



PROGRAM DESIGN CONSIDERATIONS FOR DEVELOPING AN ON-BILL FINANCING PROGRAM

A Primer for Utilities in Michigan

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ABOUT THE AUTHORS:

Michigan Saves: Michigan Saves is a nonprofit dedicated to making energy improvements easier for all Michigan energy consumers. To accomplish this, Michigan Saves makes affordable financing and other incentives available through grants and partnerships with private sector lenders. They also authorize and monitor a network of contractors and recognize those with advanced training. Their current portfolio includes programs for residential, multifamily, commercial and municipal customers, and supports energy-efficiency, geothermal, and solar PV projects. For more information, visit www.MichiganSaves.org.

Holland Board of Public Works (HBPW): HBPW is a community-owned enterprise providing electric generation and distribution, water, wastewater treatment, and broadband utility services to nearly 28,000 business and residential customers in the Holland area. HBPW is committed to enhancing the economic and environmental vitality of the community and providing reliable services at the lowest rates achievable through innovation, efficiency, and professional operations.

Collaborative Efficiency (CE): CE focuses on municipal utilities and electric cooperatives, helping consumer-owned utilities capture the benefits of energy efficiency through research and analysis as well as program planning and implementation support. CE has been very involved in energy-efficiency financing and residential retrofit programs and recently completed work on a study of electric vehicles.

The Environmental and Energy Study Institute (EESI): EESI is a 501(c)(3) nonprofit organization dedicated to promoting environmentally sustainable societies. EESI recently launched a national on-bill financing (OBF) initiative to help improve the energy efficiency of homes served by public utilities.

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INTRODUCTION



Purpose of This Document:

This report is intended to help utilities in Michigan learn more about why and how to implement a residential on-bill program. An on-bill program is a financial collection mechanism whereby financing for clean energy improvements is repaid by the building owner on their monthly utility bill. This document will prepare stakeholders to discuss program goals, key program design decisions, and strategies for best meeting the needs of customers. Five case studies from existing on-bill programs run by utilities around the country offer lessons learned, program design considerations, and inspiration.

Why On-bill Financing?

Many homeowners lack the funds to make clean energy investments, especially for bigger ticket items that can produce the greatest energy savings. High up-front costs and a lack of easily accessible financing are commonly cited as the key barriers to investments in residential energy efficiency (Kapur et al. 2011). Rebate programs do not significantly lower this barrier. A residential energy-efficiency upgrade that includes insulation; building envelope upgrades; and heating, ventilation, and air conditioning (HVAC) improvements will often cost thousands of dollars, and installing a renewable energy system is even more costly. Access to financing is essential for reaching large numbers of homeowners and unlocking the many benefits of energy efficiency and renewable energy.

Over the past several decades, a range of clean energy financing tools have been developed with the goal of reducing the up-front costs for clean energy improvements. An on-bill program is a common energy-efficiency and renewable energy financing tool. As of 2015, 32 states have legislation related to on-bill programs or utilities that have implemented (or are currently developing) on-bill programs (NCSL 2015).

Other residential financing mechanisms that currently exist for customers that want to make clean energy improvements include the Michigan Saves Home Energy Loan Program, home equity loans, credit cards, and personal loans. There are also options available from the Michigan State Housing Development Authority for homeowners with equity in their home, an annual household income of up to \$105,700, and a credit score of at least 620.

An on-bill program is a financial collection mechanism whereby financing for clean energy improvements is repaid by the building owner on their monthly utility bill.

While existing options add diversity to the financing tools available, in each case there is something unique about on-bill programs that help fill a gap. For example:

1. **Expanding access:** Existing clean energy financing tools active in Michigan use traditional underwriting criteria and may not be available or attractive to all customers, such as those with tarnished credit. Those who don't qualify for these programs may qualify using utility repayment history.
2. **Greater affordability:** The 2014 Municipal Utility Residential Clean Energy Program Act (PA 408) and the 2016 Clean and Renewable Energy and Energy Waste Reduction Act (PA 342) allow for terms of up to 15 years, which make comprehensive efficiency and renewable energy improvements more affordable for homeowners. Extended-term financing is beneficial for low- to moderate- and fixed-income individuals who need low, fixed monthly payments.
3. **Solutions for tenants and other short-term occupants:** On-bill programs can be structured to allow the debt obligation to be transferred to subsequent occupants. This is an enticing option for those who are interested in making improvements, but expect to move soon.
4. **Customer ease:** In addition to high up-front costs for making energy improvements, lack of information and transaction costs can hold projects back. On-bill programs can address these barriers by integrating the improvement and payment process into customers' existing billing and customer services relationship with their energy provider.

Despite its many benefits, offering an on-bill program alone is not enough to encourage participation in clean energy improvement programs. A 2014 review of on-bill programs found that ten out of the 17 residential on-bill programs evaluated had market penetration rates of less than 1 percent over their program lifetime. However, two long-running programs (12 to 13 years in the field) have been able to serve up to 15 percent of their target market (SEEACTION 2014). Effective program design—including targeted marketing and outreach, a strong network of home performance contractors, and reliable customer service—can help maximize the uptake of on-bill programs in your service territory.

PROGRAM DESIGN CONSIDERATIONS

Many choices need to be made as on-bill programs are designed and implemented. The following three subsections—program scope, program financing, and program administration—outline these key considerations and the range of options available.

Section One: Program Scope

Establishing the scope of an on-bill program is a critical first step; it is important that the scope align with program goals. As such, when developing the scope of your program, the first step should be to establish goals.

Setting Goals

There are two fundamentally different situations utilities will find themselves in as they begin to consider the scope of their program and program goals: a) they have an existing program they want to improve, or b) they are starting a brand new program that may need financing. Goal setting should vary accordingly.

For example, a goal could simply be to expand participation in an existing program, which means the financing component is added on to a program that is already functioning and likely has existing program goals. If the program is being developed from scratch, goal setting is a more involved process.

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Is the goal to reduce greenhouse gas emissions? Is it resource acquisition? Is it to maximize per-home energy savings for increased customer satisfaction ratings? To meet a legal mandate? To reach an underserved customer (e.g., low income)? Establishing two to three primary goals will help program administrators make program design decisions and prioritize resources.

Assessing Barriers to Program Goals

Once the goals are set, program planners should evaluate the barriers to reaching those goals. Is financing a key barrier? Perhaps the utility has an existing program that is not meeting goals, but this could be remedied by addressing other issues and not adding a financing component. Perhaps financing is already accessible to program participants through contractors, local lenders, or a statewide financing program. Is financing truly a barrier to meeting program goals? Remember, financing alone is not a program, it is a component of a program. Are there other more critical program components that should be addressed first to overcome barriers?

