

BAYREN

Local Governments Empowering Our Communities



2020 Energy Efficiency Annual Report

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

Bay Area Metro Center, 375 Beale Street, Suite 700, San Francisco, California 94105-2066

(415) 820-7947 | www.BayREN.org | JBerg@bayareametro.gov

Contents

Executive Summary	3
Portfolio Overview	4
Residential Sector	5
Commercial Sector	5
Cross-Cutting Sector.....	6
BayREN 2020 Programs	7
Single Family Home+	8
Green Labeling.....	13
Bay Area Multifamily Building Enhancements (BAMBE).....	16
Small and Medium Business (SMB) Commercial.....	19
Codes & Standards	22
Water Upgrades \$ave.....	26
Evaluation, Measurement and Verification	30
Savings and Expenditures	31
Energy Savings.....	32
Savings by End-Use.....	32
Environmental Impacts	33
Expenditures	33
Cost-Effectiveness.....	34
Metrics	37
BayREN Value Metrics.....	37
D.18.05.041 Metrics.....	38
Appendix A: BayREN Programs for 2020.....	41

Executive Summary

2020 was a year of profound devastation to our state’s health, economy and environment due to the COVID-19 pandemic, wildfires and other natural disasters. BayREN, as a program administrator comprised of local government agencies, focused our activities on meeting the needs of our communities, stakeholders and partners and made program adjustments accordingly. As discussed in more detail in this report, BayREN’s response included expanded programs and support designed to support our contractors, homeowners, renters and small businesses. These changes proved to be successful, and we ended the year either meeting or exceeding the majority of our program goals.

As we enter our ninth year as a program administrator, we are proud to highlight some of our accomplishments which include providing **\$55.4 million in incentives, saving 4.6 million MMBtu of energy and avoiding 156 Million Tons of Carbon Emissions.**

BayREN achievements to date:

- 4.6 million MMBtu of energy saved
- 156 million tons of carbon avoided
- 53,115 housing units upgraded
- \$55.4 million in incentives awarded

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 our programs. BayREN has added electrification pathways in our residential programs and has some element of decarbonization throughout the entirety of the portfolio. Of significance, our collaborative efforts with the Community Choice Aggregators in our region have increased, resulting in the layering of incentives and other program elements.

BayREN’s residential resource programs served 4,509 single family households and 3,945 multifamily units, leading to 2,330,692 gross kWh and 153,753 gross therms saved with 383,840 gross kWh of those savings coming from fuel substitution measures and projects. The Green Labeling program provided single family homes with 1,626 Home Energy Scores and \$317,300 incentives. Additionally, the Green Labeling program held 12 real estate trainings and trained 203 real estate professionals. The Water Upgrades \$ave program prepared for regional implementation by finalizing the Master Agreement for enrolling Partner Utilities, obtaining an initial \$1M line of credit to pay for completed projects, and designing the finance service process. The Codes & Standards program provided 35 trainings and held four remote forums with 467 attendees. BayREN’s Commercial program prepared to launch while overcoming challenges due to COVID-19 such as finding a new implementer and navigating changing restrictions for small and medium businesses.

D.12-11-015 provided the criteria upon which REN programs are evaluated.¹ As a regional energy network, BayREN also helps to make state policy objectives (i.e., reducing GHG emissions and increasing

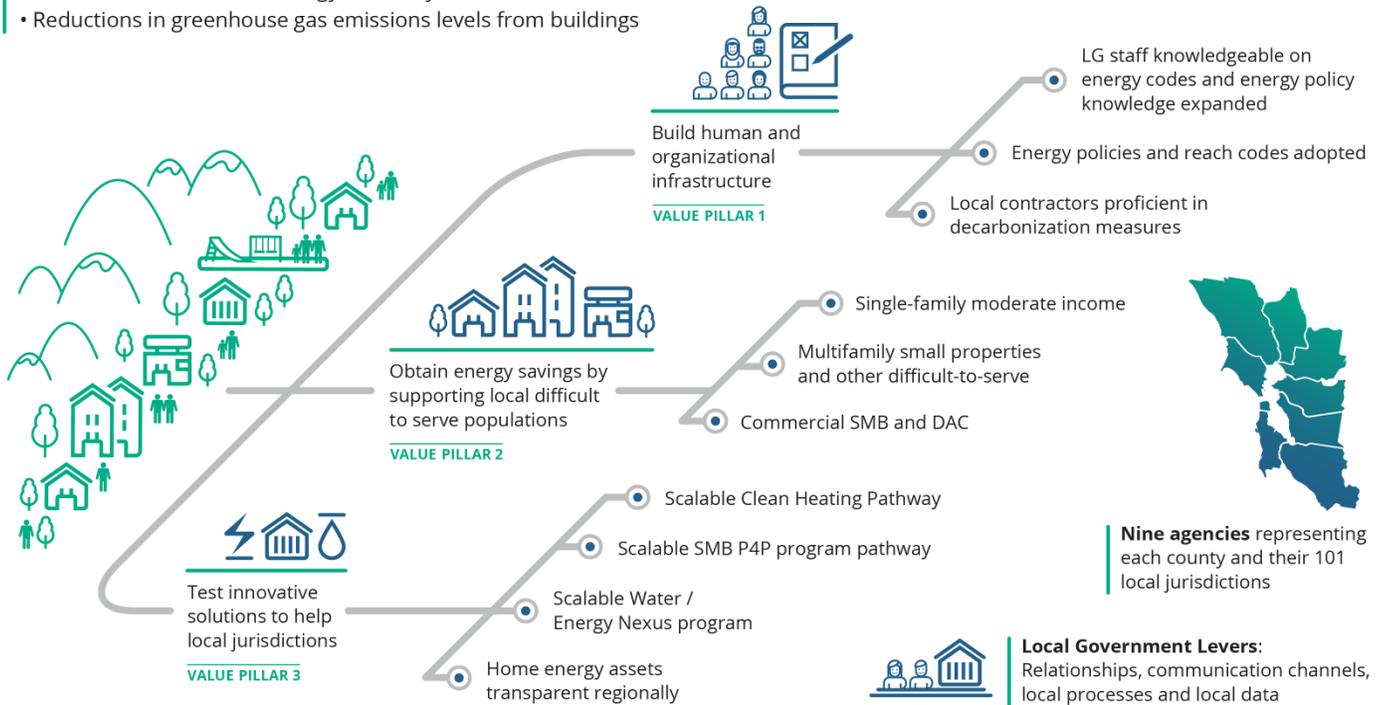
¹ The criteria are: 1. Activities that utilities cannot or do not intend to undertake; 2. Pilot activities where there is no current utility program offering, and where there is potential for scalability to a broader geographic reach, if successful; and 3. Pilot activities in hard to reach markets, whether or not there is a current utility program that may overlap. Note this criterion was reiterated in D.19-12-021, and expanded the utility programs to also include CCA programs.

energy savings) practical at the local level by conducting three overarching services, also referred to as BayREN’s value pillars as shown in Figure 1.

FIGURE 1: BAYREN VALUE PILLARS

State Policy Goals

- Doubling of energy efficiency savings in existing buildings
- Reduction of barriers to energy efficiency
- Reductions in greenhouse gas emissions levels from buildings



SMB = Small and Medium Business | P4P = Pay-for-Performance | DAC = Disadvantaged Communities

In 2020 as part of the Annual Budget Advice Letter, BayREN submitted value metrics and measurements within these three value pillars that demonstrate BayREN’s impacts helping reduce GHG emissions and increase energy savings. These metrics are focused measurements, intended to detail the value that BayREN provides to the State. 2021 will be the first year that BayREN reports on these metrics.

Portfolio Overview

BayREN is a vital part of the solution for California’s reliable and sustainable energy future that considers water, greenhouse gases, and resiliency. BayREN unites and coordinates multiple efforts at a regional level, and then deliver these integrated solutions to help the State meet our aggressive goals reduce climate change.

Residential Sector



Single Family Home+

Through the Single Family Home+ (Home+) program, BayREN provides a variety of service offerings to Bay Area single family homeowners and renters including rebates for qualifying measures, an online energy evaluation, no-cost energy efficiency kits, in-home education, and direct install services. A central part of this program is free energy advising from certified building performance professionals (Energy Advisors) that work hand in hand with customers through the entirety of their energy retrofit project. The Energy Advisors provide unbiased advice, education about the co-benefits of energy efficiency including health, support with contractor selection, and installation best practices. 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. Apart from rebates, the Energy Advisor service continues to be our customers' most valued BayREN offering.



Green Labeling

The Green Labeling program builds on BayREN's work in the single-family market by focusing on additional market actors and has two offerings: Regional Home Energy Score (HEScore) that trains Assessors to do a HEScore and provides incentives for scores; 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.



Bay Area Multifamily Building Enhancements (BAMBE)

BAMBE's successful program design to engage multifamily property owners who are sensitive to the barriers of participating in a rebate program and helps them plan and undertake upgrades. BAMBE 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 2020, to promote consistency across multifamily rebate programs in the Bay Area, Program staff 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 business (SMB) 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 BayREN Business program benefits include increased customer, contractor and building owners' knowledge and comfort, while also enabling long-term energy savings in this Pay-for-Performance (P4P) design. 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. By participating in the program, Bay Area SMBs can get multi-measure energy efficiency upgrades with no-money down, or with small dollar 0% interest financing through the BayREN Microloan Program.

Cross-Cutting Sector



Codes and Standards

BayREN's Codes and Standards program seeks to assist local governments with energy policies and energy code compliance by providing support for Bay Area local governments to increase energy performance of buildings by improving energy code compliance, increasing adoption of local energy policies. The program also serves as a bridge between local governments and the California Energy Commission to ensure that the voice of local governments is heard 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 2020, Water Upgrades \$ave developed regional program agreements and protocols, obtained capital funding, assembled an operations team, and initiated water utility outreach with the goal to begin delivery of customer services in early 2021. Designed to provide centralized 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.



BayREN 2020 Programs

Single Family Home+

The Home+ program contributes to the overall BayREN mission by reaching a local difficult-to-serve (LDTs) population, specifically moderate income single family households. Single family moderate income, defined as households that make between \$50,000 and \$125,000, are considered LDTs by BayREN. Additionally, households whose primary language spoken is not English are considered LDTs as previous outreach efforts have been primarily conducted in English. These households have been shown to be underserved in PG&E's past Home Upgrade programs and in statewide evaluations of residential programs.

The Home+ program is also contributing to the creation of an electrification pathway that attempts to ready the market for a full-scale regional decarbonization program. This pathway allows 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 aggressive climate related goals.

