

BAYREN

Local Governments Empowering Our Communities



2019 Energy Efficiency Annual Report

BayREN is administered by the Association of Bay Area Governments (ABAG)

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Executive Summary

The Bay Area Regional Energy Network (BayREN) is a collaboration of the nine counties that make up the San Francisco Bay Area. Led by the Association of Bay Area Governments (ABAG), BayREN is a program administrator (PA) that implements energy saving programs on a regional level for the single family, multifamily, and commercial sectors, as well as programs for water-energy savings and codes and standards. BayREN draws on the expertise, experience, and proven record of Bay Area local governments to offer effective programs that address energy efficiency, climate change, health, and sustainability. This annual report is timely submitted based on the granting of an extension by Administrative Law Judge Valerie U. Kao on April 13, 2020, for BayREN and the other non-Investor Owned Program Administrators REN/CCA program administrators an extension to file their 2019 Energy Efficiency Annual Reports no later than May 1, 2020.

BayREN is funded by California utility ratepayers under the auspices of the California Public Utilities Commission (CPUC), as well as through grants and funding from member agencies, other state and federal agencies, and foundations. One of three Regional Energy Networks in the state, BayREN represents 20% of the state's population.

Since its inception, BayREN has been addressing the three areas indicated by CPUC Decision (D.) 12-11-015 in the formation of the RENs: filling gaps that the investor-owned utilities (IOUs) are not serving; developing programs for hard-to-reach markets; and piloting new

BayREN Achievements to-date:

- 3.7 Trillion BTUs Energy Saved.
- 126.6 Million Tons of Carbon Avoided.
- 47,300 Housing Units Upgraded.
- \$48.9 Million in Incentives Awarded.

Programs exceeded 2019 goals:

- Provided Technical Assistance to property owners of over 11,500 multifamily housing units.
- Upgraded over 5,730 multifamily units, awarding \$4.37M in incentives.
- Served over 6,300 customers and made over 1,300 program referrals.
- Enabled over 2,900 Home+ projects, awarding \$4.2M in incentives.
- More than half of the jurisdictions in the Bay Area (55) participated in one or more of BayREN's Codes and Standards activities.
- 2,400 residents have undergone an energy rating with Home Energy Score.
- Water Upgrades \$ave Pilot Utilities have installed 247 single family and 584 multifamily unit on-bill financed projects.

approaches to programs that can potentially scale and offer innovative avenues to energy savings.

BayREN funding for 2019 was approved in D.16-08-019: "[E]xisting approved activities [of the RENs] may have ongoing funding that was previously approved."¹ Thereafter, in D.18-05-041, BayREN's Business Plan and Budgets² for the term of the Rolling Portfolio were approved with slight modifications. BayREN began to implement portfolio changes to in 2019.

¹D.16-08-019 at page 10.

² <https://www.bayren.org/news/bayren-business-plan>.

BayREN’s programs and services are carefully designed and implemented to go beyond the basics required by the CPUC. BayREN’s local focus and regionally implemented solutions can better connect local communities and their needs than is typically possible from a large utility. In addition, BayREN provides services across jurisdictions that municipal-only programs cannot achieve.

One of the unique and important characteristics of BayREN’s organization is its dynamic and democratic governance system. BayREN is managed through a “Coordinating Circle,” which includes representation from ABAG and all nine Bay Area counties. Each BayREN member agency designates a voting member to the Coordinating Circle. This body makes decisions regarding overall policy, high-level programmatic issues, and budgets. The model has been effective in enabling BayREN to make quick decisions, be flexible, and innovative.

To date, BayREN programs have provided **\$48.9 million in incentives, saved 3.7 Trillion BTUs of Energy and avoided 126.6 Million Tons of Carbon Emissions.**

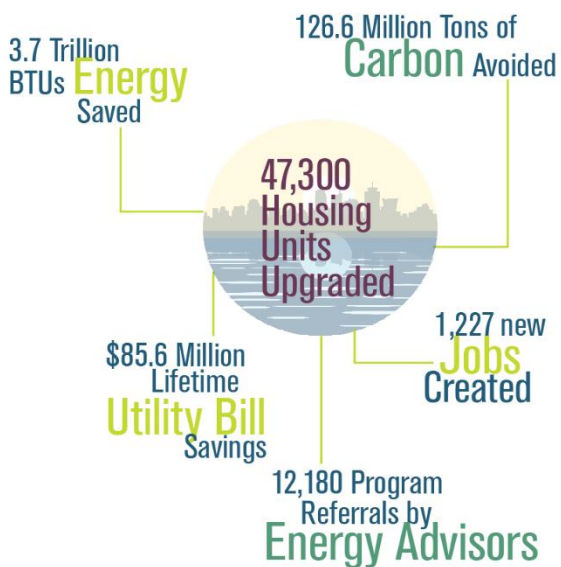


Figure 1: BayREN Accomplishments

BayREN has enhanced the typical incentive program model with customer-focused technical assistance, innovative financing, marketing and outreach, and capacity building services that improve the uptake, satisfaction, and effectiveness of the incentives.

BayREN programs saw continued success in 2019 as highlighted in this report. BayREN offers services in the following three sectors: Residential, Commercial, and Cross-Cutting.

Residential Sector

Single Family Home+

Through Home+, BayREN provides rebates to Bay Area single family homeowners and renters for qualifying measures, an online energy evaluation, no-cost energy efficiency kits and in-home education and direct install services. A key element of this program is the no-cost Energy Advising service in which certified building performance professionals (Energy Advisors) assist with home energy improvements by working hand in hand with customers through the entirety of their project and provide unbiased advice, education, support with contractor selection, installation best practices and home health. Customers are encouraged to work with Program participating contractors who are trained in building science, and who are well versed in maximizing savings and non-energy benefits. Energy Advisors also refer customers to other Bay Area complementary programs that may be more appropriate; the Advisors work hard to ensure customers have a positive energy efficiency experience. Apart from rebates, the Energy Advisor service continues to be our customers’ most valued BayREN offering.

Green Labeling

The Green Labeling program builds upon BayREN’s work in the single family sector and

offers the Regional Home Energy Score (HEScore) Program and provides continuing education and other opportunities for realtors, appraisers and lenders to increase their ability to understand, market and evaluate energy efficient and green homes. The primary objective of the program is to establish integrated and aligned green labeling to increase awareness and transparency of residential energy information, thereby supporting and increasing energy savings in the single family program.

Multifamily Upgrade

This program engages multifamily property owners who are sensitive to the barriers of participating in a rebate program and helps them plan and undertake upgrades. The Program offers no-cost technical assistance and a per-unit flat rebate for multiple-measure energy upgrade scopes that save a minimum percentage of the whole building's energy usage. In 2019, to promote consistency across multifamily rebate programs in the Bay Area, the Program worked with PG&E to offer a participation pathway for smaller PG&E Multifamily Upgrade Program projects.

Commercial Sector

Small and Medium Business (SMB) Commercial

This small and medium (SMB) business program consists of two subprograms: BayREN Business and BayREN Microloan. Together, they empower the SMB sector across the Bay Area by removing barriers to installing energy efficiency upgrades, thereby reducing businesses expenses, while improving equipment reliability, productivity, and business services. The program will allow for continued growth and prosperity, increase customer, contractor and building owners'

knowledge, comfort and enable long-term energy savings in the SMB sector. The goal of the program is to provide SMBs with multiple options to realize energy savings by receiving financial assistance and consistent, centrally managed, project delivery services. Bay Area SMBs are covered through BayREN Business providing no-money down, multi-measure energy efficiency upgrades, or small dollar 0% interest financing with the BayREN Microloan Program.

Cross-Cutting Sector

Codes and Standards

The mission of BayREN's Codes and Standards program is to provide support for and between Bay Area local governments to increase energy performance of buildings by improving energy code compliance, increasing adoption of local energy policies, and ensuring that local government needs, and concerns are considered when state policies are developed.

Water Upgrades \$ave

This innovative water-energy nexus program provides turn-key financing and project installation services to Bay Area municipal water utilities seeking to offer their customers easy access to water bill savings. In 2019, the program established a financing service partnership with ABAG, and contractual processes needed to launch the regional service. Designed to provide centralize financing and administration to participating water utilities, this program has influence in multiple markets, including renters and low-income households, and offers customers a simple and attractive path to install water-saving technologies with no up-front cost.

Portfolio Overview

Throughout 2019, BayREN continued to work towards aligning with state and local policies, expanding BayREN offerings for Bay Area communities and reaching BayREN’s stated vision as described and approved in the Business Plan:

The BayREN is a critical part of the solution for the state’s reliable and sustainable energy future that considers water, greenhouse gases, and resiliency. By uniting and coordinating multiple efforts at a regional level, and delivering these integrated solutions, the BayREN will help the State meet our aggressive goals related to climate change.

BayREN members reflected on the organization’s accomplishments and vision through an organization-wide process evaluation. The goal of BayREN’s 2019 deliberation was to: continue to advance towards BayREN’s stated vision within the Business Plan, ensure that

BayREN continues to meet the CPUC directives to the RENs, and more effectively deliver the suite of BayREN programs. BayREN members also worked collaboratively to better define BayREN’s value to the state. An overview of the results from this process is presented below. BayREN will continue to build on this work and weave it into the BayREN program offerings in 2020 and beyond.