Develop Program Participation Requirements

Aside from meeting creditworthiness standards, it is essential to have parameters related to program participation. For example, if the program is limited to residential building stock, what defines a residential building (e.g., four units or less)? How should upgrades to gas measures be handled if the electric utility is providing the financing? Will rental properties be allowed? Answering these and other questions are critically important during the program design process.



Selecting Eligible Measures

There are several questions to consider when selecting eligible program measures.

- How will the source of capital that you are using limit eligible measures? For example, some grant programs only allow funding to be used for energy-efficiency measures, and foundation capital often limits funding to the mission of the foundation (e.g., low-income communities).
- Will there be a cost effectiveness requirement? For many utilities, this is set by law or by regulation. Will the installed measures need to result in bill neutrality—meaning that the expected energy savings from energy improvements should at least offset monthly loan payments? Are longer repayment periods (and therefore smaller loan payments) an option to make bill neutrality an easier target?
- Will distributed energy (e.g., rooftop solar PV) be allowed? In Michigan, PA 408 and PA 342 allows for energy-efficiency, renewable energy, and water conservation measures.
- Non-energy-efficiency measures (NEMs) that often address health or safety issues in a home are permitted in some on-bill programs and may be a valuable strategy for driving consumer adoption in certain market segments. One example is replacing knob and tube wiring before adding wall insulation. Will NEMs be eligible measures?
- Is fuel switching (e.g., moving from propane to electric heating) an allowable use of the loans?

Assessing Available Program Administrative Resources

Depending on the goals and scope of the program, designing and implementing on-bill programs can require specialized administrative resources to manage information technology, billing, contractor management, and quality assurance. Many on-bill programs hire third-party administrators, form or hire nonprofits to run the program, or dedicate multiple staff resources to managing the program. Another option is to join an existing program being offered by another entity or a neighboring utility. A lack of administrative resources may limit the scope of your program.

Adopting a Resolution of Intent or Submitting a Plan to Michigan Public Service Commission

In Michigan, PA 408 requires a municipality to adopt a resolution of intent before launching a clean energy on-bill program. The resolution must outline the reasons why the financing of energy projects is a valid public purpose. Additionally, a report providing details about the program design must accompany the resolution.

For rate-regulated utilities, PA 342 requires submission of a residential energy projects program plan to the Michigan Public Service Commission (MPSC). The plan must include the following information:

- An estimate of administrative costs
- The name of the residential energy projects program administrator and whether this administrator is a third party
- The application process and eligibility requirements for customers
- The application form, which provides the terms and conditions for participation, an explanation of the billing process and provisions, an explanation of the required baseline home energy audit, and an acknowledgment that electric or natural gas service may be disconnected for nonpayment of the installment loan amount
- A description of any fees to cover application, administration, or other program costs to be charged to the customer; the procedures for determining such fees; and the amount (if known) of the fees
- The provisions for billing customers for any program fees and the provisions for the monthly installment payments as a per-meter charge on the bill for electric or natural gas service
- The provisions for marketing and participant education

PA 342 states that the MPSC must approve a residential energy projects program plan as “reasonable and prudent” before an on-bill program can be launched by a regulated utility.

Section Two: Program Financing

The following section provides a high-level overview of financial considerations that program administrators must evaluate, including capitalizing an on-bill program, assessing the creditworthiness of potential participants, selecting a loan or tariff financing structure, determining credit enhancements and addressing nonpayment or transfer of property.

Sources of Capital

Below are the common sources of capital used to fund on-bill programs:

- **Internal utility reserves:** Utility reserve funds are the most common source of capital for on-bill programs (SEEACTION 2014). The amount of utility reserves that can be allocated to the program is dependent on the extent of available cash reserves, internal policies about maintaining a minimum cash reserve level, and considerations about how using reserves may impact the financial health of the utility (e.g., impact to credit rating). The use of internal utility reserves allows flexibility in the initial program phase and can drive demand in the short term. On-bill programs can be established as revolving loan funds that utilize interest and principal payments on old loans to issue new ones. However, depending on the repayment terms, once the capacity of the loan pool is reached, the returning capital in the form of customer monthly repayments will be slow. This constricts the program from originating new loans, unless there are sufficient reserves to expand the program or the utility sells the loan portfolio to recapitalize the on-bill program.
- **Public funding:** Applying for and receiving grants from federal and state sources is a common strategy for collecting the initial startup capital needed for a residential on-bill program. The American Recovery and Reinvestment Act provided significant funding for on-bill programs; however, current similar public funding is far less robust. Currently, the U.S. Department of Agriculture (USDA) has two initiatives that could fund on-bill programs—the Rural Energy Savings Program (RESP) and the Energy Efficiency and Conservation Loan Program (EECLP). The RESP

Sources of Capital (continued)

provides 0% interest loans, with terms up to 20 years to rural utility service borrowers, which could use the funding to implement an on-bill program (USDA 2016a). The EECLP provides loans to rural utility service borrowers at rates tied to the U.S. Department of Treasury interest rates (USDA 2016b). The utilities can then relend the funds to commercial, industrial, and residential consumers. The interest rate is capped at 1.5% above the cost of capital to the utility service borrower and terms are capped at 15 years (SEEAaction 2014).