On behalf of BayREN, StopWaste (as the Alameda County BayREN member) obtained a Bay Area Air Quality Management District (BAAQMD) grant to develop and administer a project designed to increase the use of heat pump water heaters (HPWH) in the region. As part of this effort, staff coordinates with manufacturers of this technology on trainings for proper installation. In addition to rebates that are offered through the Home+ program for HPWHs, three Community Choice Aggregators (CCAs) have joined as partners and offer an additional incentive to their customers for this technology. BayREN also coordinates with CCAs that do not participate in the mid-stream program but offer their own incentive for electrification measures. This is accomplished through collaborative marketing campaigns, collateral, and communications to prospective and active contractors. As such, leveraging a different funding source, BayREN is working to create an emerging energy solution; that is, a regional program model to promote decarbonization in homes and transform the market.

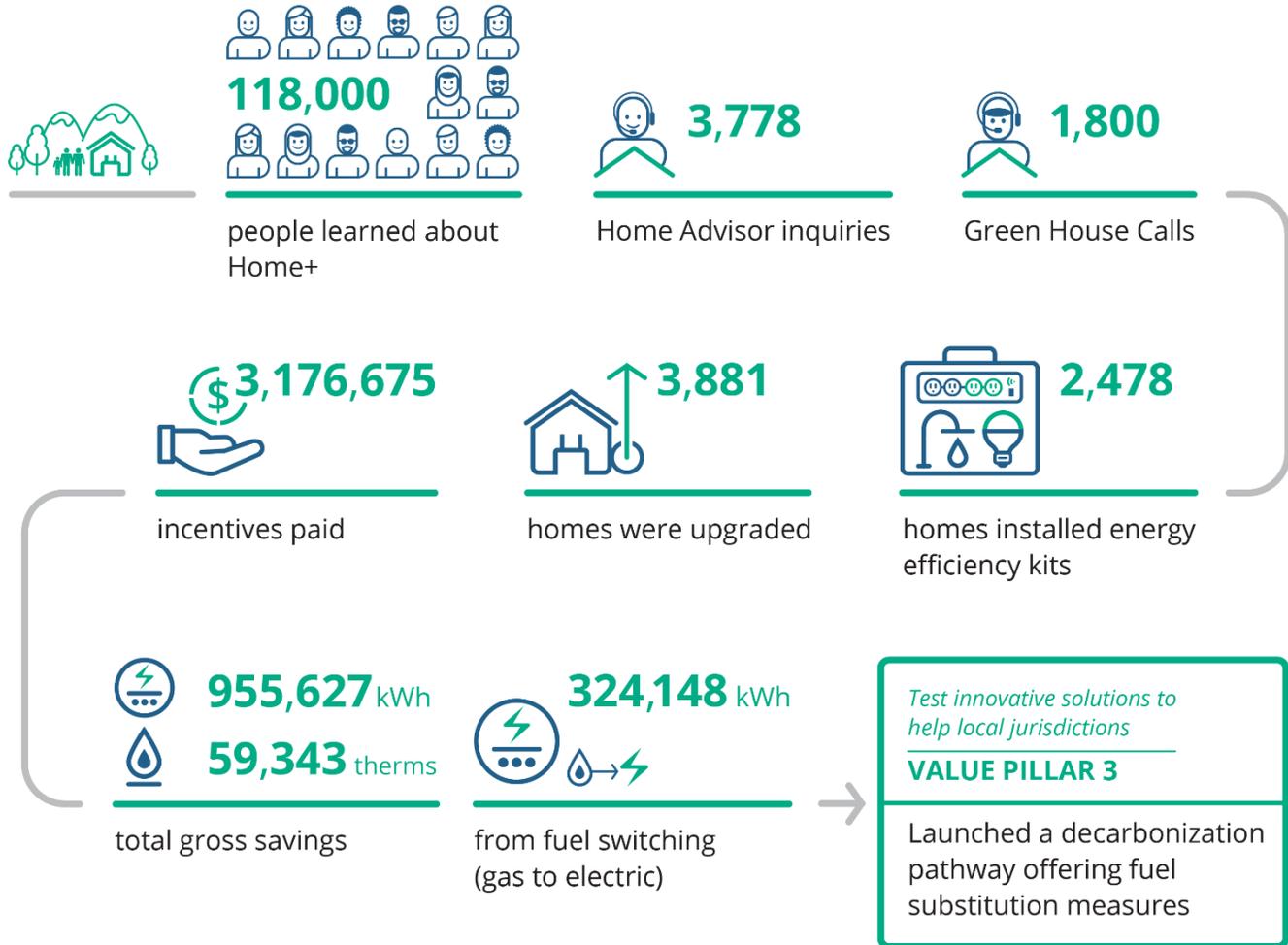
The Home+ program is readying the local contractor market for fuel substitution projects that will help Bay Area communities reduce GHG emissions from buildings. The Home+ program allows local contractors to get experience with projects that include fuel substitution measures so will become proficient with the installation of and marketing of these technologies. Through training and project experience (which provide practical application and familiarity with the measures), the BayREN program is building a community of experienced local contractors that help to ready the region for the future.

2020 Home+ Focus

- Reached local difficult-to-serve customers
- Established COVID protocols
- Launched an online learning system for participating contractors
- Virtual Energy Advisor workshops and presentations
- Increased outreach in Spanish
- Added \$1k incentive to projects that combined heating/cooling with building shell measures
- Piloted electrification measures for fuel substitution

FIGURE 2 HOME+ ACCOMPLISHMENTS

| Single Family Home+ Program Accomplishments



COVID-19 Impacts

Shelter-in-place restrictions caused an immediate impact on this program. In an effort to keep participating contractors engaged during the work stoppage, with an additional goal of having a better trained workforce, the program launched an online Learning Management System (LMS) in April to allow contractors to take 36 energy efficiency and electrification training at no cost. The LMS provides on demand webinars, eliminating the previous fixed time trainings. Over 22 contractor firms attended at least one webinar. This streamlined enrollment of new contractors resulted in several new participating contractors in the second half of the year.

The Quality Assurance/Quality Control (QA/QC) process was also virtualized using an Augmented Reality (AR) app to remotely conduct the process. This decreased the travel costs associated with these reviews and served as a testing ground for utilizing video visits for other purposes such as enhanced

advisor services and as a training tool for developing youth employment. Further, the safety of the residents and contractors was better protected with one less home visit.

The program also required all contractors to attend a COVID-19 Safety Protocol training and sign an agreement that they would abide by all applicable state and local health regulations. Subsequently, we created a video explaining the safety precautions our contractors agreed to in order to allay concerns by potential program participants.

Finally, an additional \$1,000 incentive for projects that combined a heating and/or cooling measure with a building shell measure was added to help stimulate the market.

Energy Benefits to Customers

In 2020, approximately 4,509 unique customers completed improvements with Home+ participating contractors receiving \$3,176,675 in incentives and 2,478 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. Participants saved a total of 955,627 gross kWh and 59,343 gross therms, with 324,148 gross kWh attributed to fuel substitution measures.

Non-Energy Benefits to Customers

The Home+ program offers the Energy Advisor service, which operates as an impartial help line and directs residents to resources, whether that is for Home+ or other complementary programs. The Energy Advisors responded to 3,778 inquiries and made 358 referrals to complementary programs. The program also completed 1,312 contractor support cases. Across the Single Family program's marketing and outreach efforts, 38 homeowner workshops and four presentations were given virtually to community groups and 15 direct mail campaigns to 118,00 recipients promoted the Home+ program and other relevant events.

Gaps Being Filled

The program continued to address local difficult to serve populations in the following ways:

- A series of four Spanish language webinars were held in early December to provide information about the resources and rebates that are available through BayREN. Over 80 people registered and 37 attended. In addition, several counties sent letters to households with information in Spanish about BayREN programs.
- Working with Rising Sun Center for Opportunity, a nonprofit that employs local youth to conduct basic home energy assessments and install energy and water saving fixtures, 1,800 "Green House Calls" were completed. This year, the assessments were completed virtually via an online survey and follow up call and the fixtures were mailed out as an energy efficiency kit. The focus on local difficult to serve communities and language support resulted in 34% (826/2,412) of respondents coming from households where a non-English language is spoken and 37% (893/2,412) of respondents identifying as moderate income.

Piloting of Activities

BayREN launched rebates for fuel substitution measures on March 1, 2020 including heat pumps for heating and cooling, heat pump water heaters, induction cooktop/ranges and heat pump clothes dryers. This has resulted in 163 measures installed, and 15,126 therms saved.

BayREN has also partnered with local CCAs on the Regional Heat Pump Water Heater Contractor Program to provide a cohesive experience for consumers. This included coordinated contractor outreach and recruitment, data sharing agreements to reduce paperwork and the creation of co-branded collateral. This has also laid the groundwork for other potential collaborations that combine upgrades into a cohesive package. The Technology and Equipment for Clean Heating (TECH) program established by SB 1477 to further decarbonization is partially modeled on the BayREN Midstream Program and will bring opportunities to homes statewide in 2021.

Local Government Levers

The local governments that comprise BayREN have been utilizing their credibility, partnership building capacity and access to data to promote the program. For the Single Family program, our county member agencies were able to send letters on local government letterhead to the LDTS audience (moderate income and in other languages) to inform them of program offerings. Often, these letters included mentions of complementary programs such as the Rising Sun Green House Calls, and promoted the webinars, including the Spanish language events.

BayREN worked with the counties to engage workforce development training centers to bring appropriate trainings to the underemployed and underserved. Individual counties also began to engage their workforce development boards to connect job seekers to opportunities in residential energy efficiency work.

Future Opportunities

BayREN Value Pillar 1 Building Organizational & Human Infrastructure

BayREN is building deeper relationships with manufacturers/distributors to better integrate the appropriate products into the program. Continued engagement with the supply chain will also allow the program to receive immediate feedback on the obstacles and benefits of the program for the installers and help us to refine our program parameters. Subsequently, the manufacturers and distributors can serve as allies in presenting the program to their installers and encourage market adoption of the measures.

BayREN is also engaging with workforce development groups to increase the pool of trained workers. Participating contractors were generally busy especially after the COVID-19 work stoppage was lifted and reported that they had a need for more qualified workers. BayREN will look to leverage any potential stimulus funds coming to the counties in the next few years to increase the capacity of our contractors as well as provide an infusion of youth to the generally aging contractor population. The program will also work specifically with Rising Sun on developing a remote auditing skill set so that their youth workers will have a technological expertise that contractors may seek for efficiency and safety reasons.