Due to the COVID-19 crisis and anticipated economic downturn, a number of the goals and initiatives laid out for 2020 may be delayed or altered to accommodate future circumstances. In the short term, BayREN will use this pause in project implementation, particularly for physical improvements, to help our contractors and public sector partners build capacity through increased workforce education and training resources and increased coordination with CCAs and other local government agencies for future programs. Mid- and long-term goals will be assessed quarterly and updated as needed as BayREN better understands

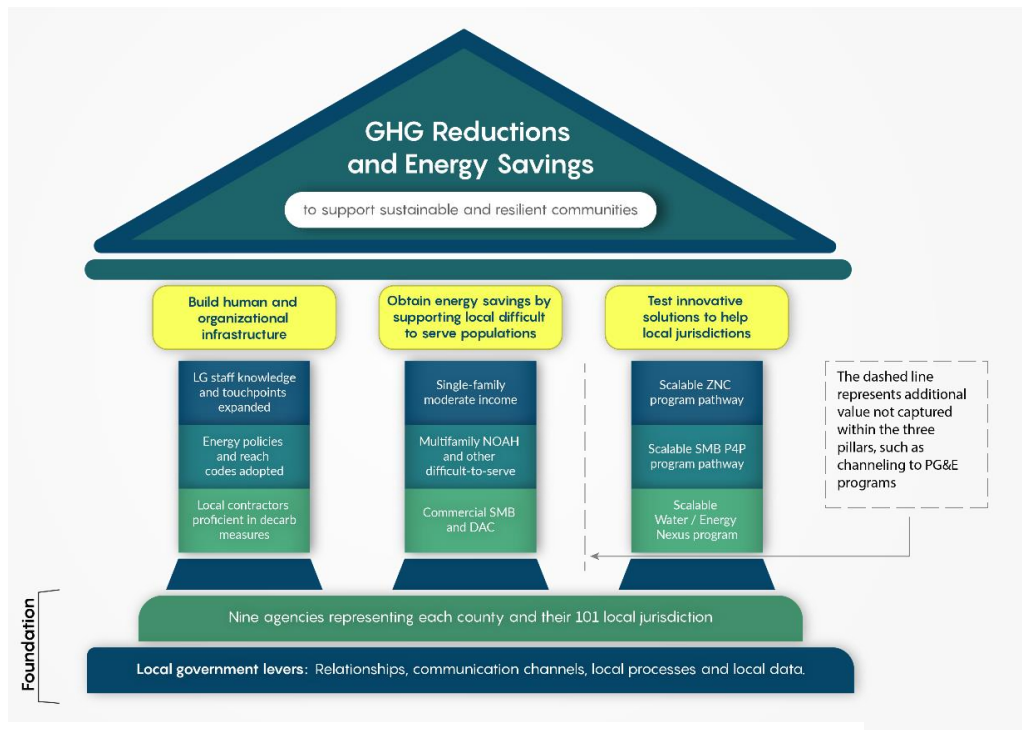


Figure 2: BayREN Value Pillars

the needs and potential for its programs.

Overview of the BayREN

As a regional energy network, BayREN helps to make state policy objectives practical by providing three overarching services (also referred to as BayREN’s value pillars):

1. Build human and organizational capacity for local jurisdictions to achieve greater energy savings;
2. Support local populations who have historically been underserved to achieve higher levels of energy savings; and
3. Test innovative solutions that have the potential to help local jurisdictions support efforts to increase energy savings and reduce greenhouse gas emissions.



Figure 3: BayREN Coordination

BayREN’s core strengths are the local network (and BayREN’s connection to counties and communities) and the regional system of governance, which is based on a holacracy model, and is used to directly engage local government members.

BayREN is organized around a representative agency from each of the nine counties (the BayREN members) all of whom have a common purpose – providing a sustainable energy future and helping their communities become more resilient. The organization is led by ABAG (the program administrator) and the representative of ABAG works directly with the other BayREN members.

BayREN serves 101 cities/towns and 9 counties, for a total of 110 jurisdictions. Within the BayREN member-to-local jurisdiction connections, some counties coordinate directly with sustainability coordinators or staff in each city through established channels, while others have more informal channels.

Each of the nine members also communicate to their local jurisdictions and local government agencies through existing interactions within a county. Through these existing channels, they can discuss and share information about BayREN programs. These connections allow for two-way communication, that is, the ability to share information between BayREN members (the counties) and the cities and towns that they represent. BayREN members can help local governments understand their offerings. BayREN members also are knowledgeable about local initiatives and local climate action and sustainability goals and the needs of the communities. In addition to sharing information, therefore, this network also enables BayREN to utilize the tools of the local governments. Local governments (both through the BayREN member representatives and through connections to the 110 local jurisdictions) offer unique relationships, communication channels, existing local programs and processes, and data that can be tapped into

by the members. These are referred to as “local government levers.” That is, resources that can be readily utilized in BayREN programs because of the BayREN model. BayREN is actively seeking to better serve their 110 jurisdictions.

Regional governance and program implementation models.

BayREN also has a unique governance structure built on holacracy. In 2016, BayREN chose to move to holacracy to enable clear roles and formal processes of communication and decision making. In holacracy, power is distributed throughout the organization, giving individuals and teams more freedom to self-manage, while staying aligned to the organization’s purpose. As shown in the figure below, unlike in a traditional structure, authority is spread across the member organizations. As such, holacracy ensures that the members (i.e., local government representatives) are directly involved in administering BayREN’s energy efficiency programs and share in the program direction, the

program design, and key program and organizational decision making.

Operationally, BayREN’s holacracy is made up of “circles” of people (also sometimes referred to as committees). BayREN as an organization has many different circles. These circles can form and disband as needed. BayREN has one large circle for the full set of member agencies (the Coordinating Circle) and one Program Circle (sub-circles of the Coordinating Circle) for each of the current programs (Single family, Multi-family, Commercial, Codes & Standards, Water Bill Savings, and Green Labeling).

This system of governance allows for clear decision making, adaptation to local needs, and engagement of local communities. It also allows for customization for both smaller and larger population areas (for example offering Codes & Standards forums, training, reach codes, or software depending on the city needs), while also facilitating coordination and information sharing between counties (and the local jurisdictions they represent).

Opportunities in 2020 and Beyond

In 2020, BayREN members will build on these strengths and the lessons learned from 2019 to continue to deliver services that are aligned with the BayREN value pillars and the needs of the State of California. Within each program, BayREN will revisit the theory, and develop program-specific metrics that speak to the core value that BayREN is delivering to both local governments and the State.



Figure 4: BayREN Holacracy

2019 Energy Efficiency Programs Overview



Single Family Home+ Program

BayREN began implementing the Home+ Program in January 2019 within the nine Bay Area counties. The Home+ Program takes a modular approach to customer engagement and allows for phased improvements while delivering technical assistance and guidance for sequencing improvements over time. This is accomplished through access to low and no-cost on-ramp services and measures, a flexible incentive structure, and Energy Advising services to support the customer journey and encourage participants to achieve deeper energy savings over the life of the Program.

Program savings are delivered through in-home no-cost energy evaluations and direct installation of energy saving devices, customer Do-it-Yourself (DIY) energy saving kits (EE Kit) and single and bundled measure rebates up to \$5,000 for building shell (sealing and insulation), Heating Ventilation and Air Conditioning (HVAC) and water heater upgrades.

The Home+ program was designed to **address known residential market barriers in the nine Bay Area counties such as lack of education about energy and non-energy benefits and health benefits of energy efficiency upgrades**, high upfront costs associated with whole house improvements, the need to provide services to moderate income and underserved customers, and to otherwise fill important gaps in the market. It also leverages local government relationships, processes and data within local jurisdictions to promote the program through the support of local populations.

In order to receive a rebate, it is required that projects be completed by a Home+ Participating Contractor who has completed the necessary

2019 Single Family Goals

- Provide comprehensive customer engagement, contractor support, and consistent program design.
- Introduce no-cost or low-cost introductory efficiency services.
- Offer services that provide long-term support and education to help drive program participation and deeper energy savings.
- Implement a multi-tiered Marketing, Education, and Outreach campaign on both the regional and local level.
- Engage communities through homeowner workshops, presentations and tabling at community groups, door-to-door canvassing and local media buys/direct mail.
- Increase penetration of moderate income and hard to serve markets.
- Increase BayREN program awareness through various on-ramp activities.
- Increase kWh savings through direct install or EE Kit measures.

program trainings. Contractors (and their work) are thoroughly vetted to ensure the upgrades are performed to the highest standard and customers receive the most savings from the project.

BayREN recognizes that Participating Contractors are a critical partner for BayREN and therefore provides a dedicated Contractor Services team who assists with any programmatic questions (e.g., paperwork, eligibility), training needs, and guidance on business best practices. The Contractor Services team also provides personalized support and helps participating contractors market the program and program benefits to their customers.

In addition, BayREN’s Home+ Program also provides many “non-resource” benefits outlined in the following sections.

Multi-tiered Marketing, Education, and Outreach Campaign

The Home+ Program is supported by a Marketing, Education, and Outreach (ME&O) campaign that is implemented across the region through local efforts by the BayREN members agencies. The BayREN members have multiple interactions with both local customers and contractors, which have proven to be a successful outreach strategy for the program. The local member agencies are best connected with the customers in their jurisdictions and understand the unique needs of their communities. Further, local governments are viewed as trusted messengers.

The ME&O activities vary by county, but primarily include a mix of homeowner workshops, presentations to community groups, tabling at community events, local media buys, direct mail, and social and digital media campaigns. Each county organizes at least one homeowner

workshop where they also engage with their local Participating Contractors and are available to answer customers’ questions related to home upgrades. BayREN also works closely with the Statewide Energy Upgrade California® ME&O administrators and Community Choice Aggregators (CCAs) to coordinate marketing efforts, as appropriate.

No-Cost Online Energy Evaluation

BayREN provides a customer-facing portal with access to a no-cost, no-commitment online energy evaluation, and important first step in the energy efficiency journey. **In 2019 there were over 800 customers that completed this small but important step and who received energy saving and health recommendations based on their responses.** Energy Advisors actively followed up with the Home+ Online Evaluation customers to further their engagement in the program (depending on the customer’s needs) and to help identify future EE improvement opportunities.

