



SEEC Virtual Forum: Webinar 10

September 1, 2020 | 1:00 PM – 2:15 PM PST

Building Decarbonization Full Throttle: CPUC Updates and Regional Implementation



BAY AREA AIR QUALITY
MANAGEMENT DISTRICT



Thank you to...

Our sponsors for making this series possible!



*Pacific Gas and
Electric Company*[®]



SOUTHERN CALIFORNIA
EDISON[®]

Energy for What's Ahead[™]



Southern
California
Gas Company

BAYREN

Southern California
REGIONAL ENERGY NETWORK



Our promotional partners for extending our reach!



Clean ⚡
Coalition



EMPOWER
INNOVATION



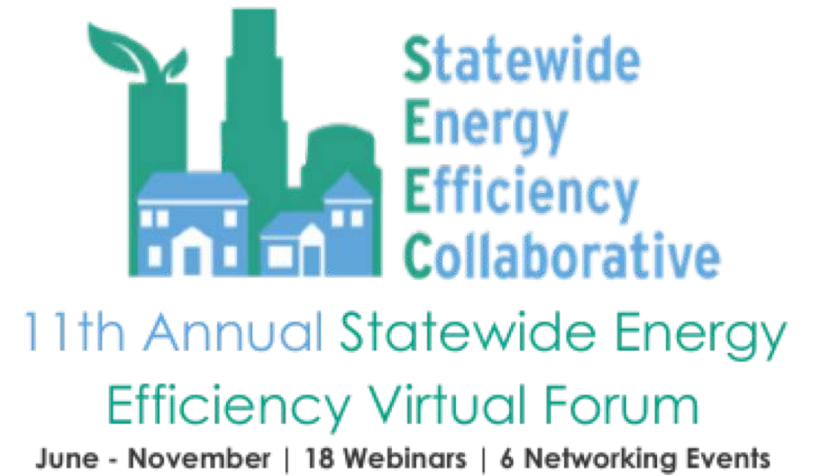
SAN DIEGO
GREEN
BUILDING
COUNCIL



USGBC
CENTRAL
CALIFORNIA

Upcoming Events

Learn more and register at:
californiaseec.org/2020-forum/



9/9 – Webinar 11 Not Your Grandma's Regulatory Update

9/17 – Webinar 12 State-Administered, Utility-Supported Financing for Energy Efficiency Retrofits

9/22 – Networking Activity 4 Bingo Night!

9/29 – Webinar 13 Local Governments Leading the Way through Resilient Microgrids

10/7 – Webinar 14 Strategic Planning for a Clean Energy Future: How to Phase, Scale & Finance Smart Cities Solutions

10/15 – Webinar 15 Keeping the Focus Local: A Conversation with SoCalREN Regional Partnerships



Join the SEEC Peer-to-Peer Network on LinkedIn!



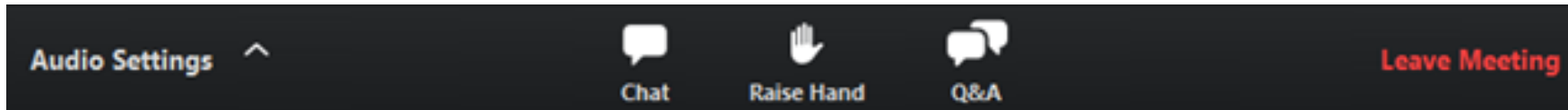
Use this group to connect with other professionals, whether it be for project support or professional development reasons!

Find us at <https://www.linkedin.com/groups/8956010/>



Q&A

- Submit questions for panelists through the Q&A module at any point during the webinar.
- Upvote questions that you are interested in hearing responses to.



Chat

- Engage in a dialogue with your peers – share resources, case studies, and best practices
- Reach out to LGC staff if you encounter technical issues or have questions about the SEEC Forum.



