



Bay Area Regional Energy Network 2017 Energy Efficiency Annual Report



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Executive Summary

The San Francisco Bay Area Regional Energy Network (BayREN) is a collaboration of the nine counties that make up the Bay Area. Led by the Association of Bay Area Governments (ABAG), BayREN is a program administrator (PA) that implements effective energy saving programs on a regional level and draws on the expertise, experience, and proven track record of Bay Area local governments to develop and administer successful energy efficiency, climate, resource, and sustainability programs.

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 only two 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 12-11-015 in the formation and implementation of the RENs: filling gaps that the investor-owned utilities (IOUs) are not serving; developing programs for hard-to-reach markets; and piloting new approaches to programs that can potentially scale and offer innovative avenues to energy savings.

BayREN's services complement and supplement IOU programs, fills gaps, and finds synergies among approaches to maximize opportunities for customers and other market actors. For example, BayREN provides a regional solution that better connects to local communities and conditions than is typically possible from a large utility. In addition, the BayREN provides services across jurisdictions that municipal-only programs cannot achieve.

BayREN's governance is through the "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.

To date, BayREN programs have provided over **\$33 million in incentives to Bay Area property owners, and savings of 12 million kWh and 5 million therms.** BayREN has

Highlights & Achievements

In 2017, BayREN:

- Paid Bay Area Residents and Property Owners over \$7M in incentives, with savings over 2.7 GWh and 0.28 MM therms

Resource Programs exceeded 2017 goals:

- Provided Technical Assistance to property owners of over 16,000 multifamily housing units
- Upgraded over 5,000 multifamily units awarding \$3.9M in incentives
- Served over 7,500 single family customers and made over 10,000 program referrals
- Enabled over 2,000 Home Upgrade and Advanced Home Upgrade projects awarding \$3.4M in incentives

Non-Resource Programs achieved outstanding results:

- The Codes and Standards Program facilitated four "Regional Forums" with over 275 attendees; delivered 43 Title 24 training sessions with 495 attendees
- Provided over 695 Home Energy Scores and \$49,000 in rebates
- Commercial PACE assisted with successful closing of \$117K lighting retrofit in Petaluma, helped secure \$50K in rebates, and obtained multiple lender consents
- Water Bill Savings Program reserved Partner Utility funds for 1,283 multifamily units; current pipeline estimates a total program efficiency charge value of \$556,809 and rebate value of \$207,416

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 2017 as highlighted in this report. BayREN's offers services in the following four key program areas:

- **Single Family Home Upgrade.** BayREN is the exclusive implementer of Energy Upgrade California® Home Upgrade Program in the nine Bay Area counties. As part of this program, BayREN developed the Home Upgrade Advisor, a phone-based service that works with both contractors and home owners. **The Advisor service has resulted in more robust uptake in the Home Upgrade program and more leads to the Advanced Home Upgrade Program.** BayREN member agencies leverage their experience with residential programs to educate homeowners, recruit and train installation contractors, and enhance participation in Home Upgrade.
- **Multifamily Upgrade.** This model program offers no-cost technical assistance and a per-unit rebate for multiple measure energy upgrade scopes that save a minimum percentage of the whole building's energy usage. Unlike the IOU programs that focus on tenants, this program engages property owners over the long-term, helping them plan and undertake upgrades over extended periods.
- **Codes and Standards.** BayREN leverages its unique relationship with local governments to build local capacity, as well as to measure, monitor, and improve compliance with energy codes, and to develop energy efficiency policies and ordinances.
- **Financing:**
 - **Multifamily Capital Advance.** BayREN enables deep energy upgrades by offering no-interest capital for co-financing through multifamily lenders, lowering the cost of capital for property owners while maintaining a repaid pool of funds for future program cycles.
 - **Commercial PACE.** C-PACE provides channel outreach, education, and ongoing support services to enable contractors to fully integrate the compelling business case for C-PACE financing into their proposal and project development process. Moreover, the program provides **personalized advisory services to building owners** considering energy efficiency improvements, including coordination with PACE capital providers to drive comprehensive energy efficiency projects that building owners are unable to self-fund.
 - **The Water Bill Savings Program, formally known as Pay as You Save ® (PAYS®).** This program offering is an innovative water-energy nexus pilot to provide technical assistance and program design to Bay Area municipal water utilities seeking to offer on-water-bill financing to facilitate water utility customers' installation of water efficiency and energy efficiency improvements. This program has influence in multiple markets, including renters and low-income housing, and offers customers a simple and attractive path to install energy- and water-saving technologies with no up-front cost.

2017 Energy Efficiency Programs Overview

Single Family Home Upgrade Program

Program Description

BayREN is the exclusive implementer of the Home Upgrade Program within the nine Bay Area counties. Home Upgrade is a statewide, prescriptive incentive program that eliminates the need for energy modeling and reduces the number of homeowner interactions to demystify the whole house energy efficiency upgrade approach. Home Upgrade offers a balanced approach intended to produce a high volume of energy efficiency upgrades and energy savings while maintaining a reasonable level of technical rigor and quality assurance.

All projects must be performed by an Energy Upgrade California® Home Upgrade Participating Contractor. BayREN maintains a strong commitment to its Participating Contractors, the driving force of the program. Each Participating Contractor is assigned to a personal Account Manager, who is available to assist with any programmatic questions (e.g., paperwork, eligibility), training needs, and guidance on business best practices. Participating Contractors find the personalized assistance helpful and many are now incorporating home performance installations into their business models for the first time.