- **Ratepayer funds:** A possible way to fund on-bill programs is to develop a separate and dedicated funding mechanism, collected in rates, to support the program. This utility tariff can be applied across a category of ratepayers (i.e., residential electricity customers) in the form of a charge on a per-kilowatt-hour usage/consumption basis. Typically, there are cost-benefit requirements associated with programs that are funded with ratepayer dollars, which can limit program design. While the cost of ratepayer capital is less than utility capital, programs funded by ratepayers are not as large. For example, 14 percent of the largest and most active programs across the country are funded with ratepayer funds, but these programs account for only 6 percent of the total lifetime loan value among these programs (SEEAaction 2014).
- **Bond issuance (for municipal utilities only):** Many states and local governments are using bond financing to pay for clean energy investments. Bonds are debt security, attracting investors by packaging the cash flows from loans into widely tradable liquid instruments in the financial markets. General obligation bonds, which are backed by the full faith and credit of the municipality, usually receive very favorable ratings and low borrowing costs. These bonds are typically repaid from general revenue.
- Among the lowest cost public financing tools are qualified energy conservation bonds (QECB) as the U.S. Department of the Treasury subsidizes the issuer's borrowing costs. QECBs enable qualified state, tribal, and local government issuers to borrow money at attractive rates to fund energy conservation projects. QECB proceeds can be used to fund capital expenditures on a variety of projects, including a green community program such as residential energy-efficiency loans.¹ To ensure that bonds are being used appropriately, QECB issuers should consider requesting an opinion of qualified and experienced bond counsel that the bonds will qualify according to the IRS/Treasury QECB requirements. A QECB issuance may take several months or possibly longer to structure, market to lenders, price, and close.
- **City millages (for municipal utilities only):** Millage rates are the amount per \$1,000 that is used to calculate taxes on property. According to 1893 General Property Tax Act (PA 206), imposing a new millage requires a ballot measure detailing how and why the millage is needed.
- **Private lending institutions:** Private banks, community development financial institutions, and credit unions are a growing option for deploying large amounts of capital to support energy-efficiency financing. These private entities can underwrite, fund, and service residential energy-efficiency retrofit loans. The utility could collect the loan repayment on the utility bill. Programs that use private capital can readily get to scale, but coordination between financial institutions and utilities can be complex and costly.
- **Foundations and charitable organizations:** Several national and regional foundations have provided seed funding for various energy-efficiency programs that can pilot innovative approaches. In many cases, demonstrating a commitment to serving underserved or difficult-to-reach target audiences is a priority for these organizations.

The following table summarizes the various potential sources of capital and their associated benefits and challenges.

Sources of Capital	Potential Benefits	Potential Challenges
Internal utility reserves	<ul style="list-style-type: none"> • Most flexible resource. • Exhibits a strong commitment and leadership to community sustainability goals. • Can leverage significant private capital. • Utility has more control and involvement in the process. 	<ul style="list-style-type: none"> • Limited resource. • Utility cost and risk can be significant, and the cost of capital can be high. • May need to blend with other sources of capital to make program scalable. • Less apt to have consistency in a statewide program, causing confusion with contractors and homeowners. • Requires utilities to develop experience with lending requirements, which is not their strength or desire.
Public funds	<ul style="list-style-type: none"> • Similar benefits as utility reserves. • Low interest rates, including interest-free options. • Longer-term loans for customers. 	<ul style="list-style-type: none"> • May come with strict federal/state restrictions and requirements. • Public models do not educate the capital markets about the energy-efficiency benefits. • Potentially limited to certain geographic areas, as defined by the enabling legislation or regulation. • Administrative or "soft costs" to create on-bill programs are usually capped. • Financed projects must often be cost effective as defined by federal/state rules. Cost effectiveness could vary between different federal/state agencies and exclude certain improvements. • Government bureaucracy and paperwork requirements could serve as a disincentive for utility participation.
Ratepayer funds	<ul style="list-style-type: none"> • Similar benefits as utility reserves. 	<ul style="list-style-type: none"> • May be considered by ratepayers as a "tax." • Greater risk concern; hard to gain approval of oversight boards.
Bond issuance	<ul style="list-style-type: none"> • Enables low interest rates. • Backed by the underlying designated revenue streams. • Longer-term loans for customers. • Can be used to replenish capital. 	<ul style="list-style-type: none"> • Adds to public debt burden. • Ramping up the number of projects to justify bond issuance takes time and transaction expense. • Requires experienced bond counsel. • Expensive for small issuances.
City millage	<ul style="list-style-type: none"> • Similar benefits as utility reserves. 	<ul style="list-style-type: none"> • Must be approved by ballot measure in most cases. • Justifying the city millage takes time and transaction expense.
Private lending institutions	<ul style="list-style-type: none"> • Significantly leverages limited resources. • Can evolve to a more sustainable, market-based approach. • Convenience of loan repayments on existing utility bill, rather than new lender bill. 	<ul style="list-style-type: none"> • Least flexible. • May require more restrictive underwriting and product terms. • Will seek senior or pro rata treatment for repayments.
Foundation and charitable organizations	<ul style="list-style-type: none"> • Program-related investments may allow for below-market interest rates. • May have flexible granting requirements. • May be interested in providing capital to a nonprofit that can hold consumer loans. 	<ul style="list-style-type: none"> • Funds may have geographic and/or mission-related restrictions. • Amounts may be too small to be used as loan capital; funds may be better suited for start-up costs. • Administrative time to seek out funding, prepare proposals and manage grants.

Credit Enhancements

A credit enhancement is a form of risk management; it protects the financial exposure of a lender to losses in the case of a borrower default or delinquency. A credit enhancement can be a pool of funds, such as a portion of the total dollar amount of the outstanding loans, which is placed in a reserve and functions as insurance. Depending on the target market and pro-

gram design, a range of credit enhancement tools are available to program administrators. The two most common credit enhancements are loan loss reserves (LLRs) and loan guarantees.

- **Loan loss reserves:** An LLR is a limited pool of funds from which a financial entity can recover a portion of their losses in the event of borrower defaults.
- **Loan guarantees:** A loan guarantee enables lenders to recover all potential losses due to defaults.

Methods for Assessing Creditworthiness

Assessing program applicants' creditworthiness can influence program participation rates and program administrative costs. On-bill programs often utilize one or more of the following primary metrics to assess creditworthiness:

- **Credit score:** Minimum credit scores required for on-bill programs range from 590 to 640.
- **Debt-to-income (DTI) ratio:** A maximum DTI ratio of between 50 percent and 70 percent is common.
- **On-time utility bill payment:** An on-time payment history for the past one to three years is common.

Evaluations of on-bill programs in operation across the country show default rates are very low, between 0 and 3 percent. These default rates are comparable to default rates of traditional financing programs. For example, the Michigan Saves Home Energy Loan Program, an unsecured energy-efficiency and renewable energy loan program that uses private capital and traditional loan repayment, has experienced a 2 percent default rate since its inception in 2010.

The ability to assess creditworthiness with alternative underwriting criteria, namely utility bill payment history, may expand access to and increase approval rates for financing and is one of the benefits to on-bill financing. A 2014 review of on-bill programs across the country found that the one program that relies on traditional underwriting criteria rejects about eight times as many applications as those that rely primarily on strong utility bill repayment history, with no impact on default rates. In addition, using alternative underwriting criteria as a proxy for creditworthiness is less costly and time intensive than using traditional metrics. Programs that use utility, ratepayer, nontraditional lender, and public capital are more likely and amenable to incorporate alternative underwriting than those that do not. While using alternative criteria has been shown to increase approval rates without increasing default rates, it is unclear if investors will accept this form of assessing credit (SEEACTION 2014).