Introducing Today's Panelists



Jennifer West
Program Manager
StopWaste



Jennifer Berg
Energy Programs
Manager
*Association of Bay
Area Governments*



Rory Cox
Senior Analyst
Energy
Division/CPUC



Abby Young
Climate Protection
Manager
*Bay Area Air Quality
Management District*



Building Decarbonization Full Throttle – CPUC Programs

Statewide Energy Efficiency Collaborative – Webinar 10

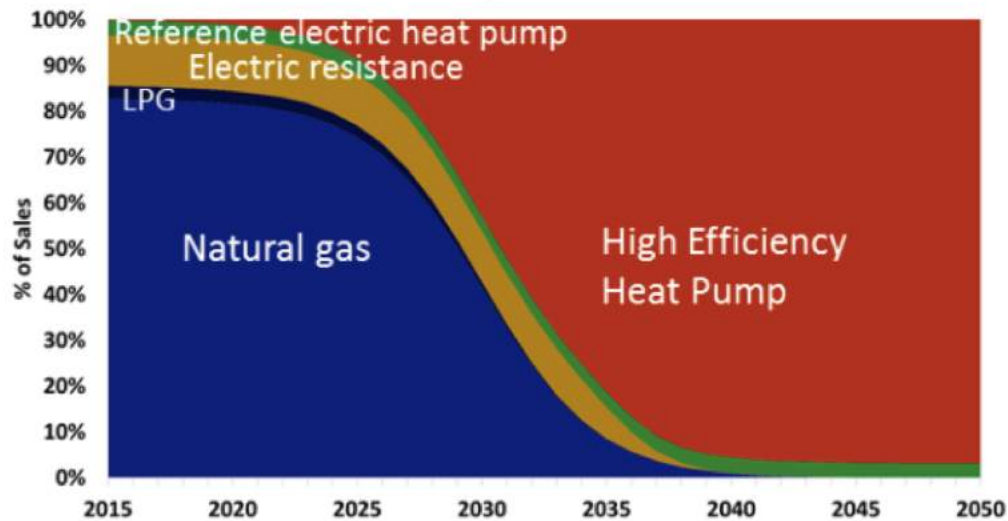
September 1, 2020

Rory Cox, Analyst, CPUC

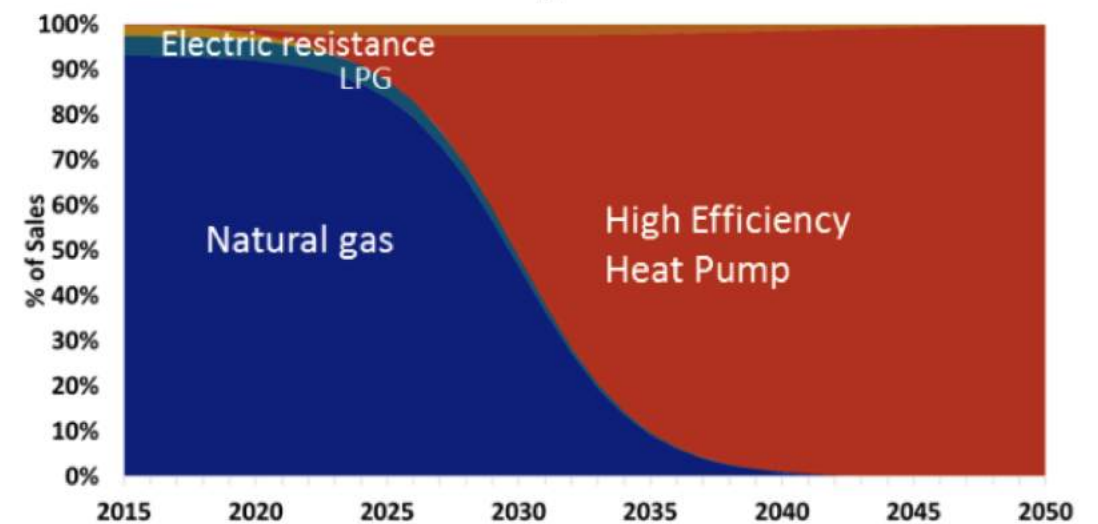


Transforming the Market for Space and Water Heating

Space Heating (Residential, similar for Commercial)
% of new sales in High Electrification Case



Water Heating (Residential, similar for Commercial)
% of new sales in High Electrification Case



Source: E3



CPUC Programs Incentivizing Heat Pumps

- Building Decarbonization/SB 1477 - \$200 million
- Self Generation Incentive Program - \$44 million
- Low Income/DACA - \$136 million
- Energy Efficiency - \$TBD