BayREN’s Home Upgrade Program provides many “non-resource” benefits including:

Multi-tiered Marketing, Education, and Outreach Campaign

Home Upgrade is supported by a Marketing, Education, and Outreach (ME&O) campaign implemented on both the regional and local level. As trusted messengers within our local communities, each BayREN member agency is responsible for local marketing activities. While tactics vary from county to county depending on the specific needs of the jurisdiction, they primarily include a mix of homeowner workshops, presentations to community groups, tabling at community events, door-to-door canvassing, and local media buys/direct mail. Counties also engage with their local Participating Contractors to include them in outreach

2017 Key Single Family Goals

- Provide comprehensive customer engagement, contractor support, and consistent program design
- Provide individualized and tailored contractor trainings and networking opportunities
- 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
- Offer a \$300 Assessment Incentive to encourage participation in the Advanced Home Upgrade Program
- Require proof of permit closure to align with SB1414 mandates
- Improve rebate and check processing turnaround times
- Increase the number of Home Energy Score (HEScore) assessors to support services
- Further integrate with Department of Energy (DOE) Home Energy Score to facilitating an additional Home Upgrade entry point

events. As an Energy Upgrade California program implementer, BayREN works closely with the Statewide ME&O administrator to coordinate marketing efforts.

Advanced Home Upgrade Assessment Incentive

In addition to implementing Home Upgrade, BayREN contributes significantly to PG&E's implementation of Advanced Home Upgrade in our shared service territory by providing a \$300 Assessment Incentive to help offset the cost to the homeowner of the requisite comprehensive energy assessment. This added incentive reduces the barrier-to-entry for customers interested in this program pathway.

Home Energy Score

The Regional Home Energy Score (HEScore) Program is a low-cost asset-rating program that engages contractors, home inspectors, and raters to offer Home Energy Scores in the Bay Area. HEScore provides training and mentoring for qualified Assessors, marketing and outreach campaigns, and the creation of a customized energy efficiency recommendations report that aligns with the Home Upgrade Program. Along with the Score and a customized report, the Single Family Program provides homeowners with associated energy and cost saving estimates, and referrals to home upgrade programs, incentives, and financing tools. HEScore also supports the implementation of local policy initiatives like the City of Berkeley's Energy Saving Ordinance and the City of Albany's HEScore pilot program. There was significant uptake in both the number of Assessors trained on HEScore and homes scored in 2017.

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. Although not all participants are interested in Home Upgrade, 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 such as those offered by PG&E, Marin Clean Energy, Energy Watch partnerships, and others.

Program Performance and Major Accomplishments

The program maintained consistent performance in 2017. Accomplishments include:

- Successful implementation of program changes to manage project volume and incentive budget.
- 1,585 Home Upgrade projects completed.
- 84 Participating Contractors who submitted at least one project, correlating to an estimated 63 jobs created¹.

¹ Simple Rule for Estimating Job-Years Created by Government Spending: \$92,000 of government spending creates 1 job-year: <https://obamawhitehouse.archives.gov/administration/eop/cea/Estimate-of-Job-Creation/>

- Average estimated energy savings per Home Upgrade of 414 kWh and 110 therms.
- A total of \$3,410,640 in incentives paid by BayREN for 1,585 Home Upgrades and 458 Advanced Home Upgrade Assessments. On average, Home Upgrade projects cost \$17,668 and received \$2,332 in incentives.