BayREN Value Pillar 2 Serving LDTs

Since many of our target moderate income population are renters, it has been difficult to provide resources in the traditional energy efficiency program sense since renters are often unable to make improvements to their homes. The program will begin to engage landlords with a capital investment message to emphasize the benefits of replacement before burnout of equipment. The Single Family program will work with the BayREN Multifamily program, who has already had success engaging with landlords, to provide a single integrated message to landlord associations whose members can participate in either or both programs.

BayREN will also continue to expand outreach to non-English speakers. Spanish language workshops began in 2020 and will continue in 2021 with increased focus on building relationships with local media. The program is also beginning to engage Chinese media and is planning a webinar series for Fall 2021. Digital ads will also be developed in other languages and served to those who self-identify preferring another language using browser or Facebook settings.

BayREN will continue to establish connections with other groups that serve the LDTs population such as HUD counseling program providers and community groups serving ethnic communities. With the onboarding of bilingual staff and building partnerships with organizations that already work with LDTs communities, BayREN hopes to expand both the number of contractors who can offer services in language as well as provide information to residents appropriately as well.

BayREN Value Pillar 3 Testing Innovative Solutions

BayREN will continue offering the decarbonization measures launched in March 2020. The Single Family program has exclusively offered contractor installed measures in the past but started offering two consumer rebates, induction cooktop/ranges and heat pump clothes dryers, for the first time. This necessitates outreach through retail channels for the first time especially to kitchen appliance showrooms. The program began to explore building these relationships in 2020 and will ramp up conversations with these retailers in 2021.

BayREN's Contractor Midstream HPWH Program has been responsive to the pandemic and the market and incorporated new solutions that will be addressed into the statewide TECH program, led by partner Energy Solutions. By innovating and implementing, BayREN leads the way for broader decarbonization beyond the region.

One obstacle that has consistently been identified is the need for paperwork to be completed to receive rebates. In other programs, upstream rebates at the manufacturer or distributor level have been very successful because the processing is centralized at the top of the supply chain. BayREN is looking into the feasibility of offering an upstream rebate or partnering with another organization and/or funding to realize this concept.

Another obstacle, particularly with heat pump water heaters, is that it can be very difficult to replace gas water heaters on burnout due to wiring and panel requirements. BayREN is exploring a "Cash for Clunkers" like program or messaging that emphasize replacing before burnout to overcome these obstacles.

Green Labeling

In California, improving the energy efficiency of existing residential buildings has become an urgent priority for state, regional and local governments. Making significant and lasting reductions in residential energy use requires sustained, multifaceted interventions to motivate *the public* to invest in energy efficiency and other green home improvements. In support of the State’s urgent priority to improve the energy efficiency of existing buildings, BayREN’s Green Labeling program is training real estate professionals so that they understand the benefits of an energy efficient home and then market green homes at the time of sale. As such, this program is helping to build capacity. The program is also promoting and scaling mechanisms (e.g., the DOE’s Home Energy Score) that make home energy assets² transparent.

This infrastructure within local communities encourages energy efficient investments at critical moments—the time of a home’s sale, before a major renovation, or as a starting point to a homeowner’s energy efficiency journey. Making these investments at critical points in time will have a long-term effect on both the buildings and the larger community.

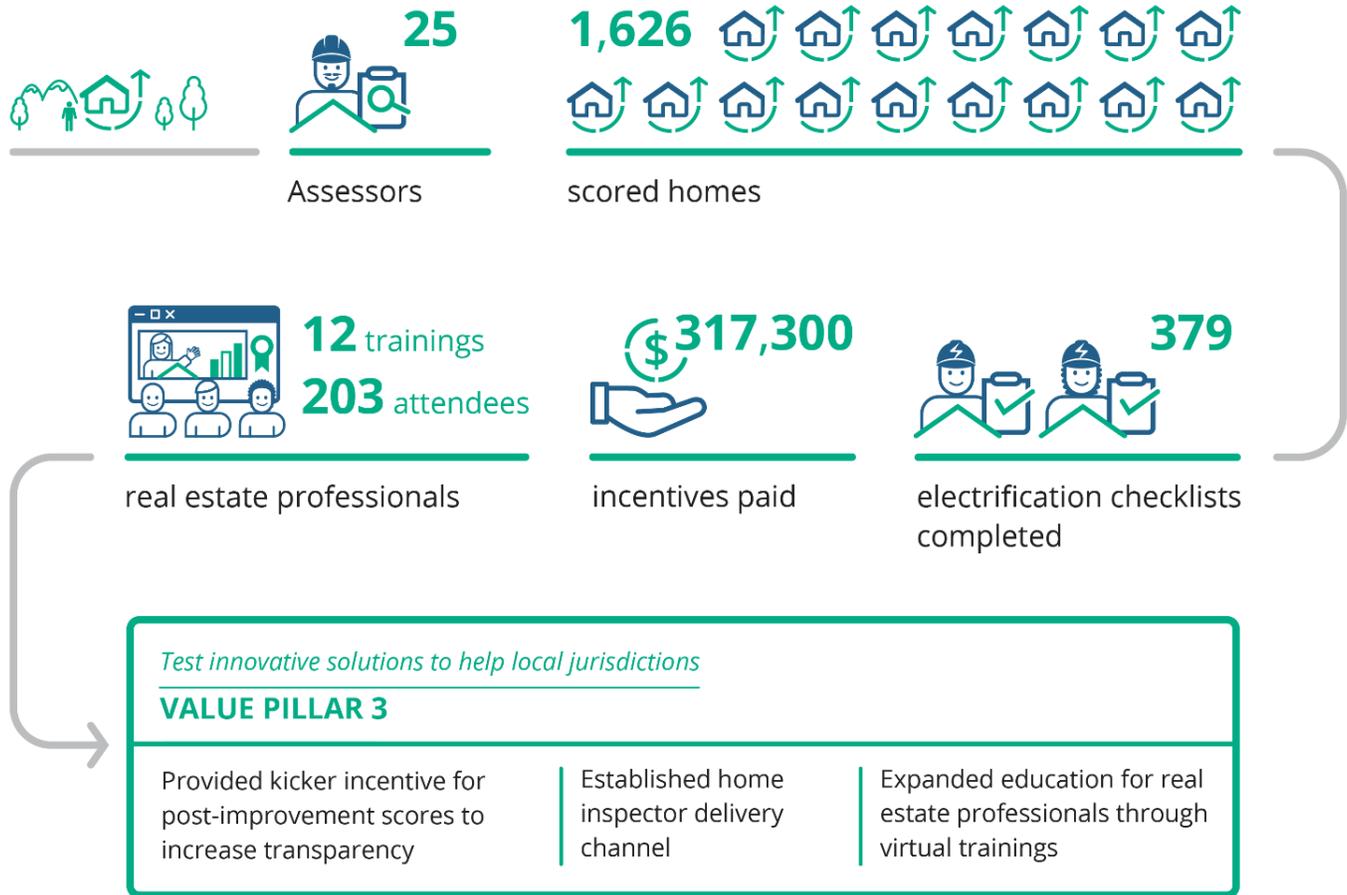
2020 Green Labeling Focus

- Introduced COVID-19 protocols
- Suspended County incentive limits
- Launched the “electrification checklist”
- Pivoted to remote-field mentoring
- Added post-improvement incentive kicker
- Continued support with local reach codes

² HEScore evaluates the assets of a home (appliances, insulation, windows, etc.) that determine how efficient a home is.

FIGURE 3: GREEN LABELING ACCOMPLISHMENTS

| Green Labeling Program Accomplishments



COVID-19 Impacts

The Green Labeling program faced a challenge during shelter-in-place since both the Home Energy Score (HEScore) and real estate trainings were traditionally delivered in-person. In response, all real estate trainings were transitioned to an online/virtual format. Due to the slowdown in the real estate market during shelter-in-place, we observed an increased demand for trainings. Accordingly, we expanded our offerings, resulting in a record number of real estate professionals trained in a program year (212 trained with an initial goal of 100) and an increased average class size compared to 2019.

The HEScore portion of the program was more heavily impacted as Assessors could not go into homes except for emergencies for several months. The total number of scores in 2020, therefore, was lower than previous program years with 1,626 scores provided by 25 Assessors, totaling \$317,300 in incentives. 379 homes received an “electrification checklist” and 15 homes received a post-improvement score. As the DOE HEScore partner there were also several modifications that had to be made. On-site QC of scores was transitioned to a remote process and the Program team-maintained support and

communication with Assessors on the suspension and re-instating of qualifications to remain an “Active” Assessor per DOE guidelines. When Assessors were able to resume HEScores, they were required to review and agree to follow State and local safety and health guidelines. To encourage Assessors to score as many homes as possible, the limits on rebates claimed per county were suspended and, once Assessors were safely able to go into homes again, monthly HEScores picked up to previous program year levels.

Lastly, the Green Labeling program intended to do specific outreach and recruitment targeted at home inspectors. This activity was postponed to future programs years when outreach can be done in person again, as it was deemed that the effort would likely not be as successful in a virtual setting.

Gaps Being Filled

While homeowners may know that their house is drafty or uncomfortable, they may not know exactly where to begin to make energy efficiency improvements, or how their home compares to similar ones. The HEScore acts as a low-cost tool to close this information gap. While full energy audits can provide a wealth of detailed information, the cost and length of time to complete can be a barrier to wide scale adoption. Audit reports also do not provide for an easy to understand, direct comparison between homes like the HEScore offers with its 1 to 10 scale. The Score and report can be useful when buying or selling homes as a comparison tool or to identify improvements that can be made before embarking on a home renovation. Other than by BayREN, HEScore is not offered in the Bay Area.

The Green Labeling program’s electrification checklist fills a gap in training the current workforce on newer electrification technologies and what makes a house a good fit for the switch from gas to electric appliances. Collection of information both through the Score and the electrification checklist provides accurate information about the Bay Area’s housing stock that can help inform policy and how best to target homes for efficiency upgrades.

Piloting of Activities

In August 2020, the Green Labeling program launched an electrification checklist as an addendum to the HEScore. This pilot was developed in response to the State’s efforts to decarbonize buildings and Assessors’ interest in learning more about electrification. To complete the checklist, Assessors collect additional data points that relate to the home’s readiness for electrification such as electrical panel capacity, stove and dryer fuel types, and additional information about the location of the hot water heater. Based on this additional information, Assessors were trained on what makes a home a “good” or a “great” fit for electrification recommendations. If the checklist is complete, the Assessor can receive a \$100 bonus incentive per home. From its inception in August through the end of 2020, nearly 400 electrification checklists were completed.