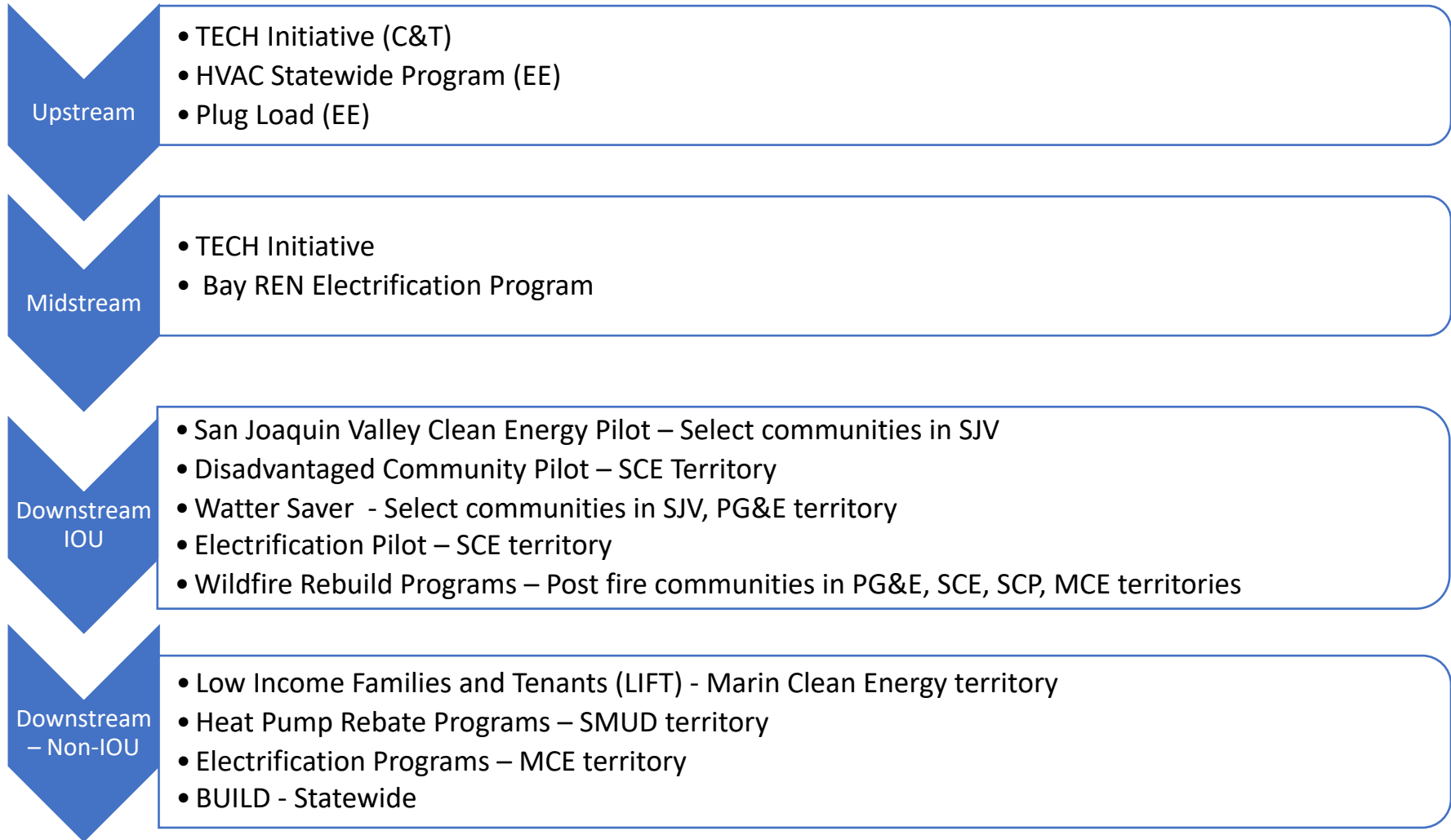
Total - \$380 million +

(Numbers are approximations)





Incentivizing all Parts of the Supply Chain



(Not a comprehensive list)



SB 1477 Programs



BUILD

- 75 percent of BUILD funding must go to low-income, residential housing.
- Requires Technical Assistance and no increase in utility bills
- Requires an outreach plan



TECH

- Low-emission space and water heating technologies
- Early stage of market development
- Greatest potential for reducing GHGs
- Energy affordability for low income households



Common Issues for BUILD and TECH

Budget and Evaluation

- 40% of funding (\$80 million) will go to BUILD and 60% will go TECH (\$120 million) over four years
- Administrative costs are capped at 10 percent for both programs.
- One evaluation contract for both programs.
- Evaluation should provide on-going, real-time data collection.





Common Issues for BUILD and TECH

Required Metrics

- Cost per metric ton of avoided GHG emissions
- Projected Bill Savings
- Number of low emissions systems installed
- Market Share for eligible technologies (TECH Only)
- Evaluator should also calculate participant bill savings.

Other “sub-metrics” listed in Decision, to be determined by implementer and Evaluator



Common Issues for BUILD and TECH



Marketing, Education, and Outreach

- Implementers will work with supply chain actors, community-based organizations to provide ME&O for low income and disadvantaged community customers
- ME&O metrics:
 - Customer awareness and knowledge
 - Solutions to perceived barriers
 - Demonstration of customer and market transformation behavior



Common Issues for BUILD and TECH

Global Warming Potential (GWP) of Common Refrigerants

Low GWP

Mid GWP

High GWP

Refrigerant	100-yr GWP	Uses
R-717 (Ammonia)	0	Industrial Heat pump for non-residential buildings
R-600a (Iso-Butane)	0	Industrial heat pump technology replacement for R-22
R-600 (N-Butane)	0	Industrial heat pump technology
R-744 (CO2)	1	Currently used for water heat pumps around the world and marketed in the US, cost issue
R-290 (Propane)	4	Used widely in Europe
R-1234yf and R-1234ez	4	Residential heat pumps for water heaters
R-447A (HFO L-41)	583	Replacement for R-410a in residential heat pumps
R-454B (HFO DR-5A)	466	Replacement for R-410a in residential heat pumps
R-32	675	Drop in replacement for R-410a in residential heat pumps
DR-55 HFO	698	Mini Split Air Conditioner replacement for R-410a
R-466A	733	Non-flammable replacement for wide use in heat pumps
R-134a	1430	Current wide use in heat pumps
R-22	1810	Current wide use in air conditioners
R-410a	2088	Current wide use in heat pumps