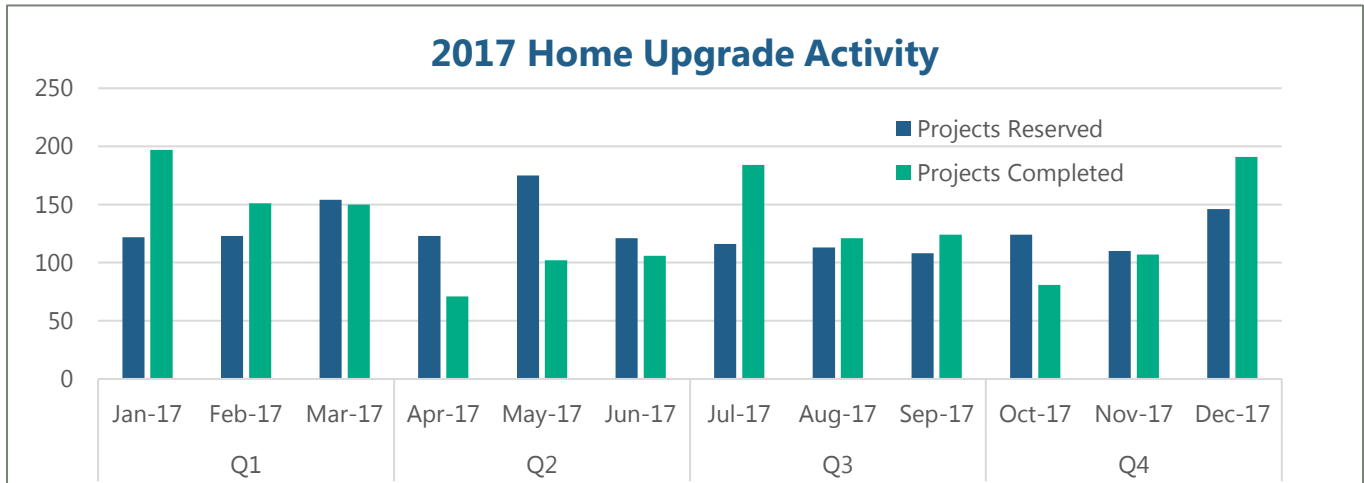


Figure 1. Home Upgrade Project Pipeline and Activity

- Energy Advisor impacts include:
 - 7,892 customers served and 10,323 referrals to other energy efficiency, water, and complementary programs.
 - HUA tracked 184 completed projects with a 57% program conversion rate. Illustrating the benefit of long-term engagement, 3 of these completed projects were done by homeowners who originally engaged with a HUA in 2013 (2%), 9 in 2014 (5%), 17 in 2015 (9%), and 79 in 2016 (43%).
 - Homeowners who worked with an Energy Advisor and completed Home Upgrade and Advanced Home Upgrade projects realized on average 18% greater energy savings compared to projects completed without a HUA.
 - Referrals from friends or family members totaled 154 in 2017, bringing the program-to-date total referrals from friends or family members to 387.
- Technical, business, sales trainings, and networking events for Participating Contractors, include:
 - Industry updates, technical and sales training opportunities, and workforce development announcements in 12 contractor newsletters with over 300 BayREN contractor, representatives subscribed, resulting in 3,920 contractor newsletter impressions in 2017.
 - Technical, program, and processing support for 848 Participating Contractor support cases resulting in 2,100 contractor interactions in 2017. Since program launch in 2013, BayREN has logged 2,300+ support cases resulting in 7,000+ contractor interactions.

- Full-suite BPI Building Analyst training (13 participants).
- Energy industry networking events (33 participants).
- Local marketing activities organized and facilitated across BayREN territory, include:
 - 26 homeowner workshops and 21 presentations with a combined attendance of 2,031.
 - 53 tabling events and 24 canvassing days (door-to-door outreach) with a combined engagement of over 6,000 residents.
 - 63,909 targeted homeowners reached through direct mail.
 - 497 real estate professionals engaged through 16 local events.
 - 43 local government and community based organization partnerships leveraged for outreach.
- The program website (www.bayareaenergyupgrade.org) received over 29,156 web hits with an average of nearly 2 minutes spent on the site.

HEScore Program accomplishments include:

- Successfully enrolled 25 Assessors, increasing the number of qualified Assessors to 53.
- Scored 695 homes throughout eight Bay Area counties.
- Issued 267 rebates, totaling \$49,500.
- Performed 50 Assessments with a qualified HEScore Mentor onsite.
- Organized and held 4 two-day HEScore Boot Camps for raters, contractors, and home inspectors to become qualified Assessors.
- Developed an Assessment Tracking Database that generates a custom recommendations report with the home's estimated annual energy costs and carbon footprint.
- Coordinated with the Home Upgrade Advisor to provide support to homeowners who received a Score.
- Provided Assessor and Score support to the City of Albany for their HEScore Pilot.

Opportunities in 2018 and Beyond

To improve program outcomes and increase participation of single family residents, property owners, and contractors in BayREN residential program, while also addressing hard-to-reach markets and gaps in program delivery, BayREN will introduce the following changes and improvements for 2018:

- Deploy a Smart Communicating Thermostat measure kicker for Home Upgrade projects to achieve greater savings and customer satisfaction by addressing occupant behavior at the same time as envelope and HVAC upgrades, as recommended in the 2015 Home Upgrade Impact Evaluation.
- Deploy a Participating Contractor Calendar for contractors, raters, and assessors to remove barriers to identifying training opportunities and support workforce development.
- Further Energy Advisor support for Bay Area customers unable to assume the high costs of the Home Upgrade Program to improve customer satisfaction, drive complementary program participation, and to

help homeowners identify affordable improvements that meet their needs.

- Test various energy data management tools to overcome barriers related to accessing customer meter data, customer targeting, analyzing contractor performance, and to improve behavioral savings and plug load management as recommended in the 2015 Home Upgrade Program Impact Evaluation.
- Align measure requirements with the latest version of the Home Upgrade work paper to address Title 24 updates, Energy Division Dispositions, and changes to measure costs.
- Introduce Home Upgrade data collection points to identify whether area or equipment was added to the home, addressing best practice recommendations from the 2015 Home Upgrade Program Impact Evaluation.

As described in BayREN's Energy Efficiency Business Plan², BayREN plans to transition out of the Home Upgrade Program while building on successful elements and experience from the past four years to introduce a more affordable program and incremental approach to whole house efficiency for moderate income homeowners and renters, leveraging the Home Upgrade Advisor to enable the customer journey. While enacting the improvements described above for the 2018 program year, BayREN will prepare to transition to a new single family program, following the CPUC's Business Plan approval. Preparations include continued market research and planning for a program that provides wrap-around services, support, and financing to drive program adoption and performance through properly aligned incentives, low-cost introductory efficiency services, and improved equitable access to services and upgrades.

² <https://www.caeec.org/business-plans-1>

Bay Area Multifamily Building Enhancement Program (BAMBE)

Program Description

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 “middle of the road” participation path for multifamily building owners. It achieves deeper and more customized savings than direct install or single measure programs, but does entail the up-front cost of the investment-grade energy assessment associated with a whole-building performance program. The overwhelmingly positive response from the multifamily sector shows that the program has succeeded in filling this gap and taps into previously elusive savings potential. Property owners report that the streamlined and customized technical assistance and multiple-measure incentive motivates them 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 wide range of the market. Participant building types represent the diverse Bay Area multifamily market with respect to size, age, location, affordability, and ownership types.