Local Government Levers

The Green Labeling program utilizes local governments for outreach and relationship building. As the audience for the HEScore largely overlaps with the Home+ program, local governments discuss the HEScore at homeowner workshops. The program also relies on local governments for communication and partnership with local associations of Realtors. This relationship building is useful in finding co-

hosts for real estate trainings and helps to develop local realtors as BayREN stakeholders who may inform their clients about HEScore, Home+ rebates, or other BayREN programs.

Additionally, the Green Labeling program works closely with jurisdictions who have or are considering using HEScore as part of a mandatory ordinance, such as the City of Berkeley’s Building Emissions Savings Ordinance (BESO) and the City of Piedmont’s existing building reach code, on how the Score can help them achieve their goals. As such, there is ongoing collaboration with the BayREN Codes and Standards program.

Future Opportunities

BayREN Value Pillar 1: Building Organizational & Human Infrastructure

In 2021, the Green Labeling program will continue to build the capacity of real estate professionals to accurately value and market energy efficiency in single family homes through trainings and partnerships. The Program also hopes to further relationships and enroll more Assessors, including home inspectors, to increase the number of HEScores and improve accessibility in all nine Bay Area counties.

BayREN Value Pillar 3: Testing Innovative Solutions

In 2020, the Green Labeling program continued to test the HEScore as an effective tool for increasing energy transparency in single family homes. BayREN’s program received a DOE HES Partner innovation award for successfully building and expanding a voluntary HEScore program in the nine-county San Francisco Bay Area, with over 8,000 scores performed since 2015. In 2021, the Green Labeling program intends to increase the uptake of the HEScore, as well as look for opportunities to improve the Score and HEScore Report to provide more value as a voluntary informational tool, but also potentially for building code applications.



Bay Area Multifamily Building Enhancements (BAMBE)

The BAMBE program contributes to the overall BayREN mission by reaching multifamily communities that are local difficult-to-serve populations and are not well served by traditional programs such as those in small (<100 unit) or owner-occupied MF buildings. New to 2020, the program established a set of targeting criteria to ensure the prioritization of multifamily property types that energy efficiency programs have unsuccessfully served. A property meets the targeting criteria if it:

- Contains less than 100 units.
- Is a deed-restricted or naturally occurring affordable property.
- Has a resident ownership structure such as an HOA or co-op.
- Is located within a disadvantaged community (determined by the AB 1550 Low-Income Communities map).

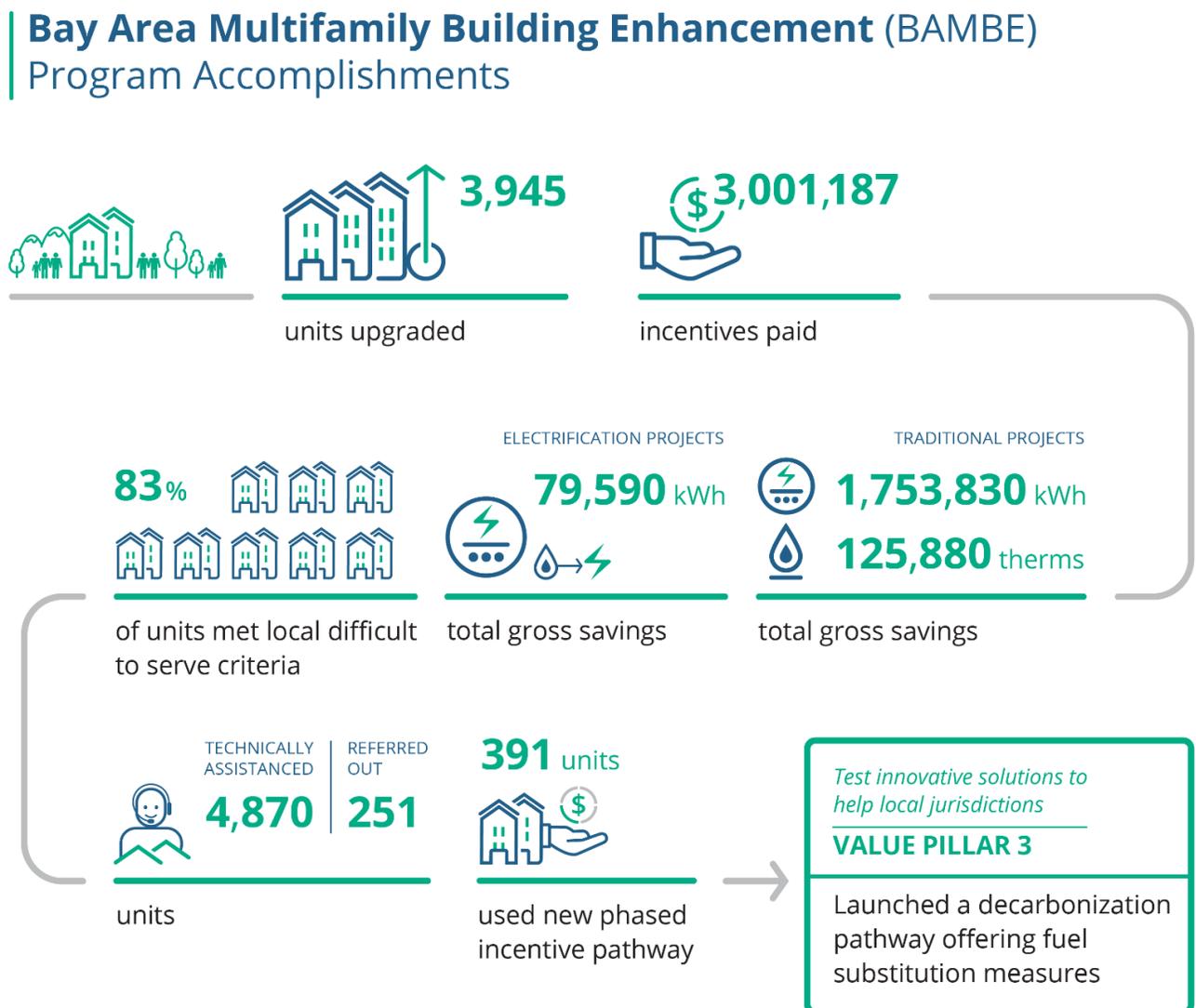
2020 BAMBE Focus

- Established targeting criteria for difficult-to-serve communities
- Introduced COVID-19 protocols
- Performed outreach activities virtually
- Launched a Clean Heating Pathway to address electrification barriers
- Assisted participants with COVID-related cash flow issues with phased incentives

Properties that do not meet at least one of these criteria are put on a waitlist and admitted into the queue periodically if there is availability in the pipeline.

In addition, the program is working to test an innovative solution: creating a zero net carbon (ZNC) pathway for multifamily buildings. Through the administration of an electrification pilot launched in 2019, the program developed insights on the technical assistance and design components that have the potential to incentivize property owners to upgrade from gas to efficient electric water heating, space heating, and cooking technology. The program took the lessons learned from that pilot to develop the Clean Heating Pathway, which launched in 2020, and provides incentive adders, technical assistance, and a phased gas elimination plan for participants with scopes of work that includes at least one electrification measure and no gas-to-gas measure improvements. Through the Clean Heating Pathway, the program seeks to address barriers to electrification in the multifamily sector which include insufficient electrical capacity, high material and labor costs, and contractor unfamiliarity with heat pump technology.

Figure 4: BAMBE Accomplishments



COVID-19 Impacts

Throughout the COVID-19 pandemic, the BAMBE program has remained committed to aiding multifamily properties undertaking energy and water efficiency upgrades. Technical assistance providers established and implemented remote program operations where possible and continued to process new applications. When on-site assessments were permissible and necessary, technical assistance providers did not enter occupied apartment units, and followed recommended health and safety measures. Outreach activities continued but were moved to virtual platforms.

To assist program participants experiencing cash flow disruptions due to the effects of COVID-19, the program created a phased incentive pathway, which permitted the disbursement of 25% of incentives at the time of scope approval. By providing a portion of the incentives prior to the completion of the project, contractors had the cash needed to move projects along. There were 6 projects that took advantage of this pathway in 2020.

Energy Benefits to Customers

BAMBE has maintained its popularity since inception in 2013 and to-date 41,075 units, totaling 568 projects have been upgraded. In 2020, 39 projects representing 3,945 units completed upgrades receiving \$3,001,187 in incentives, leading to 1,753,830 gross kWh and 125,880 gross therms saved for traditional projects and 79,590 gross kWh from electrification projects. Average project size was 101 units and average estimated energy savings per project was 18%.

Non-Energy Benefits to Customers

BAMBE provides no-cost technical assistance and complimentary referrals for projects that do not meet our criteria. In 2020, the program provided technical assistance to more than 4,870 units and the program referred out 251 units to multifamily family programs like MCE, PG&E or local energy watch programs.

The BAMBE program also held an electrification-themed workshop in July 2020, which provided general information about the benefits and technology behind efficient heat-pump and induction technology. The program also provides free referrals to any interested participant that does not meet the program's targeting criteria. Eight prospective participants were referred out at intake and six participants were referred out during technical assistance. Additionally, seven participants received financing technical assistance.

Gaps Being Filled

The BAMBE's targeting criteria, described above, ensures that outreach is prioritized at those multifamily communities that have struggled to access energy efficiency programs due to program design and delivery. In 2020, 83% of completed projects met at least one targeting criteria, while some met multiple LTDS criteria.

Local Government Levers

As has been done every year, local governments, seen as trusted messengers, conducted program outreach using data available to them. In 2020 we leveraged local government knowledge to provide official COVID related links and resources to interested participants.

Future Opportunities

BayREN Value Pillar 2: Serving LDTs

Naturally Occurring Affordable Housing (“NOAH”) buildings have not been well served by multifamily energy programs because programs have had difficulty identifying them, and owners have fewer resources to engage and pay out-of-pocket costs associated with upgrade projects. The issue of identification stems from the lack of a consistent definition and data. Through a pilot with Santa Clara County, BAMBE proposes to address this issue by performing a gap analysis of publicly available census and assessor tax data to determine what information is missing that will help identify NOAH properties, their owners, their tenants, and the organizations interacting with all three groups. The program plans to engage NOAH stakeholders and gain insights that will help BayREN and other programs better identify and serve the owners and residents of NOAH.