Programs that utilize appliances with Low GWP to receive kicker incentives

Programs that utilize appliances with medium or high GWP may receive incentives until 2023

In 2023, incentives phase out for High GWP refrigerants.



BUILD Program



Low Income Focus

- Administered by CEC
- Will be 100% low income/DACA residential new construction
- Funds unspent after two years of end of program may be repurposed
- CEC shall develop a tool to estimate program-driven bill savings
- Incentives for either sub-division or single family home



BUILD Program



All-Electric Focus

- Buildings must be built...
 - A) All electric, no gas-line extensions
 - B) Show modeled GHG savings above standards of equivalent mixed-fuel building
- May incentivize any combination of measures, including energy efficiency, demand response, electric batteries, or beyond-code solar.
- CEC has flexibility to adjust incentive level based on participation rates, market activity, costs, complementary programs



TECH Initiative



Three Premises

- Consumer education, training, mid- and upstream incentives
- CPUC should identify and target heating equipment at an early stage of market development.
- CPUC should develop
 - Guidelines and evaluation metrics
 - Implement outreach strategies for hard-to-reach customers
 - Provide for job training and employment opportunities.



TECH Initiative



Third Party Implementer

- CPUC, in coordination with CEC, should identify and target heating equipment at an early stage of market development
- CPUC will oversee competitive solicitation for the TECH implementer
- SCE will be contracting agent, with input from CEC



Questions?



Image: <https://www.thefctre.com/en/>

Rory Cox
415-703-1093
rory.cox@cpuc.ca.gov



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

BAAQMD's Building Decarbonization Strategy

SEEC: Building Decarbonization Full Throttle: CPUC Updates and Regional Implementation

September 1, 2020

**Abby Young
Climate Protection Manager**

Bay Area Air Quality Management District

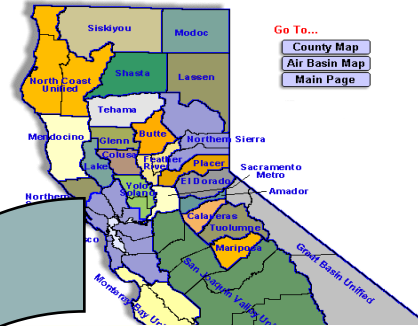


The Bay Area Air Quality Management District (BAAQMD) is the San Francisco Bay Area's air pollution control agency.

BAAQMD's jurisdiction includes 9 counties; 101 cities; and a population of more than 7 million people.

Mission statement: BAAQMD aims to create a healthy breathing environment for every Bay Area resident while protecting and improving public health, air quality, and the global climate.

California Air Districts

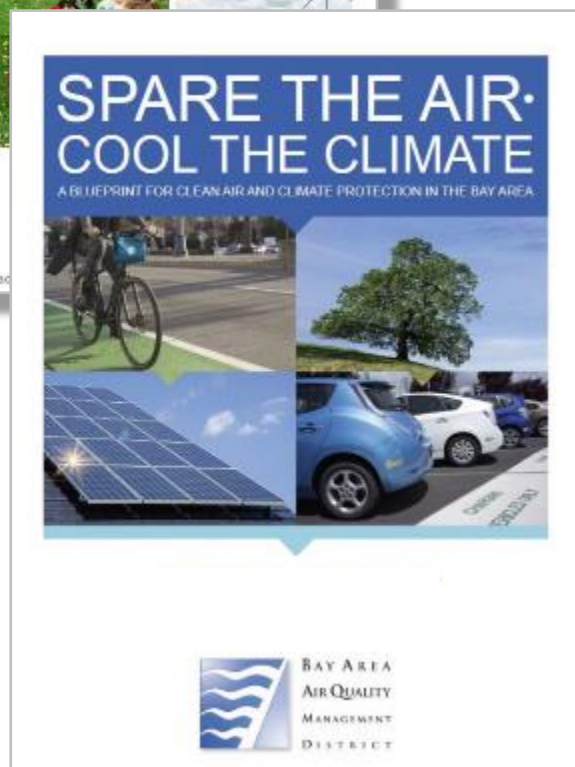
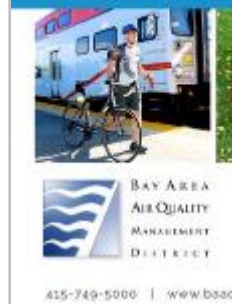