Green House Calls

In 2019, BayREN partnered with Rising Sun

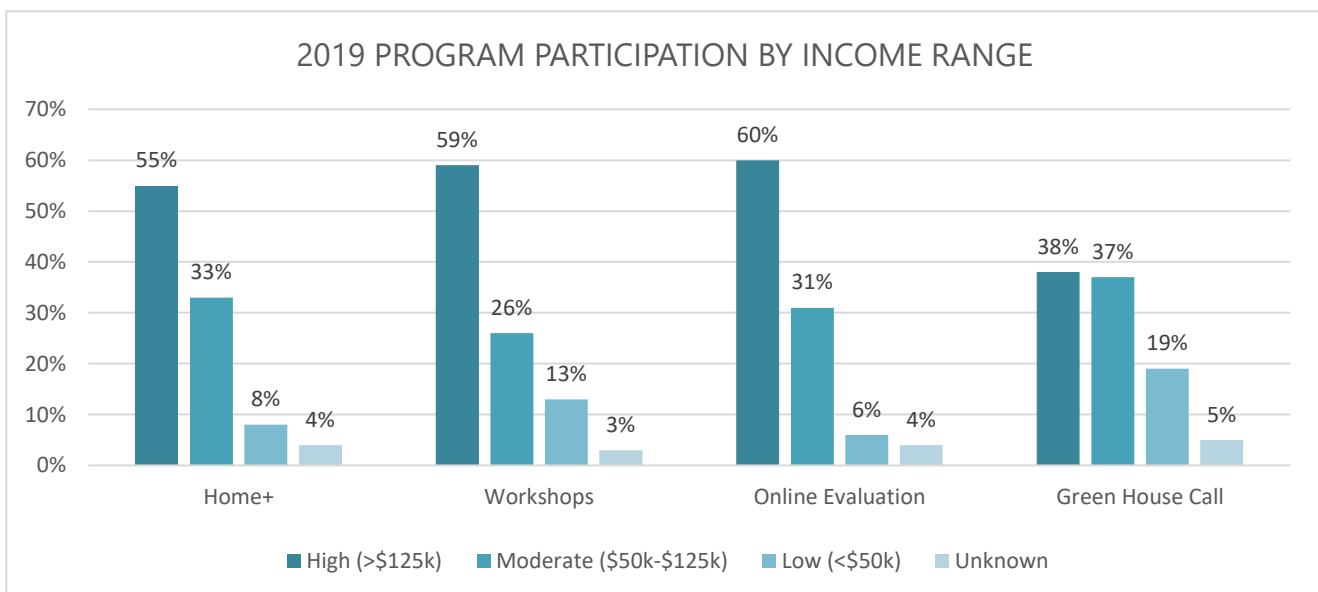


Figure 5: 2019 Home+ Participation by Customer Income

Center for Opportunity to better reach moderate income households. Through the no-cost Green House Call program, local youth were trained to conduct a basic energy assessment of the home and install LEDs, smart strips and simple water saving fixtures. Residents were also referred to the Energy Advisor for additional assistance and support in completing additional energy efficiency retrofits.

Kicker Measure Rebates

BayREN helps promote best practices associated with energy efficiency upgrades through kicker measure rebates. These ‘kickers’ are available for building air sealing, combining attic insulation and HVAC measures, combustion appliance safety (CAS) testing, and HVAC equipment downsizing. These added incentives not only encourage installation best practices, but also reduce the barrier-to-entry for customers interested in this program.

Energy Advisor Service

The Energy Advisor offers both consumer- and contractor-facing services for ongoing support and education to help drive program participation and deeper energy savings. Not all participants are interested in Home+; therefore, the Advisors take a consultative approach to identify additional programs and/or services that support the homeowner’s goals of becoming more efficient, including complementary program referrals to various energy and water efficiency programs in the Bay Area. Referrals are made to programs offered by PG&E, MCE, Energy Watch partnerships, CCAs and others.

Program Performance and Major Accomplishments

The program maintained consistent performance in 2019. Accomplishments include:

- Participants saved 415,099 kWh and 117,459 Therms.
- 1,931 single family homes were upgraded with direct install and energy efficiency kit measures such as faucet aerators, high efficiency showerheads, LEDs, and advanced power strips.
- 2,917 unique customers completed improvements with Home+ participating contractors.
- \$4,219,483 in incentives were paid to customers through the Home+ program.
- The average incentive per customer was \$1,447 with average savings of 131 kWh and 69 therms.
- 59% of customers who completed the Home+ online evaluation shared their PG&E data with BayREN.
- Roughly one third of customers served by Home+ services were moderate income customers (\$50k - \$125k combined income).
- Through the Home+ program, incentives were received by homes located in 209 unique zip codes. This translates to a 48% region-wide coverage for the program.
- A total of 81 contractors were enrolled as participating contractors into the program in 2019, along with 18 participating raters.

The Energy Advisor accomplishments include serving 1,109 customers in 2019:

- 1,352 complementary program referrals were made to 44 different programs.
- 52% of customers who enrolled in Energy Advisor services went forward with a project with the Advisor’s assistance. Since the Energy Advisor service launched in

2013, the lifetime conversion rate for enrolled Energy Advisor customers is roughly 55%.

- 968 participating contractor support cases were completed.
- 37 referrals were made from “Friends and Family”, bringing the total lifetime referrals from the group to 490.

Local ME&O activities organized within the BayREN territory include:

- 27 Homeowner workshops and 41 presentations to community groups and employers were organized by the BayREN county members to promote the Home+ program and participating contractors.
- 30 different tabling events were also organized by the county representatives, which led to over 15,000 impressions and 4,000 direct impressions.
- County members also carried out 26 direct mail campaigns promoting the Home+ program and other relevant events.
- The program website www.bayrenresidential.org, had 49,458 users, of which 94% were new users.

Opportunities in 2020 and Beyond

As described in BayREN’s Single Family Implementation Plan, BayREN has introduced activities that will highlight the health benefits of Home+ energy efficiency upgrades. Activities range from local county ME&O campaigns to an updated Home+ Online Evaluation containing home health questions, a new Healthy Home+ participating contractor designation and healthy home Energy Advisor support. The Healthy Home+ program is meant to effectively promote home health and weatherization improvements

that can reduce typical asthma triggers related to improved indoor air quality and whole building energy efficiency, including reducing mold, water intrusion, pests, dust, and other harmful particulates. Customers who provide information about their health to the program (whether through an online evaluation or in-home “Green-House Call”) will be contacted by an Energy Advisor who will further help educate the customer about the relationship between energy efficiency and home health and assist the customer with connecting with a Healthy Home+ participating contractor. BayREN will also be offering Healthy Home+ contractor trainings in 2020 furthering the goal to provide training and support for contractors, raters, and assessors to increase capabilities and quality of work, consistent with the BayREN Business Plan.

In order to better identify and understand the new 2019 Home+ program impacts, BayREN has requested meter data so that an analysis of 2019 projects can be conducted to gain insights into pre-project and post-project customer electricity and natural gas usage. This analysis will be used to gain insights into contractor performance, measure specific performance, EE kit and Green House call performance, regional distribution of savings, and more. Once complete, the analysis will be used to improve overall program performance.

BayREN is also pleased to introduce an electrification pathway in 2020 that will allow eligible customers to receive incentives for switching from gas fueled space heating, water heating, clothes dryer and cooking appliances to cleaner, highly efficient electric alternatives. This pathway fills an important gap in the provision of energy efficiency services and will drive adoption of new technologies that will help the State meet



our aggressive goals related to climate change. BayREN will also work with CPUC staff in order to introduce other electrification measures more prevalent in our territory (i.e. no existing AC) and that promote building science best practices (inverter-based mini-splits).

Green Labeling Program

The Green Labeling program has two primary offerings: Home Energy Score™ (HEScore) and continuing education and other opportunities for realtors, appraisers and lenders to increase their ability to understand, market and evaluate energy efficient and green homes. The primary objective of the program is to establish integrated and aligned green labeling to increase awareness and transparency of residential energy information, thereby supporting and increasing energy savings in the single family program.

Developed by the U.S Department of Energy (DOE), Home Energy Score is a national program. BayREN member StopWaste is a regional DOE partner for qualified Assessors in the San Francisco Bay Area. Assessors provide comprehensive home energy assessments using the Home Energy Scoring Tool that is quick and easy to use and does not require any testing or special equipment. Assessors can gather the information needed to assess a home in one short visit.

HEScore is a low-cost asset-rating initiative that engages contractors, home inspectors, and raters to offer Home Energy Scores. Training and mentoring for qualified Assessors, marketing and outreach campaigns, and the creation of a customized energy efficiency recommendations report that aligns with BayREN's Home+ are provided through this program. Along with the Score and a customized report, participants are also provided with associated energy and cost savings estimates, and referrals to energy efficiency programs, incentives, and financing tools.

HEScore also supports the implementation of local policy initiatives like the City of Berkeley's Energy Saving Ordinance (BESO). Commencing in

2019 Green Labeling Goals

- Establish integrated and aligned green labeling to increase awareness and information transparency, and to support and increase savings in the single family programs.
- Provide training and support to Assessors.
- Provide \$200 incentive for Scores done outside the City of Berkeley.
- Engage, educate, and motivate the Bay Area's real estate, rental, and financing professionals.
- Promote the use of green fields in the Bay Area's Multiple Listing Service (MLS).

2018 and continuing in 2019, **there has been a significant increase in both the number of Assessors trained on HEScore and in the number of scored homes.** In earlier program years, most HEScores were the result of the BESO ordinance; however, **now the majority of HEScores are occurring *outside* of Berkeley, showing that the program both provides a valuable service *and* is scalable.** Given the challenges of increasing energy efficiency in existing residential buildings due to costs, permit evasion, and emergency replacement of equipment upon burnout, the HEScore is an effective tool to increase savings. Specifically, the tool provides guidance to homeowners about the current performance of their homes, and how they can improve its efficiency together with available resources to make upgrades.