Loan or Tariff Structure

On-bill programs usually provide financing through a loan instrument and associated legal documents. But some programs are now providing financing in the form of a voluntary tariff.

- **On-bill loans:** Like personal or business loans, on-bill loans are usually nontransferable and must be paid off at the time ownership changes hand. In South Carolina, however, a law was passed allowing loans to be attached to the meter. Seattle City Light and the Holland Energy Fund also allow loans to transfer to the next utility customer after a home is sold.
- **Tariff-based financing:** The loan installment charge is tied to the meter, not the homeowner. The homeowner repays the loan over time through a surcharge on their electric bill, but it is not a traditional personal loan. If the ownership of the home is transferred, the loan installment charge can be transferred as well, allowing the repayment period to extend beyond the current homeowner to the new owner. The next customer connected to that meter continues to pay the financing (EESI 2015). The tariff structure may motivate landlords who don't want to take on financing energy improvements because they will not realize the benefit. It may also entice people with short time horizons to invest in energy improvements, since the obligation will automatically transfer to the next occupant. However, an evaluation of on-bill programs that allow the obligation to transfer found that half or more cleared the tariff (i.e., paid the balance) before selling the property (SEEACTION 2014).

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Consequences of Nonpayment

Program administrators will need to decide whether nonpayment can lead to the disconnection of energy service. This often depends upon state laws or utility regulations. In Michigan, PA 342 and PA 408 designate that electric service may be shut off for nonpayment in the same manner used to enforce nonpayment of other charges for electric service. Although utility disconnection for nonpayment is not used for all on-bill programs, it is one of the most common consequences of nonpayment. For programs that do not allow utility disconnection, the most common consequence is legal action to obtain funds, such as a lien on the property.

One of the perceived benefits of on-bill programs is the added security afforded by threat of service disconnection for nonpayment. Default rates for on-bill financing programs are similar to off-bill clean energy financing programs and lower than default rates on other consumer debt. There is no real difference in default rate between on-bill programs that allow utility service disconnection and those that do not (SEEAAction 2014). When designing an on-bill program, program managers need to decide what takes precedent for partial payments—the bill or the loan.

Section Three: Program Administration

Offering an attractive financing product (e.g., low interest rate, longer loan terms) can be an important aspect to overcoming barriers to energy efficiency—but that is just one component of an on-bill program. Attaching attractive financing to an ineffective program will not produce results. This section outlines key program administration tasks that are essential to running a successful on-bill program.

Driving Demand for an On-bill Program

Defining a Target Market

Clearly defining a target market for your on-bill program can play an important role in the program outcome because it can concentrate marketing and outreach in areas that will generate the most participants. Often, on-bill programs target customers with higher than average energy bills or customers with complaints of high bills because these homes are the most likely candidates for whole-home retrofits. Some on-bill programs identify participants through more detailed research about their local market. For example, program administrators from Seattle City Light collaborated with real-estate agents to promote the Community Power Works program to new homebuyers in Seattle—a region experiencing rapid population growth. This is because, according to the National Association of Home Builders, buying and moving into a new home often triggers increased remodeling activities. Energy-efficiency upgrades are often easier to perform while other remodeling activity is taking place (NAHB 2013).

There is no real difference in default rate between on-bill programs that allow utility service disconnection and those that do not (SEEAAction 2014).

Marketing and Outreach

Marketing efforts should be in line with program penetration goals. A program intended to reach certain customers can utilize targeted marketing approaches, such as direct mail or cold calls. Traditional advertising; utility bill inserts; social media; and marketing through a strong contractor network; as well as partnering with trusted community-based organizations, such as schools, churches, and local nonprofits, are common strategies for promoting on-bill programs.

Word-of-mouth and customer-to-customer promotion of on-bill programs are also common. Aiken Electric Cooperative in South Carolina runs a residential on-bill program called Help My House! Aiken has issued more than \$1.4 million in loans to finance home energy upgrades, and word-of-mouth is the primary way that program participants report learning about and signing up for the Help My House! program.

The RePower Program in Kitsap County, Washington asked program participants to place a yard sign in their lawn promoting their engagement in the program.



Developing and Managing a Network of Local Contractors

Successful retrofit programs rely on a highly skilled and motivated pool of contractors. In some markets, home performance contractors that specialize in whole-house retrofits have become well established. Contractors can contribute to the success of on-bill programs in several ways, including:

- Supporting initial program design
- Marketing the program to potential customers
- Providing quality upgrades and establishing a high level of customer satisfaction

Program administrators should assess their local workforce and ensure that there is a pool of contractors large enough to meet program goals. Program administrators should also determine the requirements contractors should meet to participate in the program (e.g., home performance certifications, licenses, and insurance minimums). For Michigan, PA 408 and PA 342 require all customers to receive a baseline home energy audit, performed by a qualified person using building performance diagnostic equipment, that complies with the American National Standards Institute (ANSI) home energy audit standards. This requirement could limit the implementation of on-bill programs, particularly in rural areas, where there may not be any contractors who can perform an ANSI-approved home energy audit.

A contractors' program manual that establishes expectations, regular trainings, and frequent communication will help ensure optimal performance and participation from contractors. Program administrators may need to fund specialized training and equipment for contractors to meet statutory requirements.

A program intended to reach certain customers can utilize targeted marketing approaches, such as direct mail or cold calls.

Measure Screening

How will eligible measures be identified? Unless it is a basic appliance upgrade, diagnostic and energy auditing tools—as well as trained auditors—are almost always needed to identify appropriate and cost-effective measures for the home. As stated above, PA 408 and PA 342 require a home energy audit. The enacted legislation states that the audit must meet the following requirements: (i) determines how best to optimize energy performance while maintaining or improving human comfort, health, and safety and the durability of the structure; (ii) includes a baseline energy model and cost-benefit analysis for recommended energy-efficiency improvements.

There are several organizations that set technical standards for home energy auditing and energy-efficiency upgrades, as well as provide certifications for contractors, including the Building Performance Institute and the Residential Energy Services Network. [The Department of Energy maintains a highly comprehensive database](#) that tracks tools available for whole-house energy analysis. The Home Energy Rating System, Energy Performance Score, OptiMiser, and the National Energy Audit Tool are common audit tools that are used for on-bill programs.