BAAQMD's Clean Air Plan



A comprehensive strategy of 85 measures across 9 sectors

Goal: GHG emissions reductions of **80% by 2050** (below 1990 levels)



Stationary (Industrial) Sources

Transportation

Energy

Buildings

Agriculture

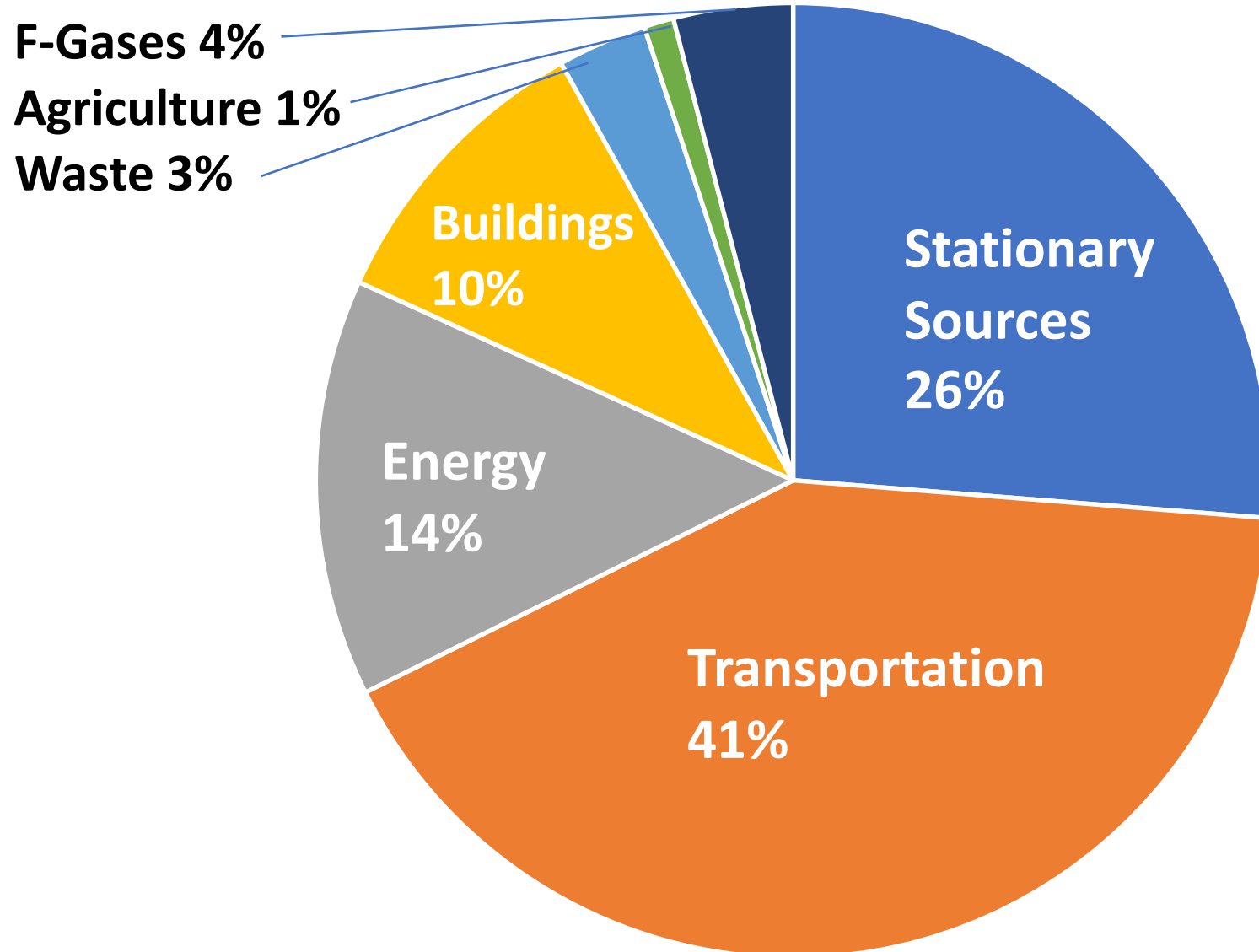
Natural & Working Lands

Waste Management

Water

Super-GHG Pollutants

2015 Bay Area GHG Emissions by Source

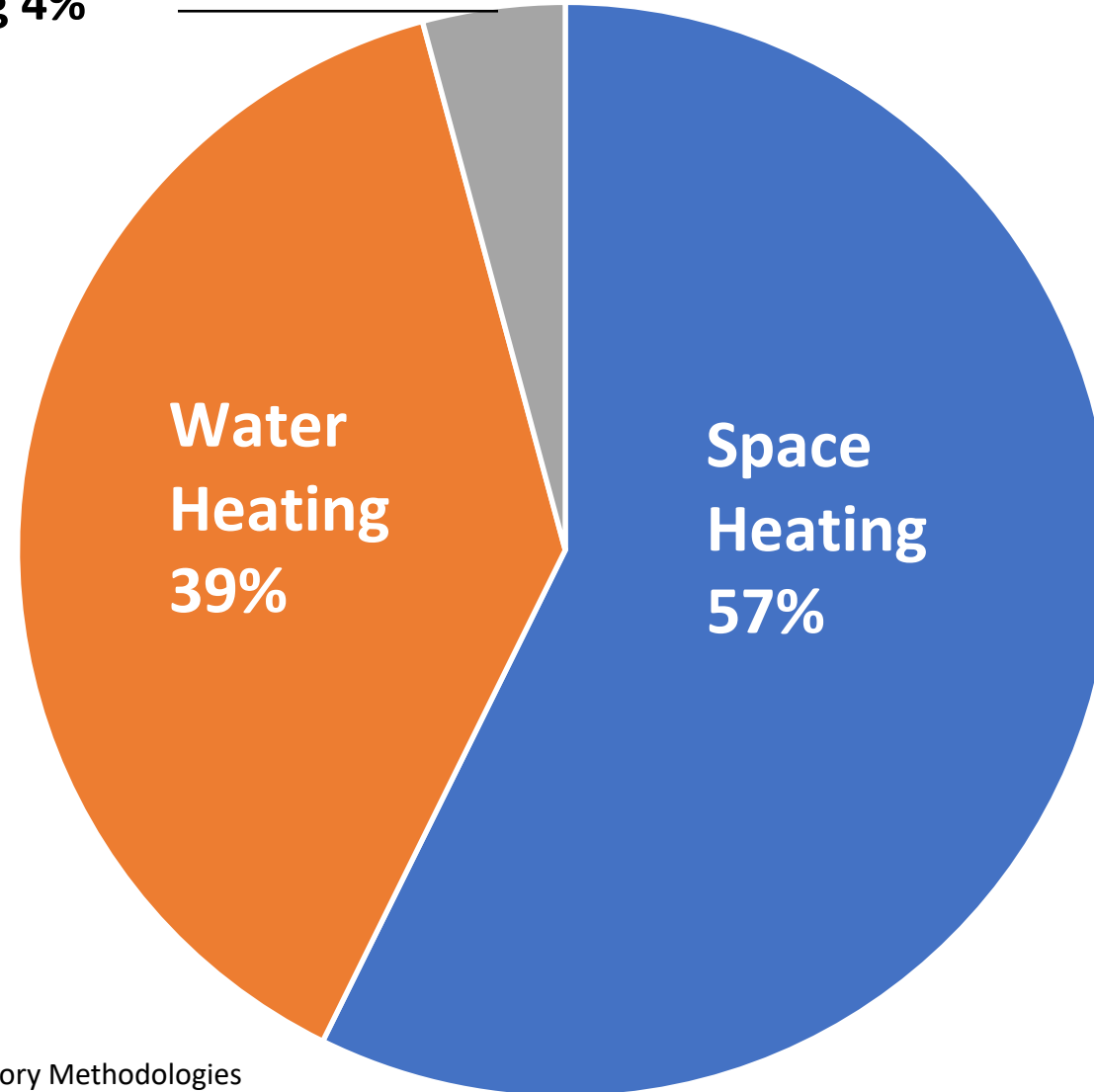


*Based on 100-year Global Warming Potential
(Total = 85 MMT CO₂e)*

2015 Bay Area Residential Natural Gas Usage by Category



Cooking 4%



Building Decarbonization Elements

Energy Efficiency

Electrification

Load Management



BAAQMD Building Decarbonization Strategy



LOCAL GOVERNMENT SUPPORT

Develop resources to help local governments implement a suite of building decarbonization strategies.

RULEMAKING

Explore new rules for appliances in residential and commercial buildings.

COORDINATION

Strengthen collaborations with the Building Decarbonization Coalition, BayREN, and other regional partners.

INCENTIVES

Fund pilot heat pump water heater incentive programs, and support scaling by local governments.

Rule-making Challenges



Limits to authority

Impacts on equity

Impacts on workforce,
other stakeholders



Local Government Support



Clean Building Compass



RESOURCES BY CONSTRUCTION PHASE



www.buildingdecarb.org/compass

Climate Protection Grant Program



The **2018 Climate Protection Grant Program** awarded \$4.5 million to 17 projects across Bay Area local governments, in two program areas:

- reducing GHGs from **existing buildings**, and
- fostering **innovative strategies** for long-term GHG reduction.