In 2019, BayREN continued to offer green real estate trainings and courses to professionals. Currently the Program provides five different types of training, as well as mentoring, that reaches nearly all parties to a real estate transaction,

including realtors, appraisers, and lenders. By providing trainings to these different professionals, BayREN is helping to realize more energy efficiency upgrades to homes at the time of sale. According to the Joint Center for Housing Studies, a homebuyer spends more than \$8,000 per year on home improvements in the first two years of buying a home.³ By providing the necessary training and support, real estate professionals can become adept at helping homeowners evaluate energy upgrade opportunities and promoting the health and comfort benefits of BayREN's programs. Mortgage lenders who offer energy efficient mortgages, and appraisers who are aware of the added value of energy efficient home features, also benefit from the BayREN trainings since they allow these professionals to better help the homeowner and buyer understand the financing options for purchasing a home with green features, the financial benefits of making future energy upgrades, or at a minimum, provide information regarding a home's energy usage, including on a monthly bill.

Program Performance and Major Accomplishments

- Successfully enrolled 19 Assessors, with 51 active Assessors.⁴
- 2,449 Scores were performed across all 9 counties, and only 258 of these were BESO Scores.
- Provided 2,082 rebates, totaling \$416,950 in incentives.
- Performed 67 on-site mentoring and in-

field quality assurance shadow sessions with 23 Assessors.

- Performed 78 remote quality assurance sessions with 14 Assessors.
- Coordinated with the Home+ Energy Advisor to provide support to homeowners who received a Score below 6.
- Provided four National Association of Realtors (NAR) Green Designation Trainings to 85 professionals.
- Led two Certified Green Real Estate Professional (CGREP) courses and certified 9 professionals.
- Provided one Certified Green Lender Professional (CGLP) Trainings to 3 professionals.
- Provided two Accredited Green Appraiser (AGA) Trainings to 40 professionals.

³ See Improving America's Housing 2015: Emerging Trends in the Remodeling Market by Joint Center for Housing Studies at Harvard University.

⁴ The number of active Assessors fluctuates throughout the program year. Assessors must Score a home every 180 days to stay active, per DOE requirements.

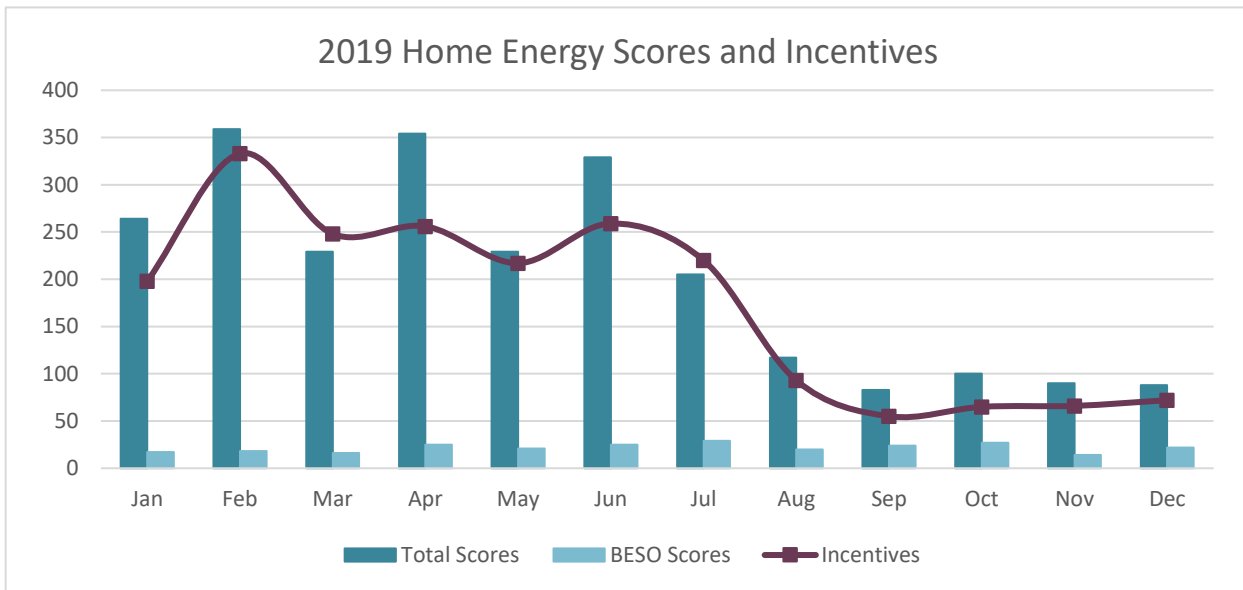


Figure 6: Home Energy Scores and Incentives

Opportunities in 2020 and Beyond

In addition to continuing to offer the HEScore rebate, marketing, Assessor support and the real estate professional trainings, three new opportunities will be available in 2020 that align with the program goals.

First, BayREN will offer an additional “kicker” rebate if a score is done both pre- and post-improvement. This will result in a multitude of benefits including accurate tracking of when upgrades are made; ensuring that the HEScores recorded are the most accurate and not out of date; and better ensuring that the score is done at a critical intervention point, i.e. before the retrofit. These changes were determined based on a careful analysis of past program participants.

A second opportunity in 2020 is the inclusion of electrification recommendations into the HEScore. To continue to align with the Home+ Program and help to advance the State’s decarbonization goals, assessors will be able to make recommendations for water and space heating electrification. While the HEScore does not include stoves and dryers,

Assessors will still be able to make recommendations for induction stoves and heat pump dryers, in alignment with new Home+ rebates. BayREN staff will help support Assessors in the transition to electrification recommendations.

Lastly, to make a stronger connection between the HEScore and real estate trainings, BayREN will launch a home inspector pilot in summer 2020. After completion of a NAR Green Designation training, BayREN staff will work with those realtors to both get their personal homes scored and enroll home inspectors they work with in a HEScore Assessor bootcamp. After the bootcamp, an additional rebate and assistance will be available to home inspectors to help them stay active and engaged in the program. This new program activity will help diversify the pool of Assessors by adding more home inspectors and focus on an important, but difficult to access trigger point: information to a new homebuyer or seller.

Multifamily Building Enhancement Program

BayREN offers the Bay Area Multifamily Building Enhancements Program (BAMBE) throughout the nine-county Bay Area. BAMBE fills an existing program gap by providing a streamlined participation path for multiple upgrades in multifamily buildings. Participant building types represent the diverse Bay Area multifamily market with respect to size, age, location, affordability, and ownership types. The program design allows for deeper and more customized savings than direct install programs but does not require the up-front cost of an energy assessment associated with a whole-building performance program. The design, along with the trust that comes with partnering with local governments for marketing and outreach, allows the program to reach and deliver services to populations that have traditionally been underserved by energy efficiency programs. After more than 5 years of operation, the program continues to tap into previously elusive savings potential. The streamlined and customized technical assistance model and multiple-measure incentive motivates property owners to take a holistic approach to energy efficiency planning.

BayREN continues to refine BAMBE to encourage greater energy savings while continuing to appeal to a broad spectrum of multifamily property owners and operators. The program's flexibility, scale, and relationships with multiple stakeholder groups allows for rapid design and deployment of pilots, which inform the program's evolution and response to changing sector and local government needs.

The Program is phasing out the MF Capital Advance Program in 2020, due to stagnant participation over the last two years. BayREN plans

2019 Multifamily Goals

- Incentivize 5,000 dwelling-units.
- Provide technical assistance to develop a customized scope of work and encourage property owners to install whole house measures that go beyond the status quo.
- Offer a simple, flat incentive of \$750 per unit when saving 15% or more of the whole building's energy usage.
- Provide referrals to other multifamily incentive programs in the Bay Area that are better suited.
- Organize and facilitate outreach events and meetings across the BayREN territory.

to release a report summarizing successes, best practices and lessons learned from administering the MF CAP for more than five years.

Program Performance and Major Accomplishments

BAMBE has maintained its popularity since inception in 2013. **To date, technical assistance has been provided to more than 112,000 units; 37,130 units, totaling 529 projects have been upgraded, and more than \$27 million in rebates have been paid to Bay Area property owners.** In 2019, the goals for completed projects and technical assistance were exceeded. The BAMBE design is an effective model for achieving multiple-measure upgrades in every segment of this hard-to-reach sector, and completed projects are representative of the diverse Bay Area housing stock. Major accomplishments in 2019 include:

- Technical assistance provided to more than 11,500 units.
- Incentives reserved for approximately 7,900 units.

- 71 projects, representing 5,730 units, completed upgrades receiving \$4,287,000 in incentives.
- \$73,350 in incentives were provided to PG&E Rater referral projects.
- Average project size was 81 units and average estimated energy savings per project was 15%.
- Average estimated energy savings for completed projects was 411 kWh and 33 Therms per unit.
- Over 380 units were referred to other multifamily programs in the Bay Area.
- Outreach efforts included 11 workshops and 4 industry events.
- 8 mailer campaigns were conducted throughout the region.
- 1 video case study was produced.

Opportunities in 2020 and Beyond

As detailed in the Business Plan, BayREN plans to continue BAMBE in the short- to mid-term until a substantial portion of the multifamily market has been reached. From the more than 520 properties that have participated in BAMBE and the stakeholder relationships developed over 6 years, the program has gained valuable insight into how to evolve and intensify the role that the multifamily market plays in helping California meet its energy efficiency and decarbonization goals.