According to SEEAAction, programs that have significant loan volume allow for a broad array of measures and are not prescriptive about how the measures are packaged. Programs that are more restrictive and prescriptive (e.g., require bill neutrality, whole-home energy improvements) have lower loan volumes, but may achieve other program goals, such as deep energy savings. On-bill programs that have been successful in both meeting the goal of high customer participation and deep energy saving have offered substantial financial incentives (e.g., 0 percent interest, large rebates).

Setting Quality Assurance Standards

Quality assurance and quality control (QA/QC) are paramount to a clean energy program. Poorly done work may not only damage the home but can also endanger the resident. Home energy programs must improve the health and comfort of the resident and meet local, state, and national standards. Program administrators should set standards, develop a QA/QC procedure, and contract with a home performance expert that can monitor and evaluate contractors' work. Many programs do 100 percent QA/QC with new contractors. Once a contractor becomes a trusted provider, the program can transition to random QA/QC visits after a probationary period has been successfully completed. PA 408 and PA 342 require the utility to develop and document procedures for QA and antifraud measures, as well as procedures for obtaining verification that the equipment was installed and operates as intended.

Third-party Implementation Partners

Many on-bill programs hire implementation partners to support program administration. According to PA 408 and PA 342, on-bill programs may be administered by the utility provider or a third party, such as a nonprofit corporation, or commercial lenders. Contracting with a financial institution that administers loans and manages compliance burdens and risks is common for on-bill programs. Contractor management and quality assurance activities are also often outsourced to consulting firms or nonprofits that specialize in pro-

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In Michigan, PA 408 requires that a home energy audit be conducted.

gram administration of public-facing resource conservation programs. Selecting a third-party administrator via a competitive request for proposals process can help keep costs affordable. Deliverables-based contracts with set budget ceilings for specific outcomes, rather than time and materials contracts, can limit a utility's risk exposure.

Data Management and Evaluation, Measurement, and Verification

Like all clean energy improvement programs, evaluation, measurement, and verification (EM&V) allows program managers to compare program design assumptions and real world performance. Setting up data management systems prior to program launch is essential to gathering accurate information about program performance. Data management systems should be configured to help evaluate the following tasks and program components:

- **Required reporting:** Depending on the source of capital used to run the program (e.g., federal grant), it is possible that a utility will need to provide specific reporting metrics to a funding agency or foundation.
- **Customer satisfaction:** With a new program, it is helpful to follow up with participants directly after the retrofit is complete to capture immediate reactions and feedback. Follow-ups should also take place a year after the customer has experienced all four seasons in the newly retrofitted home.
- **Billing impacts:** How has participating in the on-bill program impacted participants' bills? Did the program result in bill neutrality for participants?
- **Program goals:** Quarterly and annual program metrics should be evaluated to determine if overall program goals are being met.

CASE STUDIES

The following sections profile five on-bill programs from across the country.

The City of Tallahassee Utilities (Florida) has been running a successful on-bill financing program since 1983. The program has enabled the utility's customers to perform energy-efficiency retrofits and other energy projects on their homes with no up-front costs. Over the program's lifetime, it has loaned \$130 million for 17,000 retrofits, averaging 550 retrofits and \$4 million in loans each year. This translates into an 18 percent participation rate among 97,000 utility customers.



City of Tallahassee Utilities: Energy Efficiency Loan Program

The utility raised several million dollars in capital for the program before and after its launch through the utility's ratemaking process. When setting the rates for the following year, the utility would set rates higher than its forecasted need, creating an overage. These overage funds were used to capitalize the on-bill loan fund.

Customers may borrow up to \$10,000 (\$20,000 if solar PV or cool roofs are included) at a 5 percent interest rate plus 1 percent processing fee, which help build the revolving loan funds. Customers repay the loans through the monthly utility bill as a differentiated line item over five years (ten years if solar PV or cool roofs are included). The utility's loan is secured with a property lien recorded at the county courthouse, and the loan must be paid in full if the house is sold—the debt is not transferable. The default rate for the on-bill program has been very low, at about 1 percent.

Eligible upgrades include HVAC replacement, appliances, clothes washers, weatherization measures, pool pumps, room ACs, water source heat pumps, and electric vehicle home charging stations. Free home energy audits are available, but not required for participation.

Tallahassee's on-bill loan program has no income eligibility requirements nor traditional credit checks. Instead, residential participants must have one year of good bill payment history. A customer's eligibility to participate in the loan program is determined in part by the utility credit rating for that customer's utility account. A perfect Tallahassee Utility credit rating is 1,000 points, and most customers have that score. Points are deducted for late payments, returned checks, unfulfilled payment plans, and shut offs for nonpayment. Points can be earned back with each on-time monthly payment. Late payments cost 200 points per incident, which requires 24 months of on-time payment to completely earn back. Generally, a score of 800 is required for loan eligibility. or, if the customer's payments are made via bank draft, a score of at least 499. Loans are denied for any applicant that has declared bankruptcy or faced foreclosure within the past seven years.


A key to the program's success is the participation of trained contractors and installers, as there is minimal direct program marketing from the utility.

For rental properties, retrofits can be financed through loan payments on the meter of the property owner's primary residence. Participation among manufactured housing communities has been low, likely due to the home ownership requirement.

A key to the program's success is the participation of trained contractors and installers, as there is minimal direct program marketing from the utility. When a customer calls a contractor to replace a broken HVAC system, for instance, the contractor informs the customer about the on-bill financing program. If the customer decides to participate, the contractor has them sign a promissory note detailing the interest rate and terms. The utility then pays the contractors once the energy-efficiency retrofits have been installed at the customer's property and the final inspections have been passed.

Key Program Metrics Summary

See Appendix A for a summary of key program metrics.



Eugene Water and Electric Board (EWEB) Energy Efficiency Loan Program

The Eugene Water and Electric Board (EWEB), the electrical municipal utility of Eugene, Oregon, has operated an on-bill financing program since 1995. The Energy Efficiency Loan Program (EELP) covers energy-efficiency improvements, water conservation, and water line or septic tank failures. The program offers a wide array of zero-interest energy-efficiency loans for residents, renters, multifamily housing, and small businesses. The loans are then repaid as part of the recipient's utility bill.

The EELP is part of the City of Eugene's efforts to drastically reduce carbon dioxide emissions by 2050. In 2010, Eugene's city council approved a Community Climate and Energy Action Plan. That plan mandates the city to reduce community-wide greenhouse gas emissions to 75 percent below 1990 levels by 2050, reduce community-wide fossil fuel use by 50 percent by 2030, and identify strategies that will help the community adapt to a changing climate and increasing fossil fuel prices. While 90 percent of EWEB's electricity generation is hydropower, climate change is expected to reduce summer hydroelectric power generation capacity (due to lower snow-pack levels and lower stream flows in the summer). At the same time, increases in average summer temperatures will produce greater energy demand. By reducing energy consumption in existing buildings, the city and EWEB are preparing themselves for this more challenging environment.