BayREN Value Pillar 3: Testing Innovative Solutions

BayREN will continue offering the decarbonization measures launched in 2020 to overcome electrification barriers with multifamily properties. In 2021, fuel substitution measures including heat pump water heaters, heat pump clothes dryers, heat pump HVAC, heat pump pool heaters, and induction cooktops will continue to be offered. As part of this electrification effort, the program is tracking non-energy efficiency measures like electric panel upgrades that property owners must make to switch from gas to electric appliances. This data will continue to inform strategies for overcoming multifamily barriers to achieving state and regional electrification goals.



SMB Commercial

The SMB Commercial program consists of two subprograms: BayREN Business and BayREN Microloan. Together, they contribute to the overall BayREN mission by providing energy efficiency rebates and services to SMB, with a focus on hard-to-reach (HTR) and disadvantaged communities (DAC). By definition, SMBs are a local and difficult to serve population. BayREN defines SMBs as meeting one of three criteria: less than 50,000 sq. ft. in size; use less than 500,000 kWhs/year; or use less than 250,000 therms/year.

A business is considered HTR if it is geographically located in a DAC *and* meets one of the criteria below:³

- Language – Primary language spoken is other than English.
- Size – Less than ten employees and/or classified as “Very Small” (customers whose annual electric demand is less than 20 kW or whose annual gas consumption is less than 10,000 therms).
- Leased or rented facilities – Investments in improvements to a facility rented or leased by a participating business customer.

2020 SMB Commercial Focus

- Established COVID-19 protocols
- Secured and contracting with a new implementer
- Targeted hard-to-reach and disadvantaged communities
- Established a performance-based model
- Continued Microloan program success

³ Definition per CPUC D.18-05-041 page 46.

Alternately, if the business is located outside of a DAC, it must meet all three criteria above to be qualified as a HTR business.

BayREN Business is testing an innovative solution: using a performance-based model specifically to engage SMBs. A performance-based model aligns rebate amounts with actual energy usage over 24 months and offers several benefits. First, a performance-based approach provides SMB customers with the ability to obtain energy savings with lower upfront costs. Next, SMB customers are offered flexible solutions that shield the customer (and ratepayers) from paying for expected savings that fail to materialize. Also, it encourages maximizing savings from a wholistic set of measures. Lastly, because the post-retrofit monitoring period is 24 months, this model leads to sustained energy savings. Overall, BayREN Business and its performance-based model overcome challenges SMB customers have, such as thin financial margins and/or do not view energy efficiency as a direct business investment.

Despite adverse economic conditions and a belated start to the program, the BayREN Microloan program is gaining attention in the SMB communities. Working in partnership with Mission Asset Fund, a local, San Francisco-based, non-profit lender, BayREN Microloan opened for enrollment in November. Within 2 months, Mission Asset Fund closed two loans and received 36 applications. Some of the applications received were not fully completed while others were submitted by businesses close to, but outside of, the BayREN service territory.

COVID-19 Impacts

The COVID-19 pandemic severely impacted the BayREN Business program. The county health shelter-in-place order in March 2020 halted marketing activities. Additionally, given the confusion about what constituted an essential business, the planned projects were cancelled. Due to extensions on shelter-in-place orders, by July 2020, many SMBs closed including the program implementer.

BayREN Business worked diligently to ensure businesses in the project pipeline received updates. At the same time, BayREN Business became increasingly concerned with the SMB sector's energy usage patterns. Many SMBs closed. Those that remained open either had significant reduction in energy usage or increases in usage due to hyperactivity (like grocery stores). These atypical energy usage patterns adversely impact enrollment eligibility and before-and-after energy usage comparison, a central component of performance-based program.

Confronted with a spectrum of challenges, BayREN Business prioritized solutions. First, the program identified and contracted with a new implementer who is concurrently implementing a performance-based SMB program in New York state. Their SMB experiences under the New York program helped inform solutions in the Bay Area. Next, BayREN Business collaborated with a working group of industry stakeholders, experts, and its Measurement & Verification (M&V) provider to discuss mitigation strategies for pandemic energy usage patterns. Together, the group developed a new M&V plan to accommodate varying patterns during the pandemic. Although the pandemic impact adversely affected BayREN Business enrollment, the program emerged from 2020 with a new implementer and a new M&V plan that accommodates the pandemic and other future disasters.

Energy Benefits to Customers

BayREN Business did not have any program participants that completed projects in 2020, thus there are no energy savings to report for 2020.

Non-Energy Benefits to Customers

BayREN Business did not have any program participants that completed projects in 2020. However, the former program implementer did send energy efficiency reports to approximately 19 SMBs. Each report details energy efficiency savings potential, resulting utility savings, simple payback analysis, and next steps.

Gaps Being Filled

Despite the unforeseen challenges, BayREN Business was able to fill gaps in 2020. Specifically, as many legacy direct-install programs ramped down in 2020, BayREN Business became the only SMB program remaining, allowing for numerous referrals including from PG&E and CCAs.

Piloting of Activities

Notably, the BayREN Business piloted two activities in 2020: 1) SMB-targeting with interval data to identify specific energy efficiency opportunities in a sea of PG&E and CCA accounts; and 2) fully developing a M&V plan that accommodates the pandemic-affected energy usage as a large non-routine event. Data-targeting is common with residential programs, but few have deployed it for the SMB sector. In 2020, BayREN Business, in collaboration with its implementer, and a data-analytics firm, successfully identified and implemented the data-filters necessary to screen for ideal program participants. The data-filter also screened out past ratepayer program participants which simplified the double-dip check process. Finally, the data also served to provide the pool for the M&V comparison group.

The pandemic caused many SMBs to either stop using energy, significantly reduce their energy usage, or increase in energy usage (such as grocery stores). These three profiles are problematic to BayREN Business and its performance based approach. The pandemic energy usage baselines are not representational to their typical energy usage profiles. Therefore, many SMBs are at risk of being ineligible or having the savings skewed dramatically.

To solve this problem, BayREN Business partnered with its M&V provider and the Normalized Metered Energy Consumption Working Group (consisting of performance-based programming and M&V experts and stakeholders) to fully develop a comparison group M&V plan. This plan enables BayREN Business to comply with the CPUC NMEC Rulebook. More importantly, it enables BayREN Business to enroll pandemic-impacted SMBs. The comparison group M&V will compare energy usage of BayREN Business projects against businesses that have similar energy usage profiles but without undertaking any energy efficiency interventions. Comparison group M&V allows BayREN Business to make an apples-to-apples comparison. Developed by consensus from industry stakeholders and experts, this plan is remarkable because it not only serves BayREN Business, but also other NMEC programs experiencing similar challenges.

Local Government Levers

BayREN Business conducted limited engagement with economic development councils to identify its potential roles in the pandemic recovery plan.

Future Opportunities

BayREN Value Pillar 2 Serving LDTS

BayREN Business has a focus on HTR SMBs. In 2021, the program will endeavor to develop more specific approaches, such as increased incentives, to recruit HTR SMBs into the program.

BayREN Value Pillar 3 Testing Innovative Solutions

Common to large and industrial commercial sectors, the NMEC approach is novel to the SMB market. As such, in the future, BayREN Business will continue to test – and refine – the performance-based approach to this market segment. Relatedly, the targeting for energy efficiency opportunities and comparison group M&V will also be tested and refined over the course of program implementation.

Codes & Standards

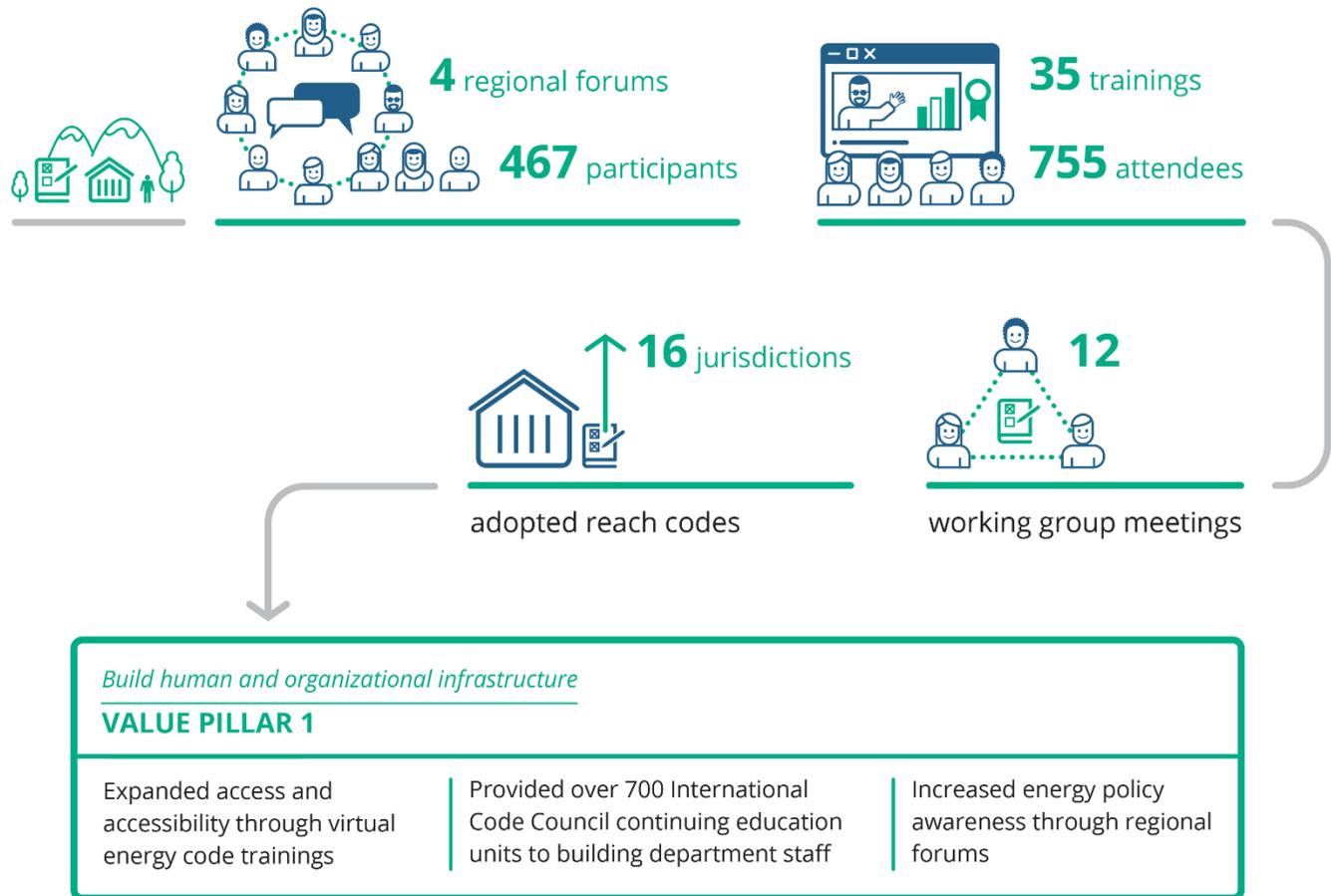
The Codes & Standards Program works directly with local governments and their staff. This program contributes to the overall BayREN goal of GHG reductions and energy savings by expanding building department and other local staff knowledge of energy code requirements and energy policies. The support and investment in local government staff helps local governments make—and follow through on—energy codes and policies to help save energy and reduce GHG emissions. The Codes and Standards program also facilitates the institutionalization of code-related tools within Bay Area communities and supports the development of state level energy policies and reach codes for local jurisdiction. BayREN’s relationships with local governments puts them in a unique position to work with local government building departments and energy policy staff.