Heat Pump Water Heater Incentive Programs

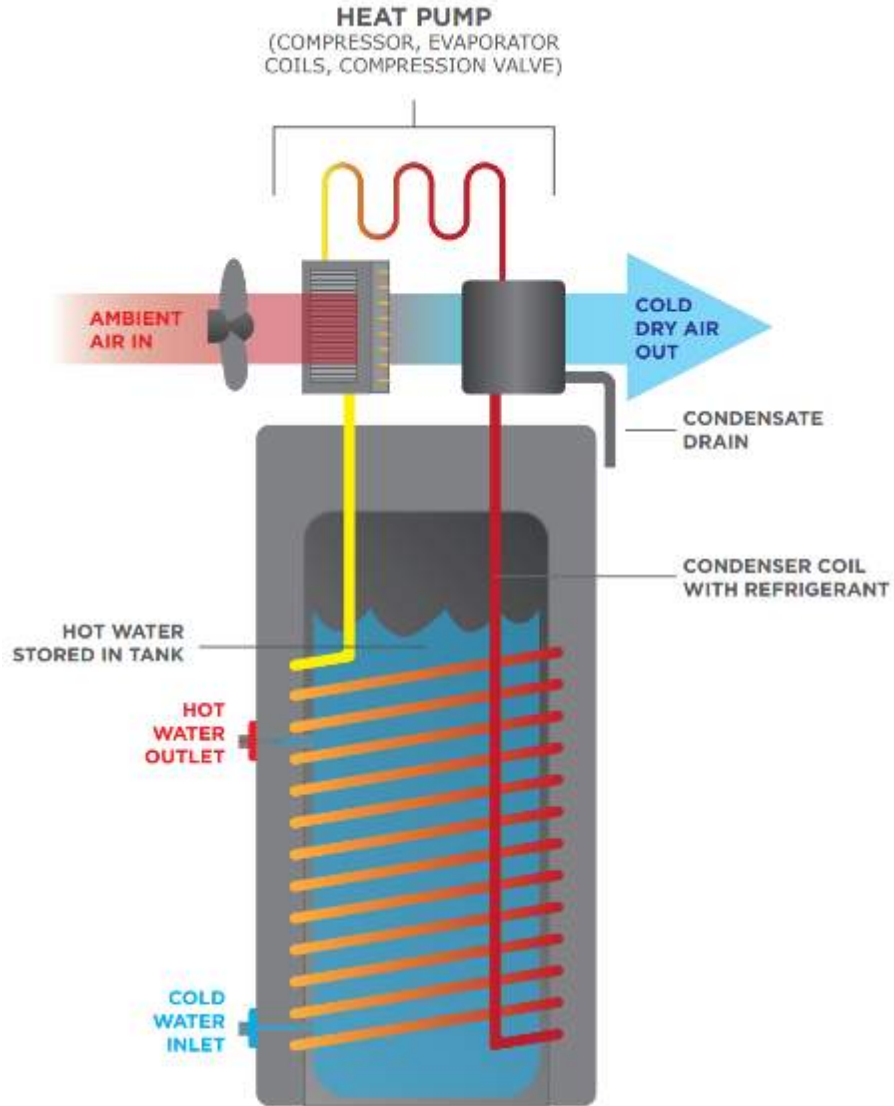


Image: Silicon Valley Clean Energy HPWH Buyers Guide



Contra Costa Green and Healthy Homes Initiative



Contra Costa County's Green and Healthy Homes Initiative pilot program will integrate various climate and health interventions to improve outcomes for low-income high-risk asthma patients across the county.

The Project Team and Partners includes:



Contra Costa Green and Healthy Homes Initiative



The County with its partners will implement and monitor improvements in the homes of select high-risk asthma patients (adults and children) across Contra Costa County to:

- improve indoor air quality,
- remove underlying asthma triggers, and
- reduce GHG emissions.

The Air District will also work with the County to align project implementation with the goals of the AB 617 Path to Clean Air effort in Richmond-North Richmond-San Pablo.