Through the EELP's residential program, EWEB offers five distinct 0 percent interest energy-efficiency loan packages: water heater, pool water heater, weatherization, heat pump and duct sealing (ductless heat pumps are also eligible), and new high-performance window installation. Each loan package has a \$4,000 maximum loan amount, which must be repaid in five years. A participating customer can combine multiple loan packages for a maximum possible loan of \$20,000. The loans are a supplemental offering to energy-efficiency rebates that EWEB has offered since the early 1980s. Successful loan applicants are also eligible for a \$600 cash discount for domestic water heaters and \$0.40 per square foot rebate for insulation.

The original source of capital for the program was a \$200,000 seed allocation from utility revenues, with additional capital from conservation bond refinancing. Today, EWEB's loan pool is a fixed revolving fund that recycles as participants pay the loan principal. Additionally, EWEB uses its own utility loan borrowing authority to borrow capital for the program. The interest on the utility loans is always lower than the interest applied to the commercial EELP, which currently is at 4 percent. The initial allocation and the interest on the commercial loans allows for EWEB to keep the residential EELP rate at 0 percent.

EWEB reports that engagement with the contractors and their customers has been crucial in high customer participation and satisfaction rates.

Since 1995, EWEB has financed approximately \$50 million across its loan programs and finances between 500 to 1,000 loans per year. In 2014 alone, 1,000 residential loans were approved. The EELP also financed 15 to 20 small commercial loans, all of which are larger than the residential loans.

Eligibility for the residential and commercial programs is based on ownership. The owner of the property needs to be the point of contact for EWEB and must assume the loan through the utility meter once work is completed. Eligible properties are detached, single-family dwellings; duplexes; triplexes; and quads. For multifamily rental properties of four units or more, EWEB provides a \$4,000 loan for the first rental unit, and \$500 per additional unit for a cap of \$20,000.

For the loan underwriting, EWEB uses a hybrid method that factors in both credit score and bill payment history for the prior 12 months. There is no minimum credit score to qualify, but rather a range of scores depending on the customer's bill payment history. EWEB retains the authority to shut off service for nonpayment of the on-bill loans, according to municipal code. The power of disconnection provides incentives for participants to continue repaying the loans, and thus, the utility feels there is no need for a LLR. Additionally, loans are secured through a property lien, filed through Lane County offices. The threat of disconnection coupled with the loans repaid through the meter has kept the delinquency rate under 1 percent.

EWEB reports that engagement with the contractors and their customers has been crucial in high customer participation and satisfaction rates, which has led to good word of mouth. EWEB has a contractor administrator who serves as the participating contractors' point of contact and authorizes interested contractors to be part of the list that EWEB provides to EELP loan recipients. EWEB does not recommend or endorse contractors to EELP participants as a way to maintain barriers between contractors, customers, and the utility.

Key Program Metrics Summary

See Appendix A for a summary of key program metrics.



Seattle City Light Community Power Works Program

Seattle City Light is a municipal electric utility that serves more than 350,000 customers. In 2011, Seattle City Light partnered with the city's Office of Sustainability and the Environment and Craft3, a nonprofit community development finance institution, to create an on-bill financing program for residential energy-efficiency improvements. By making repayment convenient and lowering up-front costs through low-cost financing, the project aims to increase energy retrofit upgrades for low-income households.

In the program, Seattle City Light acts as a pass-through entity, directing interested applicants to Craft3, which provides and services the actual loans. Once Craft3 approves the loan and the work is completed, loan payments are added to the customer's Seattle City Light monthly utility bill as an itemized line item.

Loans provided by Craft3 are available for up to \$30,000 at interest rates of either 3.49% (for lower-income households) or 4.49% APR. The loan terms are up to 20 years, with no other additional fees or prepayment penalties. The loan is attached to the meter and can be transferred to the next occupant when the house is sold, or it can be bought-out at closing.

Loans are made for energy-efficiency projects in single-family homes and small multifamily units, with allowances for low-income households and long-term renters. Eligible upgrades include heat pumps, attic and floor insulation, air sealing, and other weatherization measures. Seattle City Light also provides rebates of \$1,200 for heat pumps, \$250 for water heaters, and \$250 for weatherization measures.

Since 2011, the program has financed 376 on-bill loans, totaling approximately \$5 million. Project participants have seen an average of 25 percent electricity savings. Electrically heated homes generate 56 percent of total electricity savings to date and represent 44 percent of the borrowers. Also, 30 percent of Craft3's loans qualified for the 3.49 percent subsidized interest rate.