As a result of a grant BayREN received from the Bay Area Air Quality Management District that allowed the program to offer supplemental incentives for high efficiency emerging heating technologies for projects located in disadvantaged communities, BAMBE was able to get a head start on working through the challenges of implementing electrification measures in multifamily buildings through the launching of a

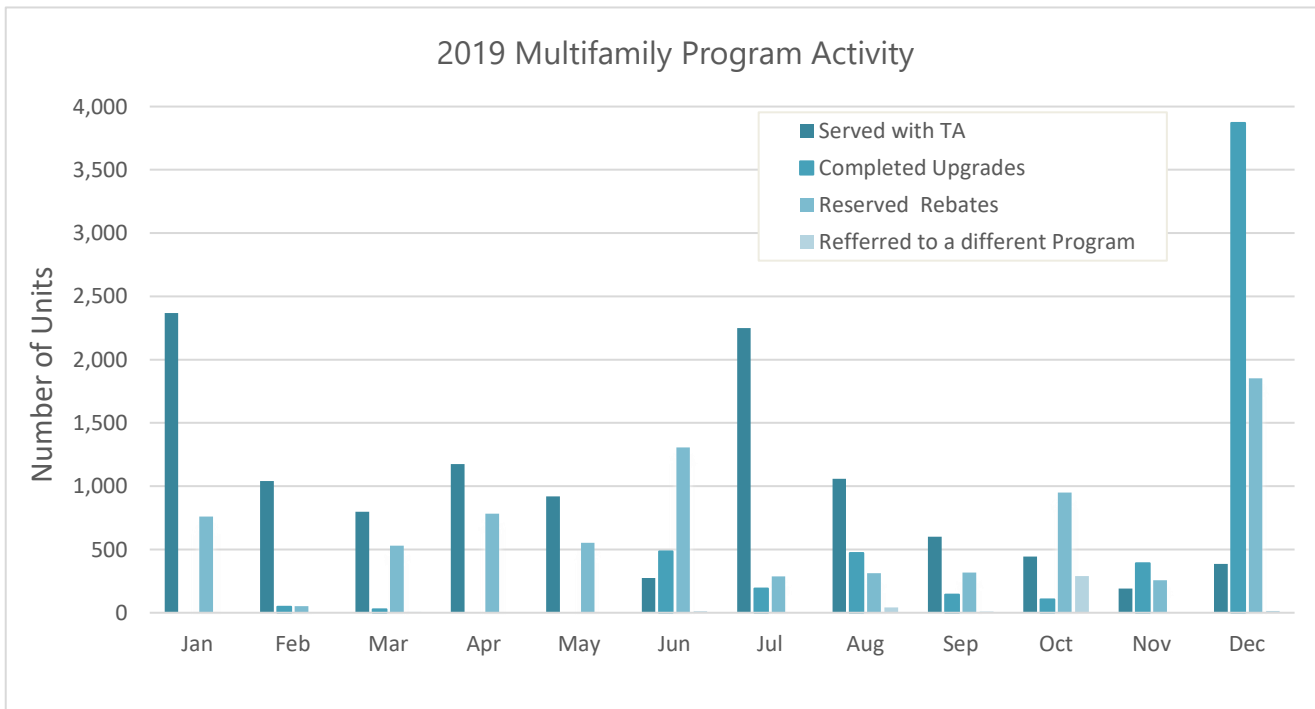


Figure 7: 2019 Multifamily Program Activity

pilot. In 2020, BAMBE is rolling out a decarbonization pathway that builds on the lessons learned from the 2019 pilot.

In 2020, BayREN is deepening its coordination with MCE to reduce confusion in the market and help ensure that property owners are getting the type of service and incentive level most appropriate for their business model, and thus expand the volume and quality of projects in our shared territory.

As BAMBE reaches substantial market share, the program will begin to reduce and sunset the rebates as currently structured. Rebates will be reserved for populations that have traditionally

been underserved with energy efficiency programs and for highly efficient emerging low carbon technologies. Incentives for traditional measures will eventually be replaced with other market drivers such as green labeling and local government policies in the mid-to-long term. Incentives and technical assistance will then be restructured to support these populations, measures, and mid- to long-term market drivers. The lead government agency implementer of the BayREN Multifamily program is currently implementing a grant from the California Energy Commission that explores market drivers and will establish recommendations on strengthening their impacts.

Small and Medium Business (SMB) Commercial

The BayREN SMB Commercial Program consists of two innovative and complementary activities: BayREN Business and BayREN Microloan. Combined these efforts make it easy for Bay Area businesses to undergo energy efficient (EE) upgrades. Overall, the BayREN SMB Commercial Program's goal is to increase the number of comprehensive EE upgrades, with an objective of completing over 500 retrofit projects in 2020 and 2021 and to issue over 90 microloans. Through 2025, the Program aims to provide incentives for upgrades to deliver combined annual energy savings of more than 12,000,000 kWh and 77,000 therms. Primary 2019 activities included orchestrating two competitive request for proposal solicitations, selecting the program partners, and negotiating contracts. These activities took longer than had been anticipated, resulting in a delayed program start to Q1 2020.

BayREN Business

The BayREN Business program is designed to empower business and building owners to take a holistic and longer-term approach to incorporating energy efficiency. Program participants receive turn-key services from the Program Ally (an energy service company). The services include a comprehensive energy audit followed up by a detailed energy savings proposal with multiple financing options. Upon project acceptance, the Program Ally manages every aspect of the installation and equipment procurement. Eligible businesses must have at least twelve months of prior energy usage history and meet the small to medium size criteria (under 50,000 sq ft and use less than 500,000 kWh or 250,000 therms annually). Businesses that are

ineligible will be referred to other third-party programs, or directed to the BayREN Microloan, which is available to help finance their EE upgrade.

When BayREN Business launches in 2020, it will become one of the first meter-based Pay-for-Performance (P4P) programs in the country to serve the SMB sector. BayREN Business chose to apply a population-based normalized metered energy consumption (NMEC) approach that measures the energy savings for each project by applying a virtual meter after completion, which are then rolled up into an annual portfolio of projects for incentive payments, evaluation, and reporting. Initial energy savings estimates are calculated through a hybrid approach, combining traditional program design, such as deemed and custom calculations, followed by a two-year period of metered based P4P. Fifty percent of the eligible rate payer incentives will be paid upon the project installation. The remaining fifty percent will be paid over two years, only after verifying measured energy savings data from utility meters. BayREN Business is led by the San Francisco Department of the Environment (SFE) who is responsible for contract management, reporting, and tracking progress to meet energy savings objectives. Through a competitive solicitation process, SFE selected Lime Energy to be the Program's Energy Services Contractor (ESCO). As program implementer, Lime Energy provides a complete turnkey service by completing free site assessments, presenting energy savings reports, overseeing every aspect of the installation and enrolling the project in the BayREN Business Pay-for-performance incentive program. TRC Engineers was selected as the Building Performance Advisor (BPA), overseeing QA/QC for the BayREN Business program by completing field inspections, desktop

reviews, and managing the incentive payments to Lime. TRC has also been tasked with providing technical assistance for verifying the program’s savings methodology and acting as the referral hub in cases where businesses aren’t eligible for BayREN Business. Recurve Analytics was selected to manage the Measurement and Verification (M&V) platform designed to measure energy savings for enrolled projects. Recurve also helps Lime predetermine customer eligibility, provides program reporting support, and completes data targeting analyses.

Microloan Program

BayREN has partnered with a San Francisco-based community lender, Mission Asset Fund (MAF), to launch a non-resource program that provides zero interest microloans (<\$2,500) to small and micro businesses for a range of energy efficiency projects, including lighting and refrigeration retrofits, and maintenance, repair and replacement of existing equipment types found at these sites. Founded in 2007, MAF’s mission is to provide small dollar loans to individuals and businesses in order to create positive credit history, improve their credit scores, and expand their financial knowledge and opportunities.

Through this partnership, the BayREN Microloan program will increase access to EE financing for hard-to-reach business customers, primarily microbusinesses located in DACs, while also seeking to improving their financial

security in the increasingly high cost Bay Area.

With this offering, engaged small businesses that are not a good fit for the BayREN Business program will be provided an alternative to assist them with undertaking an energy efficiency retrofit.

Program Performance and Major Accomplishments

- Successfully completed two (2) Request for Proposals Solicitations: one for Implementer and the other for Program Ally.
- Executed agreement between SF Environment and Mission Asset Fund for the Microloan subprogram.
- Engaged the nine BayREN counties to develop the Program’s marketing strategy and finalized the marketing collateral.
- Established and initialized programmatic systems, such as database set up, meter-measurement and verification, and incentive calculation systems for a smooth launch in 2020.
- Started the process to request smart meter data from PG&E and CCAs to automate the targeting and pre-qualification process.
- Reviewed and vetted the program’s energy savings calculator tools.
- Updated the Implementation Plan and Program Manual.

Codes and Standards

The mission of BayREN’s Codes and Standards Program is to provide support for Bay Area local governments to increase energy performance of buildings by improving energy code compliance, increasing adoption of local energy policies, and ensuring that local government needs, and concerns are considered when state policies are developed.

The Program aims to achieve its mission by:

- Reinforcing and expanding local government capacities and knowledge relative to energy.
- Working with local building department staff to increase their support for energy efficiency and to help them enforce the energy code.
- Encouraging consideration and adoption of local energy policies.
- Testing innovative services, tools, and policies to assist local governments with energy code compliance.
- Building relationships with state, regional, and local stakeholders, and representing local government concerns.
- Promoting regional consistency and best practices in adoption and implementation of local energy policies.

Program Performance and Major Accomplishments

In 2019, the Codes and Standards program continued and expanded its activities, offering trainings, electronic tools, municipal ZNE technical assistance, regional forums, and reach code support, as well as continuing to provide services to encourage energy code compliance and improvement during the recovery from the 2017

2019 Codes and Standards Goals

- Deliver 30 classroom training sessions, related to Title 24, Part 6 standards and develop new training modules at the request of local jurisdictions.
- Continue development and demonstration of electronic compliance enhancement and benchmarking tools.
- Offer ZNE/C-related design assistance for new and existing municipal projects to encourage adoption of ZNE/C policies.
- Support Bay Area local governments in the adoption and implementation of local energy ordinances.
- Improve communication between state agencies and local governments relative to energy regulations.