2020 Codes and Standards Focus

- Transitioned to online trainings and events
- Updated the ePermit Tool
- Collaborated with 3C-REN
- Co-developed training with Energy Code Ace
- Added reach code training

FIGURE 5: CODES & STANDARDS ACCOMPLISHMENTS

Codes & Standards Program Accomplishments



COVID-19 Impacts

The Codes & Standards Program had to postpone in person trainings scheduled for mid-March and April of 2020 and transition to an online platform. These trainings were rescheduled and offered as live online classes in May and June, and BayREN has continued to offer trainings in this format ever since. Similarly, our quarterly Regional Forums also transitioned to live online events. While we have found that the online format is more challenging in some ways, it also has some advantages in making it easier for staff at smaller and more remote jurisdictions to participate more easily. This, together with the fact that many local government staff had more time since working from home due to the pandemic, meant that we had record numbers of participants in our trainings, 755 in 2020 compared to 534 in 2019, and the number of people attending Forums remained basically steady, 467 in 2020 compared to 483 in 2019.

The move to online platforms due to COVID-19 restrictions allowed for greater collaboration with other program administrators. In 2020, BayREN began collaborating with several partners on trainings in order to leverage each other’s efforts and better reach our target audiences. As 3C-REN began

operations, they used several curriculums in 2020 that were based on BayREN-developed curriculums. We also expect to offer some trainings based on 3C-REN-developed curriculums starting in 2021. 2020 was also the first training collaboration between BayREN and the Energy Code Ace team, with joint development of a training on Quality Insulation Installation. This training draws on the strengths of both programs and was provided twice in 2020. It will also be offered in 2021. Finally, BayREN developed and started offering a training on reach code implementation and enforcement, and for that we partnered with Peninsula Clean Energy and Silicon Valley Clean Energy to include information about electric vehicle reach code compliance and to better reach the cities in their service areas.

Gaps Being Filled

BayREN's Codes and Standards Programs has a number of activities underway, all designed to fill gaps that our local government members have identified. For example, our trainings are almost exclusively for local building department staff and are designed to recognize and address their constraints. As such each training is relatively short (60-90 minutes) and focuses on best practices and approaches that attendees can use to make the most out of available time. One new training added in 2020 was a reach code training, to help local government staff enforce local reach codes. With nearly a third of jurisdictions in the Bay Area having adopted reach codes, implementation and enforcement is essential.

Quarterly Forums provide information for local government staff on new or current topics, such as benchmarking, as well as opportunities for different stakeholders to connect and share their perspectives. These fill a gap in that all forums are aimed at local government staff. The events are free and open to all, and in addition to local government staff, attendees regularly include staff from state and regional agencies, building professionals, energy consultants, and others with an interest in the topic, creating opportunities for connection and cross-education. Forums provide information about energy-related topics of interest to local government staff and help staff build their knowledge of these issues, the opportunities they provide, and their complexities.

The Codes & Standards Program also provides the following resources and services, which are aimed at the gaps summarized below:

- **Municipal ZNE/ZNC Technical Assistance** – This program provides free engineering technical assistance to local governments interested in completing a ZNE/ZNC municipal building project, helping them minimize energy use and find opportunities for renewables to provide that energy. The program is designed to inform local government staff about how to develop ZNE/ZNC projects in order to encourage adoption of ZNE/ZNC policies and provide opportunities for local governments to lead by example.
- **Energy Policy and Reach Code Working Group** – Local government staff have the opportunity to come together every other month to hear about new resources related to energy policies and connect with each other to compare notes and learn from peers.
- **Permit Guides and Assistance Sheets** – These are short guides which can be used as a handout at the counter (permit guides) or as a quick reference for building department staff (assistance sheets), on topics where a need has been identified.
- **Electronic Tools** – The Codes and Standards Program has been testing electronic tools as ways to make energy code enforcement easier for local government staff and to improve compliance.

The ePermit Tool educates project applicants about common types of projects such as re-roofing, water heater replacement, and window replacement. The CodeCycle Tool provides electronic plan-checking for commercial lighting projects as well as assistance for building inspectors.

Local Government Levers

The main local government lever used in the Codes & Standards Program in 2020 was the relationships that county members have with local government Sustainability, Public Works, and Building Department staff. These relationships allow for two-way communication, so that local government needs can be communicated directly to BayREN, and staff can be informed of offerings relevant to them.

Future Opportunities

BayREN Value Pillar 1 Building Organizational & Human Infrastructure

One of the major efforts of the Codes & Standards Program in 2021 is updating our Training Plan. Due to COVID-19, BayREN transitioned from a completely in-person training model with each training offered to staff of a single jurisdiction to online training where people throughout the Bay Area can all join a single training. As a result, we had to change every component of our training program, including how trainings are scheduled, marketed, provided, and assessed. The training plan update is intended to take a more deliberate look at each of these components to improve how well our online training program operates. In addition, we will also be planning for a time when we can hold in-person trainings again. One advantage of the online trainings is that they have made our trainings available to more local government staff throughout the Bay Area. At the same time, our in-person trainings offered opportunities for connection and digging deeper into jurisdiction-specific issues which are difficult to provide online. As part of the training plan update, we will be developing a strategy for combining these approaches.

The Codes & Standards Program is planning to administer a survey to all Bay Area building departments in 2021, to collect information about their daily operations and the types of support they would find most useful. This information will be used to inform the training plan update as well as other Codes & Standards offerings.

One opportunity anticipated in 2021 is coordination with the statewide TECH (Technology and Equipment for Clean Heating) program authorized under SB 1477. We have already discussed with the TECH team how BayREN can support TECH efforts and will be working with them to coordinate trainings and to improve permit processes.

Water Upgrades \$ave

In California, the pumping, heating, and treatment of water comprises 20 percent of electricity and 30 percent of non-power-plant natural gas demand. Known as the *water energy nexus*, this combined resource opportunity is the subject of CPUC rulemakings designed to explore how energy savings can be captured through water conservation to inform efficiency program design.

Water Upgrades \$ave is a new regional water energy nexus program based on three pilots conducted over the past ten years. The Program facilitates utility investment in behind-the-meter efficiency improvements by providing municipal water utilities with project capital and managing program funding, marketing, customer enrollment, project installation, and customer service while giving utilities the power to decide which customers to target and how much to reduce demand. The capital for this program is not ratepayer funds, but rather is pursuant to a loan agreement with the Association of Bay Area Governments.

Water utilities can use the Program to meet state and local policy goals, support local-difficult-to-serve customers (e.g., low-and moderate-income customers and renters), and produce water and energy savings on the customer side of the meter. The program can be customized to supplement or replace current indoor and outdoor water conservation efforts to best meet each municipality's needs.

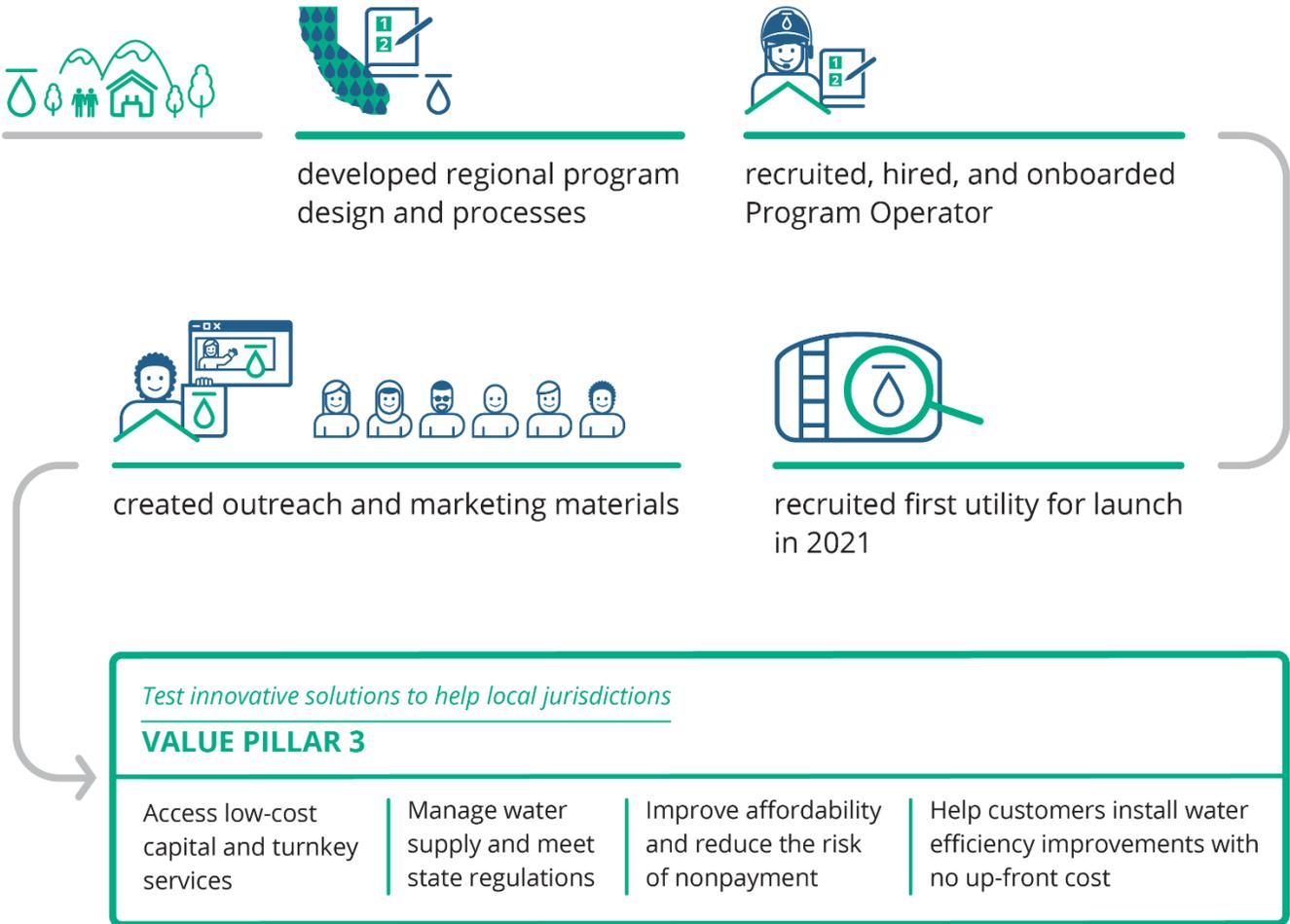
Water Upgrades \$ave helps water managers: (1) access low-cost capital and turnkey services; (2) manage water supply and meet state regulations; (3) improve affordability and reduce the risk of nonpayment and bad debt; and (4) give customers a water efficiency tool that does not rely on incentives or up-front costs.