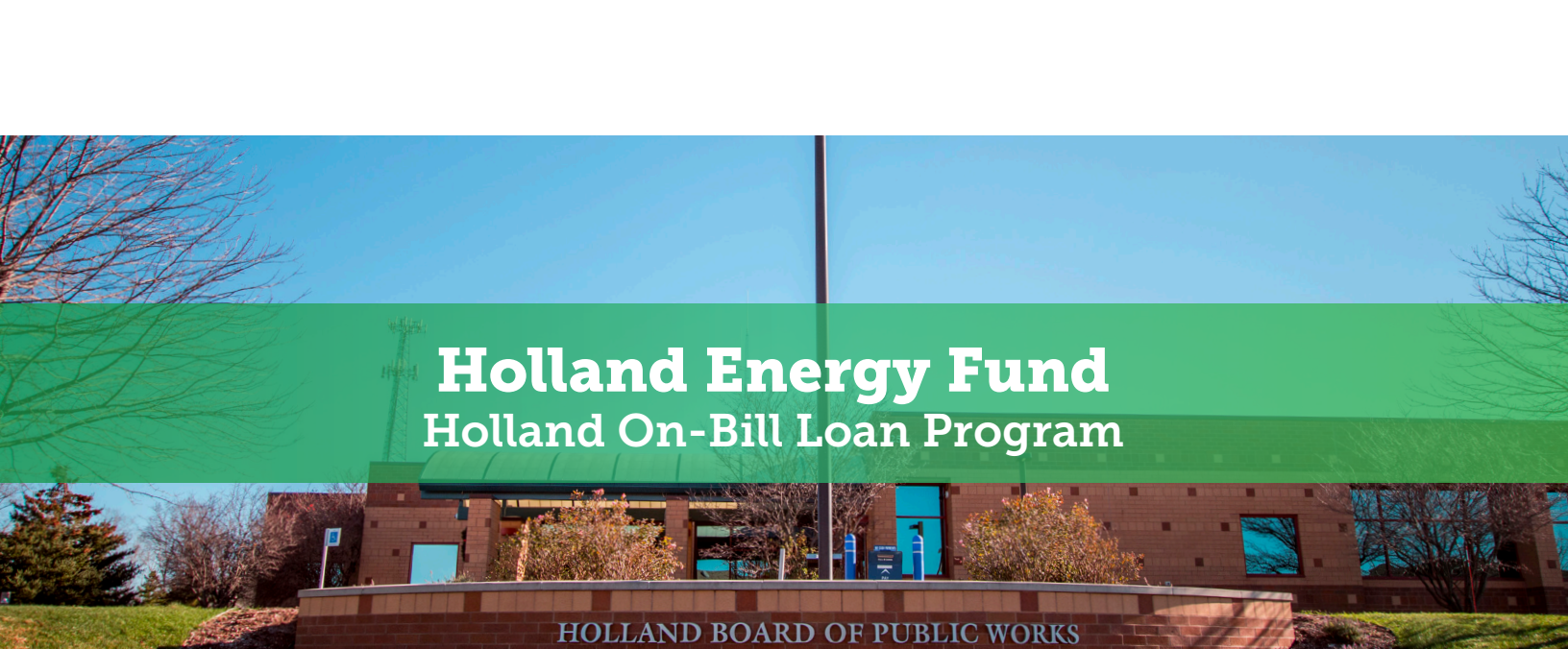
For the loan underwriting, Craft3 uses a hybrid method that factors in the applicant's bill payment history and a credit check. Customers with credit scores as low as 590 may be eligible to participate if the applicant has a good bill payment history. In case of nonpayment, Seattle City Light has authority to proceed with utility disconnection, and Craft3 has the power to pursue legal action to obtain any funds that are not paid. With these measures in place, there have been no defaults to date.

By making repayment convenient and lowering up-front costs through low-cost financing, the project aims to increase energy retrofit upgrades for low-income households.

The Craft3 loan program is part of the city's broader Community Power Works (CPW) energy-efficiency program, which includes efficiency rebates and free weatherization grants for low-income households. The City of Seattle and Seattle City Light received a \$20 million grant from the U.S. Department of Energy's Better Buildings Neighborhood Program, which provided the seed money for CPW. The CPW program, which embeds the Craft3 loan product as part of its portfolio, serves as the overall program administrator and manages contractors and quality assurance.

Key Program Metrics Summary

See Appendix A for a summary of key program metrics.



Holland Energy Fund

Holland On-Bill Loan Program

Holland Energy Fund Inc. was incorporated as a nonprofit corporation to facilitate and finance aspects of the City of Holland's comprehensive, long-range Community Energy Plan to become a world-class leader in energy security, affordability, sustainability, and efficiency.

The plan includes several large-scale projects. One such project is to substantially increase the energy efficiency of Holland's 7,400 single-family homes. Energy-efficiency investments are a cost-effective means to decrease energy consumption, enhance building comfort, and reduce utility bills.

Despite the benefits of energy-efficiency investments, high up-front costs can be a significant barrier to investing in home energy improvements. A program that allows customers to repay financing for these improvements (by adding incremental payments to their utility bills) is one way to overcome this cost barrier.

The goal of the Holland Energy Fund's On-Bill Loan Program is to strengthen community and neighborhood by:

1. Encouraging deep energy savings
2. Increasing access
3. Administratively operating in a cost-effective manner

Under the Holland Energy Fund On-Bill Loan Program, owners of residential buildings (four units or less) within the City of Holland can finance any eligible energy-efficiency improvement. City of Holland residents can borrow between \$5,000 and \$30,000. Customers will receive an interest rate of 4.99% if they select a term up to ten years. Customers who select a term between ten and 15 years will receive a 5.99% interest rate. The interest rate is set periodically by the Holland Energy Fund Board of Directors and, per statute, can never exceed the prime interest rate plus 4%.

The primary underwriting criteria is that the customer must have 12 consecutive months of on-time, electric utility bill payment history. Also, the customer may not have any delinquent taxes, bankruptcies, foreclosures, or repossessions greater than \$1,000 within three years (from discharge), and no unsatisfied money judgements.

Customers repay the loan through a per-meter charge on the monthly electric bill. The payment is considered part of the charges for electric services to the property. Thus, nonpayment of the loan can trigger disconnection of electric service.

Despite the benefits of energy-efficiency investments, high up-front costs can be a significant barrier to investing in home energy improvements. A program that allows customers to repay financing for these improvements (by adding incremental payments to their utility bills) is one way to overcome this cost barrier.

The loan is unsecured and may be added to a customer's tax bill and enforced against the property through the tax lien foreclosure process in the same manner and with the same priority as the charges for electric service and real property taxes. Notice of the loan is recorded with the county register of deeds. The loan obligation runs with the land and is binding for future customers contracting for electric service to the property.

The improvements must be implemented by an authorized contractor following the completion of a comprehensive, whole-home energy audit. Eligible energy-efficiency improvements include any measure or piece of equipment that has energy savings documented in the Michigan Energy Measures Database, such as air conditioners, air sealing, air-source heat pumps, appliances, boilers, doors, furnaces, geothermal systems, insulation, roofs, skylights, water heaters, and windows. Renewable energy improvements are permitted once a home exceeds a Home Energy Score of eight, as defined by the U.S. Department of Energy.

The Holland On-Bill Loan Program was launched in November 2016 and has shown early success. In the first five months of operations, nearly 50 customers have applied for financing, with 77 percent of customers being approved.

Key Program Metrics Summary

See Appendix A for a summary of key program metrics.



Midwest Energy's How\$mart Program

Midwest Energy, located in central and western Kansas, is an electric and gas cooperative that serves 48,000 electric customers and 42,000 gas customers. Midwest has one of the longest running tariff-based on-bill financing programs in the country called How\$mart.