2017 Key Multifamily Goals

- Incentivize 5,000 dwelling-units worth of upgrades
- 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 on multiple measures saving 15% or more of the whole building’s energy usage
- Provide referral assistance to other multifamily incentive programs in the Bay Area that are better suited
- Organize and facilitate outreach events and meetings across BayREN territory

Program Performance and Major Accomplishments

BAMBE has maintained its popularity since inception in 2013, and has provided technical assistance to more than 76,500 units. Over 26,000 units have been upgraded, receiving more than \$19,500,000 in rebates for a total of 383 projects. In 2017, the goals for completed projects and the target for technical assistance was exceeded. The program demonstrates an effective model for achieving multiple-measure upgrades in every segment of this hard-to-reach sector. The portfolio of completed projects is as diverse as the housing stock. Major accomplishments for 2017 include:

- Technical assistance provided to more than 16,000 units.
- Approximately 7,350 units’ worth of incentives reserved:
 - 64 projects, representing 5,195 units, completed upgrades receiving \$3,896,250 in incentives.
 - Average project size was 81 units and average estimated energy savings per project was 16%.
 - Average estimated energy savings for completed project was 471 kWh and 30 Therms per unit.
- Over 2,998 units referred to other multifamily incentive programs in the Bay Area.
- Outreach efforts includes 7 Workshops and 3 Industry Events:

- 115 building owners or property managers attended a workshop.
- 47 attendees completed a program interest form.
- 11 mailer campaigns conducted throughout the region.
- Program participants recognized at 2 local government events.
- Coverage of the program in 3 issues of a publication (4 articles and 1 advertisement).

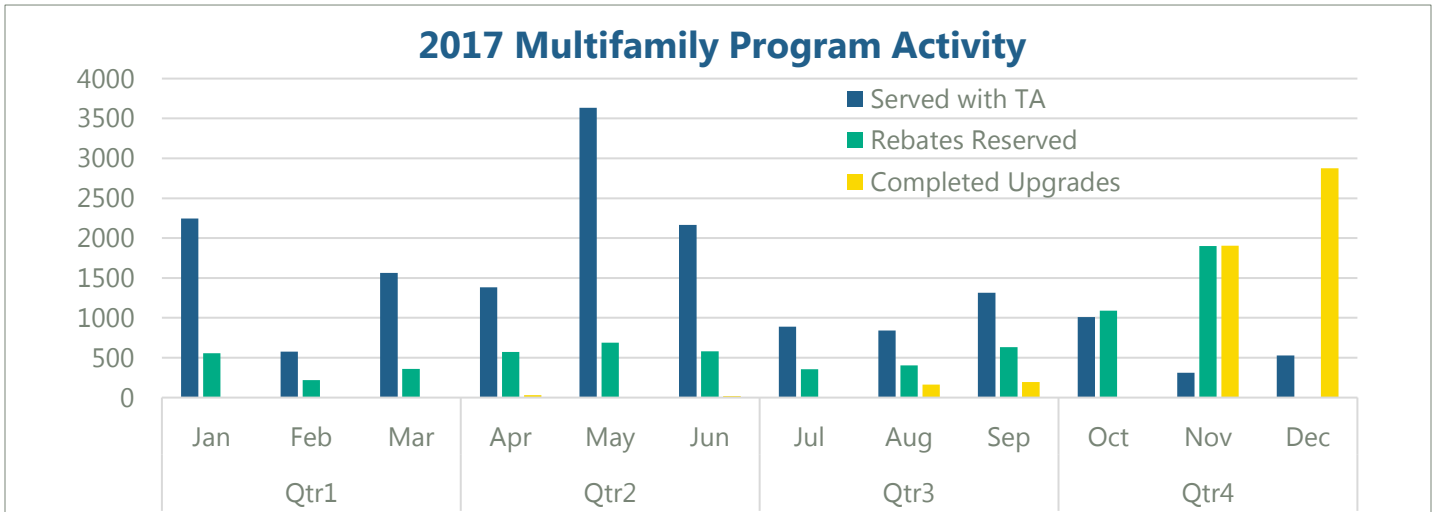


Figure 2. 2017 BAMBE Project Pipeline and Activity

Opportunities in 2018 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 380 properties that have participated in BAMBE, BayREN has gained valuable insight into how to evolve the program to target the deep energy savings required to meet California’s efficiency and climate goals. New and complementary strategies will be added to create long-term relationships with participants. As the current program reaches substantial market share, BayREN will begin to reduce and sunset the rebates as currently structured, replacing them in the mid- to long-term with other market drivers such as green labeling, local government policies, and financing. Incentives and technical assistance will then be restructured to support these mid- to long-term market drivers.

Multifamily Capital Advance Program

Program Description

The Multifamily Capital Advance Program (BAMCAP) advances up to 50% of the total loan principal related to the costs of approved energy efficiency measures, at 0% interest rate to participating lenders. This arrangement results in an effective interest rate that is as low as half of the lender’s interest rate, significantly reducing the cost of capital for the property owner. The program is designed to work within the larger multifamily program and minimize additional administration by leveraging the scope development and quality assurance provided

by BayREN multifamily subprogram or similar programs. BAMCAP leverages lenders' existing infrastructure and procedures, and utilizes an open market model to better serve the multifamily sector, which typically has limitations on supplemental loans and limited flexibility in the choice of lenders.

2017 Goals and Strategies

- Continue to close deals and expand the roster of participating lenders
- Assess the program's ability to serve the diverse range of multifamily properties and identify any remaining gaps

Program Performance and Major Accomplishments

- Participated in 4 loans totaling \$1,060,000 of BayREN capital
- Projects served include four non-profit affordable housing projects

Opportunities in 2018 and Beyond

In 2017, BayREN conducted an in-depth analysis of the types of projects best served by BAMCAP, and identified ways to fill remaining gaps. In 2018, BAMCAP will launch a Lender Referral Service to determine if energy efficiency financing products that exist in the market can meet the needs of property owners looking to finance amounts under \$100,000. The service aims to simplify the financing decision making process for property owners and reduce transaction costs for lenders by providing access to a pipeline of finance-ready energy efficiency projects.