2020 Water Upgrades \$ave Focus

- Developed program agreements and processes
- Established COVID-19 protocols
- Obtained initial line of credit
- Began recruiting partner utilities

FIGURE 6: WATER UPGRADES \$AVE ACCOMPLISHMENTS

| Water Upgrades \$ave Program Accomplishments



COVID-19 Impacts

There were few impacts to the program due to COVID-19 restrictions based on the timelines for program launch. In 2020, Water Upgrades \$ave developed regional program agreements and protocols, obtained capital funding, assembled an operations team, and initiated water utility outreach with the goal to begin delivery of customer services in early 2021. The program conducted all-remote meetings with implementation team members and prospective water utilities and made remote presentations to municipal councils. In 2020, the program established BayREN COVID-19 best practices for use when customer services requiring onsite visits begin in 2021.

Gaps Being Filled

BayREN's Water Upgrades \$ave is designed to bridge the gap between current and future water efficiency targets mandated by state legislation, whose goal is to make water conservation a California way of life. In 2020, the program prepared for the 2021 launch of its regional project financing service

using a new on-bill mechanism for obtaining water-related energy savings; these launch activities include creating the program design, forming partnerships, establishing branding, finalizing agreements, and hiring a Program Operator. The new regional program uses lesson learned from three pilots to address utility needs for a third-party finance service, a turnkey customer service that does not require utility administration, and the ability to scale water efficiency outcomes to meet new state and local targets.

Piloting of Activities

Using the authority granted in Senate Bill 564 — Water Bill Savings Act (2017), the Program established the funding, process, and agreements needed to implement the regional project finance service with its fiscal partner, the Association of Bay Area Governments. The program completed milestones including finalizing the Master Agreement for enrolling Partner Utilities, obtaining an initial \$1M line of credit to pay for completed projects, and designing the finance service process. This program that started as a pilot, has now been scaled regionally, and is poised to provide a model for a statewide approach.

Local Government Levers

In 2020, Water Upgrades \$ave used the following local government levers:

- Local government relationships with municipal and other water utilities to promote to the program. To activate the Joint Powers Authority role defined in California Senate Bill 564 — Water Bill Savings Act (2017), we completed an approved-to-form Master Agreement that enables ABAG to enroll Partner Utilities and made significant progress on developing a Finance Service Agreement between ABAG and RCPA to provide regional capital to support project installation. Program presentations given to the Sonoma County Regional Climate Protection Authority generated interest from the City of Sebastopol (which enrolled in January 2021), City of Cloverdale, and City of Petaluma.
- Access to regional water networks to outreach to water utilities and establish the program. The Program met with the Program Manager for the Bay Area Water Supply and Conservation Association (BAWSCA), which services 26 water utilities in Alameda, Santa Clara, and San Mateo counties, and presented to the Water Conservation Committee of the Solano County Water Agency, which serves Solano County cities and agricultural districts.

Future Opportunities

BayREN Value Pillar 1: Building Organizational & Human Infrastructure

As utility enrollment grows, Water Upgrades \$ave will increase local government organizational and human infrastructure by providing a turnkey investment and project installation service that enables utilities to meet their increasing water conservation targets with minimal staff and budget, freeing utility resources for other important needs.

New proactive state and local water goals, currently in development through 2027, create an opportunity to increase water-energy savings from customer-side water efficiency projects. Water utilities need a solution to reach these indoor and outdoor goals that is not constrained by limits on incentive funding, staff capacity, or the customer's ability to pay out-of-pocket costs.

Water utilities will participate because it helps their customers install water efficiency improvements with no up-front cost, using a utility-approved on-bill charge that is significantly lower than the estimated savings, so the customer begins saving right away.

Future opportunities include additional state-aligned services currently being researched include lead detection/repair and heat pump water heater projects.

BayREN Value Pillar 2: Serving LDTs

Because Water Upgrades \$ave is not a consumer loan program, it removes the upfront cost and debt barriers for participating water customers. Both property owners and renters can participate. Single family, multifamily, and forthcoming commercial customers receive utility bill savings right away and use a portion of the savings to pay off the project costs over time, thus decreasing the customer's household or business utility costs while increasing the value of the property with new efficiency upgrades.

Future opportunities include establishing long-term strategies for scaling finance service capital to meet program demand.

BayREN Value Pillar: 3 Testing Innovative Solutions

Customer water conservation programs traditionally rely on incentives, are operated by water utility staff, and require participating customers to cover the remaining out of pocket cost. This makes water conservation results dependent on limited incentive funding, utility staff capacity, and the customer's ability to pay the remaining post-incentive costs to purchase and install an efficiency upgrade.

As a new regional water energy nexus program, BayREN's Water Upgrades \$ave facilitates utility investment in behind-the-meter efficiency improvements by providing municipal water utilities with project capital and managing program funding, marketing, customer enrollment, project installation, and customer service while giving utilities the power to decide which customers to target and how much to reduce demand.

Water Upgrades \$ave utility customers install water efficiency improvements with no up-front cost, using a utility-approved on-bill charge that is significantly lower than the estimated savings, so the customer begins saving right away.

New proactive state and local water goals in development through 2027 create an opportunity for additional water/energy savings from customer-side water efficiency projects. Water Upgrades \$ave provides on-water-bill financing mechanism that addresses the traditional barriers to water conservation programs, helps utilities prepare for stricter state conservation goals, and enables water customers to reduce utility costs while improving their premises.

Future opportunities include expanding eligible upgrades and coordinating services with other water and energy efficiency programs.

Evaluation, Measurement, and Verification

Primary EM&V activities in 2020 included the completion of the BayREN 2019 Process Evaluation Report and supporting BayREN as they considered working with CCAs. As part of the process evaluation, the EM&V team worked with all BayREN staff to develop new value metrics (and accompanying logic models) that expressed the value of BayREN programs. Additionally, the EM&V team performed market research to help BayREN understand potential opportunities for future work with CCAs and gave BayREN members ideas for possible useful strategies to engage with the CCAs.



Savings and Expenditures

Energy Savings

In 2020, BayREN administered two resource programs within the Residential Sector that have reported energy savings: The Home+ and BAMBE Programs. The Home+ program is a deemed program utilizing approved Statewide (SW) workpapers for all savings values. The BAMBE program is a hybrid custom and deemed program utilizing EnergyPro Lite (EPL) version 4.0 to model custom project energy savings and deemed values when applicable. Both residential programs reported fuel substitution savings as reported by the Commission-approved Cost Effectiveness Tool (CET). The SMB Commercial Program did not have any completed projects in 2020.

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)
Home+	955,627	8,244,850	59,343	914,076	107
BAMBE	1,315,372	17,596,842	94,410	1,347,848	201
BAMBE Clean Heating Pathway	59,692	883,962	0	0	0
SMB Commercial	0	0	0	0	0
Total Portfolio Savings	2,330,692	26,725,654	153,753	2,261,924	308

Savings by End-Use

TABLE 2: 2020 ANNUAL NET SAVINGS BY END-USE

End-Use Category	kWh	% of Total	kW	% of Total	Therms	% of Total
Appliance or Plug Load	468,017	20%	6	2%	-2	0%
Building Envelope	11,350	1%	27	9%	9,423	6%
HVAC	235,136	10%	63	21%	32,753	21%
Lighting	0	0%	0	0%	0	0%
Service and Domestic Hot Water	241,125	10%	11	4%	17,168	11%
Whole Building	1,375,065	59%	200	65%	94,410	62%
Total Portfolio Savings	2,330,692	100%	308	100%	153,753	100%

Environmental Impacts

Environmental impacts⁴ are shown in Table 3. These results are generated by the 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 3: ENVIRONMENTAL IMPACTS (TONS OF AVOIDED EMISSIONS)

Annual Results	Annual CO2 (tons)	Lifecycle CO2 (tons)	Annual NOx (tons)	Lifecycle NOx (tons)
Total Portfolio	1,617	19,661	671	10,061

Expenditures

TABLE 4: 2020 PROGRAM EXPENDITURES

Program Name	Filing Program Budget	Operating Program Budget	Percent of Portfolio Budget	Program Expenditures
Home+	\$8,861,979	\$8,928,895	39%	\$7,789,068
Green Labeling	\$1,153,500	\$1,133,045	5%	\$1,036,011
BAMBE	\$6,690,000	\$6,697,896	29%	\$5,496,491
SMB Commercial	\$3,409,536	\$3,347,726	15%	\$1,230,030
Codes and Standards	\$1,516,700	\$1,523,802	7%	\$1,469,840
Water Upgrades \$ave	\$1,150,300	\$1,150,651	5%	\$1,084,850
EM&V	\$271,135	\$271,135	1%	\$140,291
Total Portfolio	\$23,053,150	\$23,053,150	100%	\$18,459,724

TABLE 5: 2020 PROGRAM EXPENDITURES BY CATEGORY

Program Name	Admin Costs	Marketing Costs	DINI Costs	Incentives	Total Program Expenditures
Home+	\$511,350	\$1,530,160	\$2,570,880	\$3,176,676	\$7,789,067
Green Labeling	\$21,545	\$119,929	\$576,237	\$318,300	\$1,036,011
BAMBE	\$316,513	\$128,127	\$2,263,809	\$3,001,188	\$5,709,634
SMB Commercial	\$134,432	\$113,784	\$981,815	-	\$1,230,030
Codes and Standards	\$167,982	\$0	\$1,301,858	-	\$1,469,840
Water Upgrades \$ave	\$82,107	\$241,578	\$761,165	-	\$1,084,850
EM&V	-	-	-	-	\$140,291
Total Portfolio	\$1,233,929	\$2,133,578	\$8,455,763	\$6,496,163	\$18,459,724

⁴ Environmental Impacts are Net Annual and Lifecycle Tons of Avoided Emissions.

