensen, Kirsten Ho, Melanie Ho, and Christina Ismailos. February 2021. https://www.law.berkeley.edu/wp-content/uploads/2021/02/ELC_PACE_DARK_SIDE_RPT_2_2021.pdf

[23] UC Berkeley's Urban Displacement Project and the California Housing Partnership. "Rising Housing Costs and Re-Segregation in Contra Costa County." No date provided, but based on citations, paper appears to be have been finalized in September 2018. http://urbandisplacement.org/sites/default/files/images/cc_final.pdf

[24] Contra Costa County Consortium (2016). "Analysis of Impediments to Fair Housing Choice." 2016. https://www.contracosta.ca.gov/DocumentCenter/View/45535/Contra-Costa-County-Consortium-AI-2015-2020-Update

[25] Patricia A. McCoy and Kathleen C. Engel (2007). "Predatory Lending and Community Development at Loggerheads." Boston College Law School Faculty Papers, January 2007. https://lawdigitalcommons.bc.edu/cgi/viewcontent.cgi?article=1785&context=lsfp

[26] Andrew Hood, Robert Joyce, and David Sturrock (2018). "Problem debt and low-income households." Institute for Fiscal Studies, January 2018.

[27] Researchers have accumulated substantial evidence that cash transfers to low-income people lead to disproportionately positive impacts, with local economic benefits as high as 2.7 times the initial cash influx. See: Hasdell, 2020, "What we know about universal basic income: a cross-synthesis of reviews" and Egger, Haushofer, Miguel, Niehaus, and Walker, 2019, "General Equilibrium Effects of Cash Transfers: Experimental Evidence from Kenya." Researchers have also found significant secondary benefits from energy subsidy programs such as California Alternate Rates for Energy, which are more comparable to the effects of an energy efficiency direct provision program. But focusing economy-wide costs and benefits can cover the basic moral point of such programs. Low-income people often do not have enough money to maintain stability and cover their basic needs, and giving them more money and more services is good, for them and for society as a whole, from a foundationally ethical standpoint as opposed to a strategic one.

[28] Reem Rayef (2020). "Housing Equity & Building Decarbonization in California." August 2020. https://nrdc1-my.sharepoint.com/:b:/g/personal/pdelforge_nrdc_org/EetZBNlTiDpPqlfDJTQDJVMBmJwVQFBoYP1AGIQCr1L5zw?e=dabgAt

[29] Will Fischer and Barbara Said. "Chart Book: Federal Housing Spending Is Poorly Matched to Need." Center on Budget and Policy Priorities. Updated March 8, 2017; accessed May 3, 2021. https://www.cbpp.org/research/housing/chart-book-federal-housing-spending-is-poorly-matched-to-need

[30] Opinion Dynamics. "Residential Energy Efficiency Loan Assistance Pilot: Final Impact Evaluation Report." January 2020. https://pda.energydataweb.com/api/view/2329/CPUC%20Group%20B%20FIN20%20REEL%20Evaluation%20Final%20Report%20FINAL%202020-01-13.pdf

[31] California Public Utilities Commission, Resolution E-5072, "Disposition of the Residential Energy Efficiency Loan Program." April 16, 2020. https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M333/K594/333594988.PDF

[32] GoGreen Financing website, accessed May 12, 2021. https://gogreenfinancing.com/

[33] Disadvantaged Communities – Single-family Affordable Solar Homes (DAC-SASH) is a direct provision program which installs solar panels on single-family homes in disadvantaged communities. It is not an energy efficiency program, however, and is currently oversubscribed. See https://gridalternatives.org/what-we-do/program-administration/dac-sash

[34] Solar and Energy Loan Fund main website, https://solarenergyloanfund.org/ accessed May 4, 2020

[35] SELF FY 2016 Annual Report "Rebuilding and Empowering Underserved Communities." https://solarenergyloanfund.org/site/wp-content/uploads/2019/11/SELF_2016-Annual-Report_2016.pdf

[36] SELF FY 2017 Annual Report "Rebuilding and Empowering Underserved Communities." https://solarenergyloanfund.org/site/wp-content/uploads/2019/11/SELF_2017-Annual-Report_2017.pdf

[37] SELF FY 2019 Summary / Q1 Impact Report, https://solarenergyloanfund.org/site/wp-content/uploads/2019/11/SELF-Q1-2019-Impact-Report.pdf

[38] SELF FY 2019 3rd Quarter Report "Rebuilding and Empowering Underserved Communities" https://solarenergyloanfund.org/site/wp-content/uploads/2019/11/SELF-Q3-2019-Impact-Report.pdf

[39] The Desert Sun, Rob Nikolewski. "California begins debate on new rooftop solar rules: How might they affect you?" March 16, 2021. https://www.desertsun.com/story/news/environment/2021/03/16/california-begins-debate-new-rooftop-solar-rules-how-might-they-affect-you/4717953001/

[40] In addition to SELF and REEL, research for this report involved examining Washington's Home Rehabilitation Loan Program (which is discussed in Delayed Repayment) as well as Kansas' How$mart and Connecticut's PosiGen. These programs' low default rates may be a feature of survivorship bias; programs with higher default rates may have gone out of business, may be less visible or famous, or may have chosen not to publish statistics.

[41] CPUC Order Instituting Rulemaking 20-08-022, "Order Instituting Rulemaking to Investigate and Design Clean Energy Financing Options for Electricity and Natural Gas Customers." https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M346/K361/346361154.PDF

[42] Bay Area Regional Energy Network, "Insights from BayREN's Bay Area Multifamily Capital Advance Pilot Program and Lender Referral Service, 2014-2020."