Codes and Standards

Program Description

The Codes and Standards Program leverages the expertise and direct alliances among local governments to offer an integrated process that reflects needs specific to the Bay Area for:

- Enhancing the enforcement of energy, water, and green building codes.
- Establishing and institutionalizing measurement of code compliance.
- Sharing expertise and best practices on the development of reach codes and working to align policies and enforcement across jurisdictions.
- Preparing to implement future code updates.

Program Performance and Major Accomplishments

In 2017, the Codes and Standards Program delivered 43 classroom training sessions related to Title 24, Part 6 standards to 495 building professionals, primarily local building department staff, across the region. The program also closely collaborated with the City of San Jose to develop a new training session for building professionals on ZNE-related topics in relation to residential new construction.

The BayREN team continued to develop and demonstrate potential opportunities for and benefits of electronic compliance enhancement tools (eTools), including:

- The CodeCycle platform assessed T24 commercial lighting compliance for 78 projects, representing more than one million square feet of building space, providing improved compliance with the complex requirements of this portion of the Code.
- In close collaboration with Contra Costa County, the BayREN team updated the Energy Code Permit Guide eTool, which is designed to improve the user experience for homeowners, and developed a new fenestration module, (a hot water heater module was developed previously).

Throughout 2017, the Codes and Standards team collaborated with the California Energy Commission, Statewide IOU Reach Code Team, and the Bay Area Regional Collaborative (BARC) to support local adoption of ordinances that exceed statewide minimum requirements. As part of this collaboration, BayREN participated in regional and statewide reach code working groups, reviewed IOU-developed cost-effectiveness studies, provided policy support to local governments, and facilitated a “Regional Forum” on the topic of a mandatory solar photovoltaic ordinance.

2017 Key Codes and Standards Goals

- Deliver 30 classroom training sessions, including the newly developed session on ZNE Residential New Construction, with 300 attendees
- Continue to provide Permit Guides to local building departments and encourage additional jurisdictions to use the guides
- Expand work with Compliance Improvement eTools serving BayREN agencies
- Facilitate four “Regional Forums” with over 270 attendees
- Collaborate with the Statewide IOU Reach Code team and Bay Area local governments to support adoption of local energy ordinances
- Assist local jurisdictions in reviewing and commenting on proposed changes to Title 24 Part 6 Standards

Overall, the Codes and Standards Program facilitated four “Regional Forums” that drew approximately 279 attendees. Topics included:

- Household Electrification as a Pathway to On-site ZNE.
- Local Mandatory Solar Ordinance as a Pathway for New Residential ZNE Construction.
- Municipal Buildings Leading by Example.
- Matching Supply with Demand.

BayREN’s Municipal Zero Net Energy Technical Assistance Subprogram provided ZNE-related design assistance for 6 projects of various municipal building types, including recreation centers, animal shelters, youth centers, and emergency dispatch centers. Also in support of municipal building energy performance, the BayREN team improved the Energy Performance Targeting and Verification Calculator and developed Zero Energy Performance Index (zEPI) methodologies for additional municipal buildings types, including adult education centers, childcare centers, libraries, medical clinics, police/fire stations, and recreation centers. San Francisco updated its Green Building Requirements for city buildings in 2017 to require use of the zEPI tool.

Opportunities in 2018 and Beyond

As detailed in the Business Plan, the Codes & Standards Program will be further developed, based upon feedback from key program stakeholders and partners including Bay Area building professionals, building departments, chapters of the International Code Council (ICC), Bay Area planning and policy agencies, the Statewide IOU Codes & Standards Team, the California Energy Commission, and the California Building Officials Organization (CALBO). Near- and mid-term tactics are intended to enhance code compliance opportunities specific to local Bay Area governments. While new activities will be proposed, several existing services (like energy code compliance tools, specialized and focused trainings, and stakeholder engagement and policy development activities) will continue as cross-cutting, expanded supports more closely aligned with other BayREN programs.

Water Bill Savings Program (WBSP)

Program Description

BayREN Water Bill Savings Program (WBSP)³, provides Partner Municipal Water Utilities with model tariffs, on-bill program designs, and technical assistance to enable a means to collect repayment for costs related to the installation and service of water and energy efficiency improvements on a utility customer’s property.

Participating customers pay for these services through a monthly tariffed “efficiency charge”, which appears as a line item on their water utility bill and is based on their metered use.

WBSP helps local governments, residents, and businesses pursue property improvements required by code changes, time-of-sale requirements, and increasingly stringent water-use regulations. Participating customers who voluntarily purchase eligible program improvements are assured:

- No up-front payment, no new debt obligation, no credit checks, and no liens.
- A utility-approved monthly tariffed 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.

Work to date has allowed the Town of Windsor, the City of Hayward, and East Bay Municipal Utility District (EBMUD) to provide single family and multifamily water customers with services to install high efficiency indoor plumbing fixtures and lighting measures, convert lawns to drought tolerant landscapes, retrofit hot water heating systems, and repair and upgrade irrigation systems. These cost-effective on-bill improvements are intended to produce total utility bill savings that exceed the monthly tariffed efficiency charge. The different programs are:

2017 Water Bill Savings Goals

- Provide technical assistance and support for:
 - East Bay Municipal Utility District’s Water Smart On-Bill Program
 - City of Hayward’s Green Hayward PAYS®
 - Town of Windsor’s Windsor Efficient PAYS® Program
- Development of a regional model for program delivery, identification of potential implementation barriers for the regional model, and engagement with key local stakeholder groups
- Research and program design updates to effectively record notice of program participation with the Sonoma County Office of the Recorder
- Research and outreach to engage a more diverse contractor base to support Partner Utility Programs
- Increase marketing support for Partner Utility Programs



Figure 3. WBSP Concept Overview

³ Formally known as the BayREN Pay As You Save® (PAYS®) Program

- Town of Windsor – Windsor Efficiency PAYS®: Single Family and Multifamily residential field services since October 2012. Services include indoor plumbing fixtures and outdoor turf conversion to drought tolerate landscapes.
- City of Hayward – Green Hayward PAYS®: Multifamily residential indoor and landscaping services since August 2015. Services include indoor plumbing fixtures, common area energy measures, and weather based irrigation controllers.
- East Bay Municipal Utility District – EBMUD WaterSmart On-Bill Program: Multifamily residential indoor and single family/multifamily/commercial landscaping component approved for test projects, with field services available since July 2016.