Cost-Effectiveness

Given BayREN’s directive to focus on filling gaps, piloting different or unique approaches that have the potential to scale and/or targeting hard-to-reach customers, we are not held to a particular cost-effectiveness threshold. This was reaffirmed in D.19-12-021: “Because RENs are designed to fill gaps and serve hard-to-reach customers, and because their portfolios are smaller, their program offerings are likely to be naturally less cost-effective than the larger portfolios of the utilities.”

BayREN has three resource programs and for all, strives to increase cost-effectiveness. However, our piloting of unique activities (consistent with the Commission criteria for the RENs) that cannot be undertaken by other program administrators given cost-effective limitations, can hamper these efforts. Reasons for the decrease in the TRC as well as strategies for increasing the cost effectiveness of these resource programs in 2021 are as outlined below.

Home+

As a result of moving the Home+ Program’s focus towards fuel-substitution measures (the first program administrator to offer this) and the re-forecasted measure mix for 2021, BayREN is realizing a lower than anticipated TRC. This is due to several factors:

- Over time, the aging of the existing measure mix has seen significant reductions in TRC cost benefit calculations. For example, as requirements for duct sealing has become more stringent with Title 24 requiring lower leakage rates year-to-year, programs are forced to increase minimum requirements. This increases the cost of the measure while also lowering the savings, resulting in a lower TRC.
- Fuel substitution measures, while allowed by the new “two-prong test”, are still using TRC calculation methods that do not take into consideration all of the benefits from switching to cleaner and renewable energy sources.
- The Home+ Program maintains a focus towards hard-to-reach and middle-income communities. These communities would face greater difficulty in making energy efficiency improvements to homes were the program to implement increased expectations for efficiency measures to improve TRC. For example, feedback from our Trade Allies has shown that increasing the gas furnace measure efficiency requirement for the Program from >95% AFUE to >98% would increase the cost to the customer by potentially thousands of dollars on an already costly home improvement. This extensive increase in cost, with only a marginal increase in efficiency and TRC, would have the negative result of excluding many of the customers who BayREN seeks to reach.

The introduction of fuel substitution measures into the program has allowed for BayREN to layer incentive funds provided by several CCAs and other funding sources. This experience has proven effective to all parties and is a model for helping to move the market towards increased adoption of electrification measures.

The program offers deemed measures that have a range of cost-effectiveness. The lowest cost measures are offered through the mail-in kits and the direct install Green House Call activities, maximizing the number of homes receiving these energy saving measures.

In 2021, efforts will be focused on promoting these offerings while also marketing home upgrade measures with deeper energy savings which include water heaters and smart thermostats.

BAMBE

Starting in 2020 BayREN launched a decarbonization pathway, which offers additional incentives for multifamily projects with scopes of work that include electrification measures. BayREN will continue to expand this offering into 2021 and beyond. The long-term strategy will be to communicate marketability and non-energy benefits to participants so as to build market awareness around energy efficiency and electrification as we prepare to transition away from rebates.

SMB Commercial

In 2021, the Program will continue to keep its eye on cost-effectiveness. The pay-for-performance nature of the incentive structure and the rigorous measurement and verification processes that ensue equipment installation already ensure that ratepayer funds are not paying for non-existent savings. The pandemic has made many SMBs concentrate on core competencies, rather than upgrades. As a result, should data and trends continue to indicate a dramatic economic down-turn in the SMB sector, sustaining high levels of incentives – paying a premium for energy efficiency – may be required. At the same time, with an eye on cost-effectiveness, the Program will continue to implement a stepped, metered approach to increasing incentives in 2021.

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 7 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 7 are the sum of total program administrative and incentive costs.

TABLE 6: 2020 COST-EFFECTIVENESS

Program	TRC Ratio	PAC Ratio
Home+	0.12	0.16
BAMBE	0.21	0.43
BAMBE Clean Heating Pathway	0.10	0.12
SMB Commercial	NA	NA
Portfolio	0.13	0.19



Metrics

Metrics

BayREN Value Metrics

As submitted in BayREN's 2021 Annual Budget Advice Letter, BayREN proposed Value Metrics in 2020 to better track the unique value BayREN provides to the region and to the state. BayREN established its Value Metrics as indicators (that is, values without specific targets) for the first reporting year 2021. Whether or not BayREN would select targets for future years will be revisited after the first year of collecting data, that is, once a baseline is established. Values for these indicators will be reported in BayREN's 2021 Annual Report.

D.12-11-015 provided the criteria upon which REN programs are evaluated.⁵ As a regional energy network, BayREN also helps to make state policy objectives (i.e., reducing GHG emissions and increasing energy savings) practical at the local level by conducting three overarching services (also referred to as BayREN's value pillars):

1. BayREN builds human and organizational infrastructure⁶ within local jurisdictions so that Bay Area communities are better able to save energy and reduce greenhouse gas emissions.
 - BayREN is suited to serve in this capacity because of the member's connections to local jurisdictions and their understanding of what is needed by local governments and their communities. In 2020, the BayREN portfolio established tracking for:
 - local contractors with program experience/proficient with decarb measures.
 - LG staff trained on energy codes/best processes with code compliances.
 - jurisdictions served.
 - local realtors and appraisers who received green certifications.
 - lenders trained on EE lending options.

⁵ The criteria are: 1. Activities that utilities cannot or do not intend to undertake; 2. Pilot activities where there is no current utility program offering, and where there is potential for scalability to a broader geographic reach, if successful; and 3. Pilot activities in hard to reach markets, whether or not there is a current utility program that may overlap. Note this criterion was reiterated in D.19-12-021 and expanded the utility programs to also include CCA programs.

⁶ The CPUC uses the term capacity building, which is similar to "building human and organizational infrastructure." BayREN uses this alternative term since we have been unable to identify a specific CPUC definition for capacity building, and therefore are unable to identify whether or not these activities align. Note that the utilities have conducted some capacity building activities in prior years under their local government partnerships, but these activities are currently limited (and are constrained by IOU directives).

2. BayREN obtains energy savings locally while also supporting local difficult to serve populations.⁷
 - Local governments have a deep understanding of the needs of their communities. Based on the member's (i.e., local government's) assessment of the needs in their communities, they have identified populations that are in need of additional support and they are designing program activities to better target these populations.
 - kwh/therm saved within SMB/HTR/DAC.
 - kwh/therm saved within LDTs MF.
 - kwh/therm saved within LDTs SF.
3. BayREN tests innovative solutions that have the potential to help local jurisdictions increase energy savings and reduce greenhouse gas emissions.
 - The innovative solutions tested by BayREN have bubbled up from discussions with local governments and thus represent local needs. These innovative solutions are wholly designed and implemented by the BayREN members, which are themselves local governments, to fill gaps that the members (local governments) feel exist.
 - Single Family Homes received fuel substitution measures resulting in XX therms saved.
 - MF units received fuel substitution measures resulting in XX kWh saved.

In 2020 as part of the Annual Budget Advice Letter, BayREN submitted value metrics and measurements within these three value pillars that demonstrate BayREN's impacts helping reduce GHG emissions and increase energy savings. These metrics are focused measurements, intended to detail the value that BayREN provides to the State. 2021 will be the first year that BayREN reports on these metrics.

D.18.05.041 Metrics

2020 BayREN metrics are provided in the Annual Report Excel Template. 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:

Home+:

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

⁷ The term "underserved" is similar in nature to the phrase "local difficult to serve populations" used in this document. The CPUC is considering defining the term "underserved," and the ultimate definition may or may not align with the populations that are difficult to serve in BayREN's region. As such, BayREN uses an alternative term, local difficult to serve, to specifically define Bay Area populations that have been defined as underserved by the Bay Area local government members.

BAMBE:

- 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.”

PG&E does not have a process for collecting total number of eligible multifamily properties, therefore BAMBE used CoStar data to determine the eligible population by property. All other data are derived from BAMBE’s internal tracking database(s) and outputs from the 2020 Annual Claims submission submitted on California Energy Data and Reporting System (CEDARS).

Commercial Sector

The SMB Commercial Program was approved in May of 2018 and had significant delays in 2019 due primarily to contracting and 2020 due to COVID-19. The Program will launch in 2021. Thus, there are no metrics to report for 2020.

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. BayREN, together with the Tri-County Regional Energy Network (3C-REN), proposed new and modified metrics and indicators for Codes and Standards in the September 2020 ABAL, as allowed by D.18-05-041. These revised metrics are in the Annual Report Excel Template and are detailed below.

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.
- Bay Area jurisdictions that adopted one or more reach codes for the 2019 code cycle.

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 2020, there were:

- Number of organizations with staff participating in an Energy Policy Forum.
- Percent of jurisdictions with staff participating in an Energy Policy Forum.
- Total number of attendees participating in an Energy Policy Forum.

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.)

- Number of organizations directly engaged in Codes & Standards activities.
- Percent of jurisdictions engaged in Codes & Standards activities.

Buildings Receiving Enhanced Compliance Support

Several BayREN Codes activities support code compliance for individual buildings.

- Buildings in the Bay Area receiving enhanced compliance support.

Increase in Closed Permits

BayREN in collaboration with 3CREN proposed to remove this metric in the 2020 ABAL Filing(s). This is due in-part to the difficulty of obtaining and tracking permit data across hundreds of jurisdictions. In 2019, the program 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.

Appendix A: BayREN Programs for 2020⁸

CEDARS ID	Program Name	Date Added	Date Removed
BayREN02	Multifamily Building Enhancements Program	1/1/2013	
BAYREN02-A	Multifamily Building Enhancements Program – Clean Heating Pathway	1/1/2020	
BayREN03	Codes and Standards Program	1/1/2013	
BayREN04	Water Upgrades \$ave	1/1/2013	
BayREN05-A	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

⁸ In 2019, BayREN updated program offerings to align with BayREN’s Business Plan.