How\$mart was launched because—despite a long track record of investments in energy-efficiency programs and services—most Midwest members were not making meaningful energy-efficiency upgrades due to high first costs and a lack of access to affordable financing. This was especially the case among rental and low-income member segments where, over the course of several years, Midwest employees would often audit the same structure more than once, making the same efficiency improvement recommendations because measures were never implemented (ACEEE 2008). Energy performance contractors facing the same market barriers also consistently asked Midwest Energy to offer energy-efficiency finance options to members. To address these challenges, Midwest launched the How\$mart program as a pilot in 2007, and later expanded the program to the entire Midwest service territory in 2008 for both residential and commercial members.

As long as all measures are deemed cost-effective, the How\$mart program requires no up-front capital from building owners. Efficiency improvements are paid for through a surcharge on the utility bill that is tied to the location rather than to the individual customer. Because How\$mart is a tariffed utility service, this gives Midwest the ability to disconnect for nonpayment.

Members often learn about How\$mart after they contact Midwest regarding bill concerns or complaints. Contractors are also a strong marketing force for the program. After a member contacts the program and Midwest confirms that the member is current on their utility bill payments (the only underwriting criteria for the program), the next step is a high-level screening of energy usage. In most cases, this leads to a comprehensive on-site audit and a list of recommended efficiency improvements, estimated costs, and projected energy savings. There is no charge for the audit if the member decides to participate in the program. Next, members solicit participating contractors to provide bids. Once a bid is finalized—including the total costs of the improvements and estimated utility bill savings—the How\$mart monthly charge is calculated. This surcharge is the repayment mechanism that allows Midwest to recover the cost of the efficiency measures plus the cost of capital. The current interest rate for residential customers is 3% over 15 years; for commercial customers, it is 4.5% over ten years.

How\$mart was launched because—despite a long track record of investments in energy-efficiency programs and services—most Midwest members were not making meaningful energy-efficiency upgrades due to high first costs and a lack of access to affordable financing.

Through September 2015, the How\$mart program has conducted 2,200 audits that have resulted in 1,411 energy-efficiency upgrades (primarily in the residential sector), producing total energy savings of 3.1 million kilowatt hours of electricity and 385,745 therms of natural gas. The total loan value of the program is approximately \$8.2 million.

Although a major impetus for the creation of the How\$mart program was to overcome market barriers in rental and low-income markets, the program struggled to serve this demographic initially. According to Brian Dreiling, energy services manager at Midwest Energy, part of the problem is that low-income members often have such high energy bills that they cannot stay current with their bill payments and, as a result, cannot qualify for the program. In response to this issue, How\$mart recently partnered with the federal weatherization program so that there could be more coordination regarding efficiency efforts. "We don't want to duplicate efforts. For example, the federal weatherization program is conducting the audits for many of our low-income members, and we are happy to use their audit results. When the low-income weatherization program can cover the cost of some of the efficiency upgrades, it reduces the risk to Midwest," said Dreiling. As a result of this partnership, as well as more targeted marketing and outreach to landlords and rental companies, the annual number of low-income or renter participants has increased to roughly 20 percent.

Key Program Metrics Summary

See Appendix A for a summary of key program metrics.

Appendix A

Summary of the Key On-bill Financing Programs

	City of Tallahassee Utilities Energy Efficiency Loans 1983	Eugene Water and Electric Board Energy Efficiency Loan Program 1995
Meter Attachment Feature	Line item billing with disconnection for nonpayment	Line item billing with disconnection for nonpayment
Market	<ul style="list-style-type: none"> Residential Small commercial Multifamily Rental units are eligible. Landlords can make loan payments on meter of primary residence. 	<ul style="list-style-type: none"> Residential Small commercial Multifamily Rental units are eligible, but loan is with the owner.
Capital Source Details	Utility ratemaking was used to create a revolving loan fund.	Utility reserves and conservation bond refinancing were used to create revolving loan fund. EWEB also uses its own utility loan borrowing authority to borrow capital for the program.
Credit Enhancement	None	None
Transferability	<ul style="list-style-type: none"> No. Loans are not transferable and are due upon sale of the property. Loans are secured with a property lien recorded at the county. 	<ul style="list-style-type: none"> No. Loans are not transferable and are due upon sale of the property. Loans are secured with a property lien recorded at the county.
Underwriting	<ul style="list-style-type: none"> One year of strong utility bill payment history No bankruptcy or foreclosures within past seven years 	<ul style="list-style-type: none"> Credit scores One strong year of utility bill payment history
Rate, Max Term, and Max Amount	<ul style="list-style-type: none"> 5% plus 1% processing fee 5 years (10 years for solar PV and cool roofs) \$10,000 (\$20,000 for solar PV and cool roofs) 	<ul style="list-style-type: none"> 0% for residential loans; 4% for commercial 5 years \$20,000 by combing several smaller loans
Default Rate	1%	<1%
Loan Value	\$130 million	\$50 million
Participants	17,000	12,500
Annual Loan Value	\$4 million	\$2–4 million

Seattle City Light Community Power Works Program 2011	Holland Energy Fund Holland On-Bill Loan Program 2016	Midwest Energy HowSmart Program 2007
Line item billing with disconnection for nonpayment	Line item billing with disconnection for nonpayment	Line item billing with disconnection for nonpayment
<ul style="list-style-type: none"> Residential Small multifamily units. 	<ul style="list-style-type: none"> Residential Rental units are eligible, but loan is with the owner. 	<ul style="list-style-type: none"> Residential Commercial
Third-party (Craft3) financing loans; federal grant funds	Holland Board of Public Works	Utility capital and federal loan funds
None	None	None
<ul style="list-style-type: none"> Yes. Loans are transferable to the next occupant. 	<ul style="list-style-type: none"> Yes. Loans are transferable to the next occupant. Notice of loan is filed with the county register of deeds. 	Yes. Loans are transferable to the next occupant.
<ul style="list-style-type: none"> Credit scores, as low as 590 One strong year of utility bill payment history 	<ul style="list-style-type: none"> Twelve consecutive months with no delinquencies on electric utility bill payment history No delinquent taxes No bankruptcies, foreclosures, or repossessions greater than \$1,000 within three years (from discharge) No unsatisfied money judgements 	Member must be current on their utility bill payments
<ul style="list-style-type: none"> 3.49% (for lower-income households) or 4.49% 20 years \$30,000 	<ul style="list-style-type: none"> 4.99% for loans with terms up to ten years 5.99% for loans with terms up to 15 years \$5,000 minimum loan amount \$30,000 maximum loan amount 	<ul style="list-style-type: none"> 3% with a term up to 15 years for residential loans 4.5% with a term up to ten years for commercial loans
None	None	<1%
\$5 million	\$150,000	\$8.2 million
376	10	1,411
	\$150,000	\$1.2 million

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