Program Performance and Major Accomplishments

The WBSP three Partner Utilities have retrofitted 448 multifamily units and 247 single family homes for a total program efficiency charge value of \$602,589⁴ after utilizing approximately \$156,353 in rebates. The WBSP repayment history has been successful, with a default rate of less than 0.1%. Additionally, 16 single family accounts have successfully transferred their total efficiency charges to successor customers at the project locations. Major accomplishments for 2017 include:

- Ensured that the program design was aligned with SB-564 Joint Powers Authorities: Water Bill Savings Act⁵ signed by Governor Brown on October 2nd, 2017.
- Implemented the DocuSign platform to the Green Hayward PAYS® program to manage every stage of the program’s workflow from preparing and sending documents through signing.
- Installed water efficiency measures in 81 multifamily units for a total efficiency charge of \$16,846.
- Conducted marketing and outreach efforts, which helped secure two projects completed in January 2018 and reserve funds for over 1,283 multifamily units in the project pipeline, projecting a total program efficiency charge value of \$556,809 and a rebate value of \$207,416.
- Coordinated outreach with key partners and stakeholder groups including the BAMBE program, the East Bay Rental Housing Association (EBRHA) and Rental Housing Association of Southern Alameda County (RHASAC).
- Researched prevailing wage requirements for publicly funded residential water conservation and energy efficiency projects and performed analysis to inform cost-effectiveness of future on-bill program designs requiring prevailing wage. Conducted market surveys of Bay Area plumbing and landscaping contractors regarding their familiarity with prevailing wage and public works projects governed by Department of Industrial Relations (DIR) regulations.

⁴ The total Program efficiency charge includes funds reserved in 2017 for projects completed in January 2018.

⁵ https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB564

- Supported the development of the Assignment and Assumption Agreement for the Windsor Efficiency PAYS® Program, a mechanism to ensure successor customers are informed of and assume the responsibilities and obligations associated with the improvements installed at participating properties including requirements to pay the efficiency charge.
- Began preliminary discussions about low-cost financing options and how to effectively raise capital and fund services at Partner Utilities within a regional-scale program.

Opportunities in 2018 and Beyond

Contingent upon Business Plan approval, BayREN will:

- Expand the number of participating municipal utility partners to scale on-bill market and service delivery.
- Facilitate adoption of model tariffs and on-bill program design for market consistency.
- Provide technical assistance to support current Partner Utilities and refine program components to meet efficiency needs specific to target customer classes.
- Continue development of a regional program that would centralize funding and administration under a JPA or other governance structure.
- Engage more diverse contractors and enable qualified contractors and building professionals to deliver turnkey water and energy efficiency projects.

Commercial PACE

Program Description

The Commercial PACE (C-PACE) Financing Subprogram is designed to increase uptake in C-PACE financing available through a variety of Program Administrators (PAs) and Capital Providers (CPs) in the Bay Area. BayREN supports these goals by providing advanced contractor training, education, and project development support that is responsive to the priorities of the entire range of PACE “gatekeepers”: building owners, first mortgage lenders, capital providers/PACE administrators, and perhaps most importantly, contractors.

Building upon strong start-up activities, BayREN’s C-PACE program consultant Sustainable Real Estate Solutions (SRS) has delivered a recurring training and support program for Bay Area commercial contractors, focused on educating them on the funding mechanics and unique programmatic landscape of PACE programs in the Bay Area region (i.e., overlapping funders/program administrators in a competitive “open market” environment), and introducing them to SRS’ technical and financial underwriting systems and tools. In earlier program years, activities focused on delivering contractor trainings. In 2017, the program continued assisting in the development of projects in the pipeline and expanding engagement to important market actors who have traditionally not participated in energy efficiency (EE) programs: commercial HVAC contractors. Program efforts for these contractors, who are primarily called upon to replace failing equipment, now concentrate on marshalling existing EE resources (rebates, incentives, and technical assistance) to generate additional savings that turns the capital cost of the replacement project into an energy efficiency investment that achieves positive cash flow.

Program Performance and Major Accomplishments

In 2017, direct assistance to commercial contractors on multiple project opportunities continued, including project scenario development, attending owner meetings, validation of savings estimates, etc.

BayREN C-PACE Subprogram helped Moresco Distributing close a PACE bond through Sonoma County Energy Independence Program (SCEIP) to finance a comprehensive LED lighting retrofit at its main facility in Petaluma. Moresco is a leading supplier of packaging products serving food retailers and other similar customers throughout California and the Pacific Northwest. Project details are:

- \$167,992 total project cost.

2017 Commercial PACE Goals

- Continue to build upon prior year program activities
- Create a BayREN-branded Energy Efficiency Advisory (EEA) service that is highly versed in C-PACE, and can provide guidance on multiple financing solutions
- Introduce new tools and forms to streamline property qualification for C-PACE financing, reducing risks and uncertainties for contractors who are investing their valuable time and resources into the development process
- Continue offering targeted ongoing contractor training and education, but generally shift resources to one-on-one contractor assistance

- \$50,000 rebate.
- \$117,992 net project cost.
- \$125,632 total bonded cost (including capitalized interest).