North Bay fires. Fifty-five jurisdictions in the Bay Area utilized one or more of the program offerings. In December, BayREN tabled at a CALBO Education Week event for the first time in order to reach additional local government staff.

The quarterly Regional Forums drew record numbers of attendees (**over 450!**), with attendance from **46 different local jurisdictions**. Three of our four Forums were co-sponsored with other agencies or organizations:

- **Energy Reach Codes:** Local Government Tools to Save Energy and Fight Climate Change (Co-sponsored with the Statewide Codes & Standards Team).
- Connecting **Public Health and Energy Efficiency** (Co-sponsored with the Bay Area Health Inequities Initiative (BARHII))
- Improving Energy Efficiency in Existing Residential Buildings.
- Preparing for the **Growth of Energy**

Storage—What Cities Need to Know (Co-sponsored by the Bay Area Air Quality Management District).

Efforts to support and encourage local adoption of reach codes continued and expanded to meet the Bay Area local governments' strong interest in reach codes. BayREN continued to participate in regional and statewide reach code working groups, to review and help craft model ordinances, and to provide policy support to local governments. BayREN staff provided a presentation on reach codes and the reach code process to a meeting of Bay Area Community Choice Aggregators early in the year in order to help them shape their involvement with reach codes, and also participated in a panel on reach codes at the Statewide Energy Efficiency Consortium Forum in June. The panel was well-received and was provided again in September in a webinar format. On a regional basis, BayREN hosted monthly reach code calls throughout 2019 that were open to all Bay Area jurisdictions, in addition to the March Forum on reach codes. These calls were attended by staff from 22 different jurisdictions throughout the Bay Area.

BayREN **delivered 30 classroom training sessions to 534 building professionals**, primarily local building department staff, across the region. We also began experimenting with contractor training by partnering with the City of Hayward to deliver a training event on water heaters, including heat pumps, to contractors working in that city. Towards the end of the year, we updated all our training curriculums to the 2019 Energy Code and developed new trainings on 2019 Code Changes for both Residential and Nonresidential projects.

The Codes and Standards Program continued to develop and demonstrate potential

opportunities for and benefits of electronic compliance enhancement tools (eTools). BayREN continued to offer our ePermit Tool, which provides information for homeowners and contractors on permitting and Energy Code requirements for water heater replacements and installations, new and replacement windows and skylights, and roof replacements. Growing from a pilot in Contra Costa County, the tool is now available for all jurisdictions in the Bay Area and can be accessed through BayREN's website. The expanded tool was launched with a webinar in March, and in the second half of 2019, the tool was utilized by jurisdictions in *seven* of the nine Bay Area counties. In addition, the CodeCycle platform continued to be used in three Bay Area jurisdictions. The tool assessed T24 commercial lighting compliance for 82 projects, representing more than one million square feet of building space, providing improved compliance with the complex requirements of this portion of the Code. BayREN assessed the tool's use in 2019, including developing recommendations for improving this offering, and started working with CodeCycle to begin implementing those recommendations. Both tools will be updated by January 1, 2020.

The Municipal Zero Net Energy (ZNE) Technical Assistance Subprogram was continued in 2019, providing ZNE-related engineering assistance for buildings in Burlingame, Portola Valley, and Newark, as well as conducting a portfolio assessment for San Mateo County. Opinion Dynamics and Tierra Resource Consultants completed a case study of this program element in August for the CPUC, which found that "the program has a successful track record and a

growing roster of satisfied program participants.”⁵

BayREN continued to support rebuilding efforts in Napa and Sonoma Counties following the 2017 North Bay fires. These efforts included providing information at the 2019 Rebuild Green Expo on ways homeowners could save energy by going above code requirements, providing informational materials to permit centers, and partnering with PG&E, MCE, and the Bay Area Air Quality Management District to support the Advanced Energy Rebuild Program in Napa.

Opportunities in 2020 and Beyond

Planned activities in 2020 include:

- Strengthening BayREN’s training activities, including implementing post-training follow-ups with attendees and improving data tracking.
- Continuing to encourage local energy policies through activities including hosting quarterly regional forums.
- Updating technical assistance subprogram for municipal Zero Net Energy building projects to include Zero Carbon projects when appropriate, and further encouraging adoption of related policies.
- Supporting local governments relative to adoption and implementation of reach

codes. BayREN has been developing a training curriculum for reach code implementation in conjunction with PCE/SVCE and will be providing customized training sessions. In addition, we are continuing work in Marin County to tracking reach code impacts, with the focus in 2020 on developing a less labor-intensive approach.

Expanding compliance improvement activities, including:

- Encouraging wider use of the ePermit Tool available in the Bay Area.
- Working closely with CodeCycle to make their eTool available to more local jurisdictions and integration with the local permitting processes.
- Experimenting with providing training for contractors, including through “lunch and learn” events at local building departments.
- Strengthening connections with local government staff, especially building department staff.

The Program is also planning to conduct a survey of local governments in the Bay Area to update and expand findings from our 2013 survey to inform our knowledge of local processes and constraints as well as future program offerings.

⁵ BayREN Municipal ZNE Technical Assistance Program; Group B, D33 ZNE Case Study 1; page 14.

Water Upgrades \$ave

In 2019, the BayREN program Water Upgrades \$ave⁶, laid the foundation for the regional program, which is based on the Pay-As-You-Save[®] offer:

Install water-saving technologies with no up-front cost — using a monthly water on-bill efficiency charge that is significantly lower than the estimated savings — so customers begin saving right away.

As envisioned in the BayREN Business Plan, Water Upgrades \$ave tests an innovative solution to help local jurisdictions achieve their water-energy nexus goals. To that end, the Program team pursued planning activities to centralize funding and administration of the regional on-bill program and make the offer available to municipal water utilities and their customers throughout the Bay Area. Concurrently, the Program team continued to provide technical assistance and program support to its three Pilot Utilities, upon whose experience the regional program is based.

The regional program will continue to offer the following assurances to Water Upgrades \$ave customers who voluntarily install eligible program improvements:

- No up-front payment, no new debt obligation, no credit checks, and no liens.
- A utility-approved monthly on-bill efficiency charge that is lower than estimated generated savings.
- Repayment required only while the customer resides at the project location.
- A guarantee that failed improvements are repaired or the payment obligation ends.

2019 Water Upgrades \$ave Goals

- Secure initial \$1 million fund for project financing in partnership with the Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission.
- Obtain ABAG Executive Board approval to execute Water Upgrades \$ave Master Agreements with Partner Utilities.
- Draft and obtain stakeholder review of the Master Agreement and nine Exhibits outlining the contractual roles/responsibilities for all Program partners in preparation for "approval to form" by the ABAG/BayREN legal team.
- Ensure all Program documents compliant with Senate Bill 564 - Water Bill Savings Act (2017) and applicable state codes.
- Initiate Customer Relationship Management platform design activities to provide automated and consistent flow of program information between Program Partners.
- Initiate a branding and market strategy process for customer and utility enrollment.
- Provide technical assistance and support for East Bay Municipal Utility District's Water Smart On-Bill Program, City of Hayward's Green Hayward PAYS[®] Program, and Town of Windsor's Windsor Efficient PAYS[®] Program.

Water Upgrades \$ave will provide Partner Utilities with access to capital at scale with the lowest possible interest rate and most flexible terms to lower project costs and ensure greater participation; a no upfront cost service that makes

⁶ Formally known as the BayREN Pay As You Save[®] (PAYS[®]) and BayREN Water Bill Savings Program.

it easy for customers of all income levels to install measures and lower their utility costs and local governments, residents, and businesses to pursue property improvements required by code changes, time-of-sale requirements, and increasingly stringent water-use regulations; and scalable, centralized administration that provides model fee schedule; program agreement oversight; program contractor recruitment and oversight; customer project oversight, Quality Control/Quality Assurance, and verification to start surcharge; marketing and customer enrollment; and customer repayment tracking.

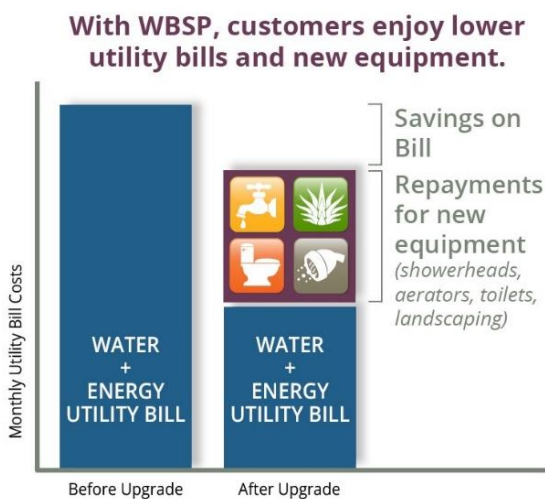


Figure 8: Water \$ave Concept

Program Performance and Major Accomplishments

Pilot Utilities in the Town of Windsor, City of Hayward, and East Bay Municipal Utility District (EBMUD) enable single family and multifamily water customers to install high efficiency indoor plumbing fixtures, convert lawns to drought tolerant landscapes, retrofit hot water heating systems, and repair and upgrade irrigation systems, while accruing total utility bill savings (i.e., water, sewer, electricity, and natural gas) that exceed the monthly on-bill efficiency charge.

Since 2012, the three Pilot Utilities have retrofitted 584 multifamily units and 247 single family homes. 2019 Program milestones include:

- Secured an initial \$1 million fund for project financing in partnership with the Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission.
- Obtained ABAG Executive Board approval to execute Water Upgrades \$ave Master Agreements with Partner Municipal Water Utilities.
- Drafted and engaged stakeholder review of the Master Agreement and nine Exhibits outlining the contractual roles/responsibilities for all Program partners in preparation for “approval to form” by the ABAG/BayREN legal team.
- Ensured all Program documents compliant with Senate Bill 564 — Water Bill Savings Act (2017) and applicable state codes.
- Initiated Customer Relationship Management platform design activities to provide automated and consistent flow of program information between Program Partners.
- Initiated a branding and market strategy process for customer and utility enrollment.
- Engaged existing Pilot Utility partners (Windsor, Hayward and EBMUD) and City of Sebastopol on preliminary.
- interest in joining as Partner Utilities for Water Upgrades \$ave.