[43] U.S. Department of the Treasury, Community Development Financial Institutions Fund website. Accessed May 4, 2021. https://www.cdfifund.gov/

[44] CDFI Coalition, CDFIs In California Fact Sheet. http://www.cdfi.org/wp-content/uploads/2015/03/California.pdf

[45] Christina Jenq, Jessica Pan, and Walter Theseira (2015). "Beauty, weight, and skin color in charitable giving." Journal of Economic Behavior & Organization, November 2015. https://www.sciencedirect.com/science/article/pii/S0167268115001675

[46] Racial Justice & Equal Economic Opportunity Project, National Consumer Law Center (2016). "Past Imperfect: How Credit Scores and Other Analytics 'Bake In' and Perpetuate Past Discrimination." http://www.nclc.org/images/pdf/credit_discrimination/Past_Imperfect050616.pdf

[47] Washington State Department of Commerce, New Home Rehabilitation Loan Program (HRLP) for Rural Low-Income Households website. Accessed May 5, 2020. https://www.commerce.wa.gov/growing-the-economy/energy/weatherization-and-energy-efficiency/rural-rehab/

[48] Amanda Raines, Washington State Department of Energy, Home Rehabilitation Loan Program presentation, August 2020. https://www.naseo.org/Data/Sites/1/naseo-hrlp-a-rains.pdf

[49] Best Buy, "Financing Your Purchase at Best Buy" website. Accessed May 5, 2021. https://www.bestbuy.com/site/financing-rewards/learn-about-best-buy-financing/pcmcat1476112234971.c?id=pcmcat1476112234971

[50] California State Treasurer, CHEEF Reports and Additional Materials website. Accessed May 8, 2021. https://www.treasurer.ca.gov/caeatfa/cheef/cheef-reports-and-additional-materials.asp

[51] Department of Energy, Weatherization Assistance Program website. Accessed May 3, 2021. https://www.energy.gov/eere/wap/weatherization-assistance-program

[52] Department of Energy, "About the Weatherization Assistance Program" website. Accessed May 3, 2021. https://www.energy.gov/eere/wap/about-weatherization-assistance-program

[53] Community Action Partnership and Economic Opportunity Studies. "Estimated Number of Households Income-Eligible for the Department of Energy Weatherization Assistance Program as of 2015." 2015. https://communityactionpartnership.com/wp-content/uploads/2018/07/Estimated-Number-of-Households-Income-Eligible-for-WAP.pdf

[54] Department of Energy, "How to Apply for Weatherization Assistance" website. https://www.energy.gov/eere/wap/how-apply-weatherization-assistance

[55] ALJ Tran, California Public Utilities Commission. Proposed decision on Agenda ID #19443, mailed 4/26/2021. Decision on Large Investor-Owned Utilities' and Marin Clean Energy's California Alternate Rates for Energy (CARE), Energy Savings Assistance (ESA), and Family Electric Rate Assistance (FERA) Program Applications for Program Years 2021-2026

[56] Residential Energy Efficiency Loan (REEL) Assistance Program, An Opportunity for Finance Companies presentation. November 12, 2020.

[57] Department of Energy, "Property Assessed Clean Energy Programs" website. Accessed May 4, 2021. https://www.energy.gov/eere/slsc/property-assessed-clean-energy-programs

[58] Jeff Deason and Sean Murphy (2018). "Assessing the PACE of California residential solar deployment: Impacts of Property Assessed Clean Energy Programs on residential solar photovoltaic deployment in California, 2010-2015." Energy Analysis and Environmental Impacts Division, Lawrence Berkeley National Laboratory, Electricity Markets and Policy Group. March 2018. https://emp.lbl.gov/publications/assessing-pace-california-residential

[59] California State Treasurer, CAEATFA PACE Program Activity webpage, accessed May 12, 2021 https://www.treasurer.ca.gov/caeatfa/pace/activity.asp

[60] National Association of State Energy Officials, Issue Brief. "Residential Property Assessed Clean Energy (R-PACE): Key Considerations for State Energy Officials." March 2018. https://www.naseo.org/data/sites/1/documents/publications/NASEO%20R-PACE%20Issue%20Brief.pdf

[61] San Diego Tribune, Mike Freeman. "Green home improvement lender Renovate America files for bankruptcy." December 23, 2020. Accessed May 4, 2021. https://www.sandiegouniontribune.com/business/story/2020-12-23/green-home-improvement-lender-renovate-america-files-for-bankruptcy

[62] SB-476 bill text, accessed May 4, 2021 at https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB476

[63] Bay Area Regional Energy Network (BayREN) Single Family Residential Program Implementation Plan PY2021. September 1, 2020.
[64] PG&E website, "Get energy efficiency rebates for your home." Accessed May 4, 2021. https://www.pge.com/en_US/residential/save-energy-money/savings-solutions-and-rebates/how-to-apply/how-to-apply.page
[65] MCE energy savings website, accessed May 4, 2020 at https://www.mcecleanenergy.org/home-savings/
[66] Internal Revenue Service, "Instructions for Form 5695 (2020), Residential Energy Credits." Accessed May 3, 2021. https://www.irs.gov/instructions/i5695
[67] Clean Energy Works, PAYS® for Energy Efficiency webpage. Accessed May 8, 2021 at https://www.cleanenergyworks.org/about-pays-for-ee/