BayREN worked with the contractor (SmartWatt) to illustrate project economics through the lenses of: a self-finance; on-bill finance (\$100k+17k out of pocket) and a 5-year EE loan. BayREN explained the benefits and logistics of C-PACE, contacted SCEIP to begin the application process, and managed the information and data exchange between the parties. SRS took the lead on securing lender consent (SCEIP does not assist with this), and submitted a data package for underwriting that met each of the existing lenders' needs (Wells Fargo, Bank of the West, and the SBA in Washington, D.C.).

This was the first C-PACE project to close. The project pipeline as of February 2018 is strong and includes:

- 10 projects in development valued at \$5 million, all with preliminary SIR >1⁶.
- 1 project for which SRS has solicited financing term sheets from a C-PACE capital provider, as well as lease-to-own.

Opportunities in 2018 and Beyond

- Continue Energy Efficiency Advisor (EEA) services and support for small and medium commercial HVAC contractors to illustrate how project economics on the single measure equipment replacement can be enhanced with additional EE measures and incentives.
- Work with contractors, Energy Watch (EW) programs, and PG&E to identify free analysis opportunities and rebates and incentives, and include deemed savings in project economics.
- Partner with Bay Area C-PACE capital providers and PG&E on-bill finance for outreach activities and explore streamlined offerings for smaller projects.
- Leverage future BayREN commercial programs and U.S. DOE-funded BayREN Integrated Commercial Retrofits (BRICR) tool to assist with customer targeting and interface, high-level energy modeling, and savings calculations to increase utilization of C-PACE.
- ABAG has assumed a leadership role in the region by entering into a Regional Collaborative Services Agreement (RCSA) with most of the PACE Administrators operating in the Bay Area. The RCSA is a consumer protection agreement that ensures some protections about PACE financing for local governments and their constituents. BayREN staff, who received complaints about misleading advertising used by some of the PACE contractors, have taken steps to prevent this from happening again.

⁶ Savings-to-Investment Ratio "SIR" > 1, where "S" = projected energy cost savings over ECMs effective useful life (EUL) & "I" = cost of equipment, installation and financing costs.

Evaluation, Measurement and Verification (EM&V)

Program Description

In D.12-11-015, the RENs were authorized for the first time to conduct their own EM&V studies. BayREN's EM&V budget was approved in late 2017.

Program Performance and Major Accomplishments

After completing a competitive procurement, the following studies began in 2017:

1. Single Family Moderate Income Market Characterization

This study supports a potential change to the single family program offering. Specifically, as proposed in the Business Plan, BayREN will transition out of implementing the Home Upgrade Program and create a new suite of programs targeted at moderate income homeowners and renters that will encourage whole house savings over time, engaging and leveraging existing Home Upgrade contractors as much as possible. The study's goal is to enable data-driven program design by providing characteristics of single family moderate income households (\$48,000-\$125,000) within the BayREN service territory. Study objectives include determining what this population wants as part of an energy efficiency and/or whole house program and to understand how BayREN members can best reach these customers. The report is scheduled to be completed by August 2018.

2. Small Medium Business (SMB) Non-Deemed Market Characterization Study

For the SMB market, BayREN began a study in 2017 to assess the general presence and relative size (preponderance of) certain energy consuming equipment and measure types that currently receive little-to-no ratepayer incentives and are considered capital intensive. Major objectives are to determine the relative market size and retrofit opportunity of these measures and equipment types, and associated costs and savings potential. The study will enable BayREN and other Program Administrators to evaluate the range of possible investment levels to get at these stranded savings, increase understanding of the specific market drivers that may be leveraged, and inform potential incentive and financing options, market needs, and possible outreach strategies. The final report is expected in June 2018.

Energy Savings

In 2017, BayREN administered two resource programs within the Residential Sector that have reported energy savings: The Single Family Home Upgrade and Multifamily Programs.

Single Family Home Upgrade

The original compliance filing goals filed in 2012 and April 2013 were based on Regional Energy Network (REN) work papers that were not approved in May 2013 by the Energy Division. Subsequently, BayREN utilized approved IOU work papers, which produced lower goals and impacts. All Single Family Program cost-effectiveness calculations in this filing use the approved IOU work paper for the Home Upgrade as the basis for energy savings.

Multifamily Upgrade

Multifamily project energy savings are based on the EnergyPro Lite (EPL) tool developed in consultation with the Energy Division technical reviewer (Phase 1) for this program. Custom measures such as lighting are modeled using IOUs' workpapers and custom calculators, as approved by the CPUC.

Table 1. Electricity and Natural Gas Savings and Demand Reduction

Electricity and Natural Gas Savings and Demand Reduction (Gross)	Annual Energy Savings (GWh)	Lifecycle Energy Savings (GWh)	Annual Natural Gas Savings (MMth)	Lifecycle Natural Gas Savings (MMth)	Peak Demand Savings (MW)
Single Family Savings	0.52	4.98	0.14	2.10	0.79
Multifamily Savings	2.20	27.88	0.14	2.00	0.80
Total Portfolio Savings	2.72	32.86	0.28	4.11	1.59
CPUC Goal Adopted ⁷	2.77	35.17	0.34	4.99	1.34
% of Goal	98	93	82	82	119

⁷ CPUC approved goals for the 2017 Annual Budget Advice Letter submission. Annual Budget Advice Letter submissions consists of a letter document and database submission uploaded to the Commission's California Energy Data and Reporting System (CEDARS).