Opportunities in 2021 and Beyond

In alignment with D.18-05-041 and BayREN’s commitment to obtaining energy savings by supporting local populations where it is otherwise

difficult to secure savings, Water Upgrades \$ave will reach market segments that are not well served by existing programs by making a no upfront cost offer that delivers assured utility bill savings; initiating a scalable centralized funding and administrative structure to decrease project costs and increase consistent program delivery; establishing ally relationships with local stakeholders; and achieving sufficient scale to attain self-sustaining status, covering funding and administration costs with project efficiency charges. Both property owners and tenants can participate in the Program, which is expanding its services to include single family, multifamily, and commercial customers.

Water Upgrades \$ave also helps strengthen human and organizational infrastructure in local jurisdictions by delivering a turnkey service that allows water utilities to participate with little impact on their financing or personnel resources.

Building on the success of its three pilots, Water Upgrades \$ave will scale an innovative solution for BayREN member governments and water utilities seeking to comply with the State’s mandate to “make water conservation a California way of life” and new state targets for indoor and outdoor conservation.

Evaluation, Measurement and Verification (EM&V)

In D.12-11-015, the RENs were authorized for the first time to conduct their own EM&V studies, and BayREN’s EM&V budget was approved in late 2017. BayREN completed the studies described below and looks forward to implementing the recommendations and study findings in 2020.

Program Performance and Major Accomplishments

The following studies began and/or concluded in 2019.

BayREN 2019 Process Evaluation

This study is described in detail in the section entitled “Portfolio Overview”, above.

BayREN 2019 Customer Segmentation Analysis

BayREN completed a customer segmentation analysis leveraging Experian and other data sets in order to identify 2019 participation trends and to inform marketing, education and outreach activities in 2020. The analysis looked at homeownership, home vintage, length of residence, household type, income levels, and customer mosaic by county. This helped inform discussions about future ME&O activities and allows county marketing leads to further refine their strategies and tactics. In addition, Home+ customer participation data was used to identify attributes of customers participating in the various Home+ program offerings (Home+, Workshops, Online Evaluation, and Green House Calls) and identify participation by mosaic category, income range, building age, and other attributes in order

to find trends in customer participation that could be used to analyze program success. Phase II of this analysis (to be completed in 2020) will include using the data to develop a propensity model that can be used to further inform targeted marketing activities based on those customers with a high likelihood to participate in the Home+ program.

Water Bill Savings Process Evaluation

In early 2019, BayREN released a final report of its process evaluation study of the three Water Bill Savings pilots: Windsor Efficiency PAYS®, Green Hayward PAYS®, and East Bay Municipal Utility District’s WaterSmart On-Bill Program. The goal of the study was to provide feedback on the existing programs to help inform the development of the regional program Water Upgrades \$ave. The 11-month study started in 2018 and drew on interviews with participating customers, water districts, and contractors as well as a review of all available program databases and materials. Completed in early 2019, the study concluded: “[T]here is a good foundation for a regional effort led by BayREN. BayREN has already established and standardized many of the processes across the water districts. As such, BayREN is a valued resource for participating water districts. Our overarching finding is that BayREN’s existing programs are paving the way for the future regional program.” The study also noted: “In addition to high levels of participant satisfaction, water districts and the current installation contractor are also highly satisfied.” The study’s assessment of opportunities and challenges

inherent in moving to a regional approach has already significantly helped to inform the regional program design and implementation.

As a follow on to this process evaluation, research was conducted with Utility and Contractor stakeholders that had not participated in BayREN's previous Water Bill Savings pilots. Grounded Research conducted the interviews to solicit feedback from these critical stakeholders regarding the interest and feasibility of the Water Upgrades \$ave draft program design. The findings from the study are currently being used to inform the final regional program design.

CodeCycle Demonstration Project Process Evaluation

BayREN conducted this study at the end of 2018 to obtain an objective analysis of how the CodeCycle Demonstration Project is currently functioning, the value of the project, barriers the project is experiencing, and how to improve it. The study involved in-depth interviews with current and prior users, discussions with BayREN and CodeCycle, and a review of relevant documents and reports. Based on the information collected, the study provided recommendations for moving forward with and improving the Demonstration Project, as well as potential topics for future research. Findings and recommendations included:

- Identification of four barriers to use of the tool: lack of building department time and resources; difficulty integrating the tool into existing processes; concerns about access for outside parties; and limited value of a lighting-only solution.
- Recommendations included:
 - Focusing on plan checkers within building departments who already have a process for electronic

submission of plans.

- Expanding the software to cover more than commercial lighting.
- Reconfiguring the software to work on all operating systems.
- Redesigning the process of integrating with building departments.

As a result of this evaluation, in 2019 BayREN worked with CodeCycle to address the identified barriers and recommendations, resulting in the implementation of several improvements. In 2020, CodeCycle expects to provide a revised version of the software which will work on all operating systems rather than only on Apple iOS. In addition, CodeCycle received an EPIC grant to expand the software to cover HVAC and envelope rather than only commercial lighting. These modules are being developed and may be available to Bay Area cities late in 2020. CodeCycle has also committed to exploring a couple of approaches to simplify integrating the tool into building department processes.

Multifamily Small Project Finance Product

Through the Bay Area Multifamily Capital Advance Program ("BAMCAP") BayREN has offered co-financing at zero-percent interest to Bay Area multifamily property owners since 2014. Through this pilot, BayREN has recruited 6 participating lenders, and lent more than \$2 million in program capital. However, projects with financeable amounts of less than \$100,000 do not justify the administrative costs borne by the participating lenders using this program model. A study was commenced in 2018 that characterizes the demand for small loans and makes recommendations on program design for a small loan product.

The study, completed in 2019, concluded that multifamily property owners / managers are conflicted about obtaining financing for their building improvement projects. While they often need external financing, receiving financing can be challenging. Interviewees indicated that while they typically get some form of financing, they sometimes have had to reduce their scope, delay their project, or make other project changes that they would have preferred not to make. If BayREN were to consider offering a loan product to facilitate projects with out-of-pocket costs of less than \$100,000, the study recommended consideration of the following program design characteristics:

- **Graduated terms.** Consider offering improved terms, such as lower interest rates and/or longer repayment terms, for projects that achieve deeper savings.
- **BAMBE alignment.** Make sure new financing products align with BAMBE requirements to streamline a potential loan process.
- **Non-debt financing structure.** Consider financing structures that an owner would not need to consider as debt. Some Energy Services Agreements (ESAs) are structured so that payments are expenses for the owner but are not classified as debt.

Energy Savings

In 2019, BayREN administered two resource programs within the Residential Sector that have reported energy savings: The Single Family Home+ and Multifamily Building Enhancement Programs. The SMB Commercial Program did not have any completed projects in 2019.

Single Family Home+

The original compliance filing goals filed in 2012 and April 2013 were based on Regional Energy Network (REN) work papers that were not approved by the Energy Division. Subsequently, BayREN utilized approved IOU and Statewide (SW) work papers, which produced lower goals and impacts. All Single Family Program cost-

effectiveness calculations in this report use approved SW/IOU work papers and/or deemed savings from the Database for Energy Efficiency Resources (DEER).

Multifamily Upgrade

Multifamily project energy savings are based on the EnergyPro Lite (EPL) version 4.0 tool developed in consultation with the Energy Division technical reviewer (Phase 1) for this program. The tool underwent major updates to accommodate revised time of use (TOU) and shifts in demand peak hours. Some measures such as lighting are modeled using IOU and SW work papers and/or custom calculators, which have been approved by the CPUC.

Table 1: Net Energy Savings

Electricity and Natural Gas Savings and Demand Reduction (Net)	Annual Energy Savings (kWh)	Lifecycle Energy Savings (kWh)	Annual Natural Gas Savings (Therms)	Lifecycle Natural Gas Savings (Therms)	Peak Demand Savings (kW)
Single Family	415,099	2,794,844	117,459	1,564,862	167
Multifamily	1,590,824	20,501,281	128,566	1,889,456	166
Small Commercial	0	0	0	0	0
Total Portfolio Savings	2,005,923	23,296,125	246,025	3,454,318	333
CPUC Goal Adopted ⁷	2,559,124	N/A	230,464	N/A	1,041
% of Goal	78%	N/A	107%	N/A	32%

⁷ BayREN's 2019 goals included savings for the small commercial P4P program but due to contracting delays and unforeseen ramp-up time, the program will launch in early 2020.

Environmental Impacts

Environmental impacts are shown in Table 2. These results are generated by the Commission-approved Cost Effectiveness Tool (CET). The CET is designed to calculate energy efficiency program

cost-effectiveness. Although emissions data are available through the CET, D.12-11-015 does not direct BayREN to track emissions.

Table 2. Environmental Impacts (tons of avoided emissions)⁸

Annual Results	Annual CO2 (tons)	Lifecycle CO2 (tons)	Annual NOx (tons)	Lifecycle NOx (tons)
Total Portfolio	1,526.98	23,169.59	1,081.10	17,601.21

⁸ Environmental Impacts are Net Annual and Lifecycle Tons of Avoided Emissions.