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 2017	Annual CO2 (tons)	Lifecycle CO2 (tons)	Annual NOx (tons)	Lifecycle NOx (tons)	Annual PM10 (tons)	Lifecycle PM10 (tons)
Single Family	817	15,078	40	738	20	359
Multifamily	1,988	26,601	299	3,794	153	1,940
Total Portfolio	2,806	41,679	340	4,532	173	2,299

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

Expenditures

Table 3. 2017 Program Expenditures

Program Name	2017 Adopted Program Budget	2017 Operating Program Budget	2017 Program Expenditures	Expenditures as % of Portfolio Operating Budget	% of Total Portfolio Expenditures
Single Family	\$7,173,249	\$7,224,162	\$5,822,883	34.8%	38.9%
Multifamily	\$6,476,600	\$6,562,317	\$6,503,383	38.9%	43.4%
Codes and Standards	\$1,274,500	\$1,478,625	\$1,413,379	8.4%	9.4%
Financing	\$1,612,651	\$1,271,896	\$1,227,598	7.3%	8.2%
EM&V	\$189,486	\$189,486	\$14,297	0.1%	0.1%
Total Portfolio	\$16,726,486	\$16,726,486	\$14,981,540	89.5%	100%

Table 4. 2017 Program Expenditures by Cost Type

Program Name	2017 Program Expenditures	2017 Administrative Costs	2017 Marketing Costs	2017 Direct Implementation Costs	2017 Incentives Paid
Single Family	\$5,822,883	\$346,325	\$809,053	\$1,235,865	\$3,431,640
Multifamily	\$6,503,383	\$337,594	\$132,992	\$2,136,547	\$3,896,250
Codes and Standards	\$1,413,379	\$141,516	\$21,093	\$1,250,770	\$0
Financing	\$1,227,598	\$184,743	\$119,741	\$923,114	\$0
EM&V	\$14,297	\$0	\$0	\$14,297	\$0
Total Portfolio	\$14,981,540	\$1,010,177	\$1,082,880	\$5,560,593	\$7,327,890

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 towards 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 primary lighting or large commercial) 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 cost. 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. 2017 Cost-Effectiveness

PA	TRC Cost to Billpayers (TRC)	Total Savings to Billpayers (TRC)	Net Benefits to Billpayers (TRC)	TRC Ratio	Total Cost to Billpayers (PAC)	PAC Ratio	Levelized Cost TRC	Levelized Cost PAC
Single Family	\$9,615,109	\$2,116,127	(\$7,498,982)	0.22	\$5,663,265	0.37	1.37	1.01
Multifamily	\$10,808,920	\$7,097,366	(\$3,711,554)	0.66	\$6,224,811	1.14	0.56	0.32
Codes and Standards	\$1,413,379	\$0	(\$1,413,379)	0.00	\$1,413,379	0.00	0.00	0.00
Financing	\$1,227,598	\$0	(\$1,227,598)	0.00	\$1,227,598	0.00	0.00	0.00
EM&V	\$14,297	\$0	(\$14,297)	0.00	\$14,297	0.00	0.00	0.00
Portfolio Total	\$23,079,303	\$9,213,493	(\$13,865,809)	0.40	\$14,543,350	0.63	0.89	0.56

⁹ CPUC D. 12-11-015, page 18

Savings by End-Use

Only the Single Family Home Upgrade and BayREN Multifamily Programs contributed to 2017 installed energy savings.

Table 6. 2017 Annual Savings

Annual Results	2017 Annual Savings		
	Electric (GWh)	Demand (MW)	Gas (MMTh)
Single Family	0.52	0.79	0.14
Multifamily	2.20	0.80	0.14
Total Portfolio	2.72	1.59	0.28

Table 7. Annual Savings by End-Use

Use Category	GWH	% of Total	MW	% of Total	MMTh	% of Total
Commercial Refrigeration	0	0%	0	0%	0	0%
Codes & Standards	0	0%	0	0%	0	0%
Food Service	0	0%	0	0%	0	0%
HVAC	0	0%	0	0%	0	0%
Irrigation	0	0%	0	0%	0	0%
Lighting	0	0%	0	0%	0	0%
Non-Savings Measure	0	0%	0	0%	0	0%
Process Distribution	0	0%	0	0%	0	0%
Process Drying	0	0%	0	0%	0	0%
Process Heat	0	0%	0	0%	0	0%
Process Refrigeration	0	0%	0	0%	0	0%
Recreation	0	0%	0	0%	0	0%
Service	0	0%	0	0%	0	0%
Service and Domestic Hot Water	0	0%	0	0%	0	0%
Whole Building	2.72	100%	1.59	100%	0.28	100%

Commitments

Commitments provided in Table 8 were made in the past year with expected implementation by December 2018.

Table 8. Commitments

Program	Committed Funds ¹⁰	Expected Energy Savings		
		GWh	MW	MMth
Single Family	\$774,190	0.03	0.05	0.01
Multifamily	\$1,798,500	1.33	0.19	0.08
Total Portfolio	\$2,572,690	1.36	0.24	0.09

¹⁰ Committed Funds represent the incentive dollar amounts in the pipeline at the end of 2017 per program reporting databases.

Appendix A: BayREN Programs for 2017

CPUC ID	Program Name	Date Added	Date Removed
BayREN01	Single Family Home Upgrade	1/1/2013	N/A
BayREN02	Multifamily	1/1/2013	N/A
BayREN03	Codes and Standards	1/1/2013	N/A
BayREN04	Financing	1/1/2013	N/A
BayREN04-1	Multifamily Capital Advance	1/1/2013	N/A
BayREN04-2	Commercial PACE	1/1/2013	N/A
BayREN04-3	Water Bill Savings Program (WBSP)	1/1/2013	N/A
BayREN05	Evaluation, Measurement & Verification (EM&V)	1/1/2017	N/A