Expenditures

Table 3. 2019 Program Expenditures

Program Name	Filing Program Budget	Operating Program Budget	Percent of Portfolio Budget	Program Expenditures	Percent of Total Expenditures
Single Family	\$8,831,180	\$9,201,891	39.4%	\$8,869,557	44.1%
Green Labeling	\$1,013,500	\$1,042,484	4.5%	\$984,859	4.9%
Multifamily	\$7,576,300	\$8,087,798	34.7%	\$7,190,354	35.7%
Commercial	\$2,713,832	\$1,996,758	8.6%	\$704,446	3.5%
Codes and Standards	\$1,766,730	\$1,601,869	6.9%	\$1,316,049	6.5%
Water Upgrades \$ave	\$1,170,933	\$1,141,675	4.9%	\$903,295	4.5%
EM&V	\$264,372	\$264,372	1.1%	\$152,245	0.8%
Total Portfolio	\$23,336,847	\$23,336,847	100%	\$20,120,805	100%

Table 4. 2019 Program Expenditures by Category

Program Name	Program Expenditures	Admin Costs	Marketing Costs	DINI Costs	Incentives
Single Family	\$8,869,557	\$479,366.50	\$1,429,235.94	\$2,741,472.46	\$4,219,482.09
Green Labeling	\$984,859	\$11,907.37	\$66,844.80	\$485,657.04	\$420,450.00
Multifamily	\$7,190,354	\$325,234.44	\$139,064.11	\$2,355,205.17	\$4,370,850.27
Commercial	\$704,446	\$102,492.66	\$47,709.79	\$554,243.78	-
Codes and Standards	\$1,316,049	\$156,188.99	\$13,346.81	\$1,146,512.96	-
Water Upgrades \$ave	\$903,295	\$33,034.87	\$143,150.46	\$727,109.75	-
EM&V	\$152,245	-	-	-	-
Total Portfolio	\$20,120,805	\$1,108,224.84	\$1,839,351.91	\$8,010,201.17	\$9,010,782.37

Cost-Effectiveness

While the RENs are not subject to the same cost-effectiveness test that the IOUs are because of the limitations on the programs that can be offered, (i.e., implementing those programs that are the most difficult, both in design and implementation, programs that the IOUs do not want to offer for these reasons, and serving hard-to-reach markets), BayREN has an eye toward cost-effectiveness. The Commission has recognized that it is not realistic to expect REN programs to be cost-effective within the traditional IOU definition.⁹ With these restrictions, and far smaller portfolios, RENs do not have the advantage of using high savings programs (such as large commercial or

industrial) to balance residential and small commercial activities that typically and historically have low cost-effectiveness.

The Total Resource Cost Test (TRC) measures the net benefit of a program relative to the participant and administration costs. Total TRC costs in Table 5 are the sum of total administrative costs and incremental measure or participant costs. The Program Administrator Cost Test (PAC) measures net benefits relative to total program costs (including incentive and administration costs). Total PAC costs in Table 5 are the sum of total program administrative and incentive costs.

Table 5. 2019 Cost-Effectiveness

Program	TRC Ratio	PAC Ratio	Levelized Cost TRC	Levelized Cost PAC
Single Family	0.17	0.20	9,222.11	9,320.32
Multifamily	0.23	0.41	33.31	20.61
Small Commercial	NA	NA	NA	NA
Portfolio	0.17	0.23	9,255.41	9,340.93

⁹ CPUC D. 12-11-015, page 18.

Savings by End-Use

Table 6. 2019 Annual Net Savings

Program	2019 Annual Net Savings		
	Electric (kWh)	Demand (kW)	Gas (Therms)
Single Family	415,099	167	117,459
Multifamily	1,590,824	166	128,566
Commercial	0	0	0
Total Portfolio	2,005,923	333	246,025

Table 7. Annual Net Savings by End-Use

End-Use Category	kWh	% of Total	kW	% of Total	Therms	% of Total
Appliance or Plug Load	147,156.75	7%	29.90	9%	(3,549.70)	-1%
Building Envelope	23,134.91	1%	19.39	6%	10,904.18	4%
HVAC	166,154.71	8%	108.17	32%	107,327.68	44%
Lighting	64,380.53	3%	7.84	2%	(1,532.38)	-1%
Non-Savings Measure	-	0%	-	0%	-	0%
Service and Domestic Hot Water	14,272.33	1%	1.67	1%	4,308.80	2%
Whole Building	1,590,823.77	79%	166.05	50%	128,566.36	52%
Total Portfolio Savings	2,005,922.99	100%	333.02	100%	246,024.94	100%

D.18.05.041 Metrics

2019 BayREN metrics are provided in the Annual Report Excel Template, uploaded to EE stats. This section discusses some of the approaches and assumptions used to develop the metrics by sector.

Residential Sector

For the following residential metrics, BayREN used data provided by PG&E:

Multifamily:

- Percent of participation relative to eligible population (by unit).
- Average energy use intensity of multifamily units; kWh and Therms.
- Percent of benchmarked multifamily properties relative to the eligible population.
- Percent of benchmarking by properties defined as “hard-to-reach”.

Single Family:

- Percent of participation relative to eligible population.
- Average energy use intensity of single family homes.

Since PG&E does not have a process for collecting total number of eligible multifamily properties, BayREN used CoStar data to determine the eligible population by property. All other data are derived from BayREN’s internal tracking database(s) and outputs from the 2019 Annual Claims submission submitted on California Energy Data and Reporting System (CEDARS).

Commercial Sector

BayREN’s SMB Commercial Program was approved in May of 2018 and had significant

delays in 2019 due primarily to contracting. The Program will launch in early 2020. Thus, there are no metrics to report for 2019.

Codes and Standards Sector

Several metrics from D.18-05-041 are assigned to REN Codes and Standards Programs, and are reported below, along with additional metrics.

Reach Code Adoption

The Decision states that the number of local government reach codes implemented is a joint IOU and REN effort. As such, the IOUs will be reporting on adoption of reach codes throughout the state in their metrics filings, which includes BayREN’s numbers. We highlight the adoption of reach codes within the Bay Area during each building code cycle:

- Bay Area jurisdictions that adopted one or more reach codes during the 2016 code cycle: 11 (out of 20 statewide).
- Bay Area jurisdictions that adopted one or more reach codes for the 2019 code cycle: 13 (out of 17 statewide).

Participation in Forums

In addition to the approved metric of the number and percentage of jurisdictions with staff participating in an Energy Policy Forum, we also use the metric of the total number of attendees. In 2019, there were:

- Jurisdictions with staff participating in a Forum: 46 (42%).
- Total attendees at BayREN Forums: 483.

Jurisdictions Receiving Energy Policy Technical Assistance

This metric calls for the number and percent of

jurisdictions receiving energy policy technical assistance. BayREN offers this type of assistance through the compliance and policy support activities described above. (Note that this number does not include additional types of assistance such as answering questions and providing information to jurisdiction staff.)

- Jurisdictions in the Bay Area receiving energy policy technical assistance: 38 (35%).

Buildings Receiving Enhanced Compliance Support

Several BayREN Codes activities support code compliance for individual buildings.

- Buildings in the Bay Area receiving enhanced compliance support: 92.

Increase in Closed Permits

In 2018, BayREN conducted a literature review to summarize what is known about energy code related permit rates in California, both in terms of projects that open but do not close permits, and projects for which permits are never pulled. Key findings include:

- The literature contains limited data on actual permitting rates, with data unavailable for many types of projects such as re-roofing, fenestration, water heating, insulation, and lighting.
- Data on permit closure rates are even harder to find.
- Even for permitted projects, compliance with HERS and energy code documentation is lacking.

In addition, the Codes program staff also carried out a preliminary assessment of building

permit data in the Bay Area to determine the availability of this data and its usability. Two of the main findings were:

- Some, but not all, Bay Area jurisdictions have analyzable building permit data online.
- There is no standard way to find building permit data for projects that trigger the energy code, although it is possible to search the description field for key terms such as “water heater.”

We also concluded that we would need to develop a new subprogram, starting with a demonstration project, to begin to address this metric.

In 2019, we further explored how we might structure a project designed to address permit closure rates and concluded: 1) this would be very difficult to do in a measurable way, and 2) would not be an efficient way to achieve our mission of increasing building energy savings through improved code compliance and energy policies. BayREN and 3C-REN (the only other REN with a Codes and Standards Program), also began discussing this metric together and are considering options for addressing it.

Based on this work, together with further analysis of our REN metrics, BayREN and 3C-REN anticipate proposing changes to the REN metrics listed in D.18-05-041, including this metric, through the 2021 Annual Budget Advice Letter in September and in consultation with Commission staff. We are working together in 2020 to fine-tune our metrics so that they better align with the approved Business Plan activities and goals for both RENs.

Commitments¹⁰

Table 8. Commitments

Program	Committed Funds	Expected Energy Savings		
		kWh	kW	Therms
Single Family	\$ 288,008.32	-	-	-
Multifamily	\$ 170,013.60	-	-	-
Codes and Standards	\$ 178,346.77	-	-	-
EM&V	\$ 6,333.75	-	-	-
Total Portfolio	\$ 642,702.44	-	-	-

¹⁰ Committed funds are associated with the 2019 program year and are reserved or encumbered for future work permitted per the EE Policy Manual and EE Decision 15-10-025.

Appendix A: BayREN Programs for 2019¹¹

CEDARS ID	Program Name	Date Added	Date Removed
BayREN02	Multifamily Building Enhancements Program	1/1/2013	
BayREN03	Codes and Standards Program	1/1/2013	
BayREN04	Water Upgrades \$ave	1/1/2013	
BayREN05	Evaluation, Measurement & Verification (EM&V)	1/1/2017	
BayREN06	SMB Commercial Program	1/1/2019	
BayREN07	Green Labeling Program	1/1/2019	
BayREN08	Single Family Home + Program	1/1/2019	
BayREN01	Single Family Home Upgrade	1/1/2013	12/31/2018
BayREN04-1	Multifamily Capital Advance	1/1/2013	12/31/2018
BayREN04-2	Commercial PACE	1/1/2013	12/31/2018

¹¹ In 2019, BayREN updated program offerings to align with BayREN's Business Plan.