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

Thank You

Abby Young
Climate Protection Manager
ayoung@baaqmd.gov



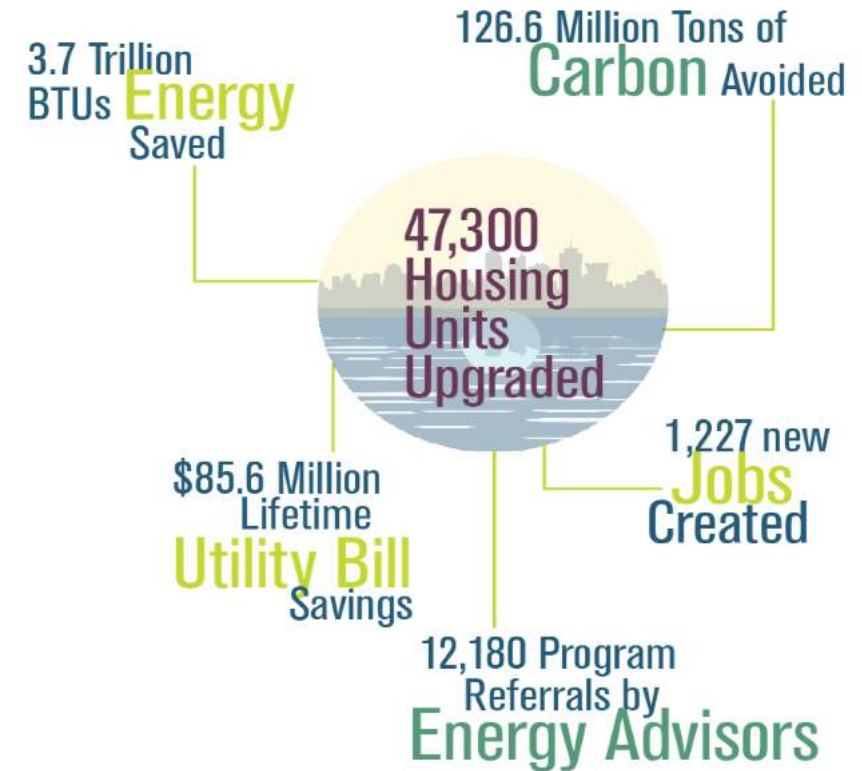
Local Governments Empowering Our Communities

BayREN is Electrifying the Bay Area!

SEEC Forum
September 1, 2020

Who We Are

- The Bay Area Regional Energy Network (BayREN) is a collaboration of the 9 counties that make up the San Francisco Bay Area.
- Led by the Association of Bay Area Governments, BayREN 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 climate, resource, and sustainability programs.



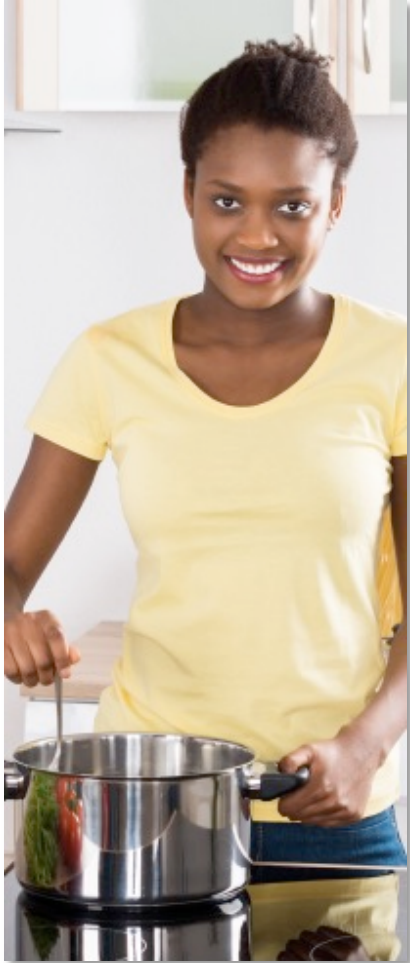


BayREN's Vision

- RENs are a critical part of the solution for the State's **reliable and sustainable energy future** that considers water, greenhouse gases, and resiliency.
- By uniting and coordinating multiple efforts at a regional level and delivering these integrated solutions, **the RENs will help the State meet our aggressive goals** related to climate change
- New portfolio focus on **building electrification**

Single Family – Home+

Single Family Messaging



- Leveraging other efforts
 - ✓ Contractors/Mid-stream HPWH program
 - ✓ CCA programs
 - ✓ Building Decarbonization Campaign
 - ✓ Electrification Expo Attendees
- Health and Safety
- Grid interactivity

Single Family Measures



Measure	Rebate Amount
Heat Pump Water Heater	\$1,000
Heat Pump HVAC (pre-existing heating/cooling equipment)	\$1,000
Heat Pump Clothes Dryer	\$300
Induction Cooktop/Range	\$300

Green Labeling

Green Labeling Overview



- U.S. DOE Home Energy Score (HES) is an energy efficiency metric
- Electrification as EE should be reflected in score (more efficient than gas)
- Work with DOE and other cities on how to accurately represent this in scoring algorithm

Green Labeling Overview

- Assessors can recommend replacing gas appliance with electric
 - Uncommon, working to encourage and support Assessors
- Assessors will look at stoves and dryers
 - Not currently part of assessment
 - Update database to include this information
 - Include in custom recommendations

Energy Improvements, customized for your home.

FEATURE	TODAY'S CONDITION	RECOMMENDED IMPROVEMENTS
Attic Insulation	Insulated to R 11	At least 15% leakage reduction from vintage table defaults
Floor Insulation	Insulated to R 00 Insulated to R 00	Insulate \geq R 19
Wall Insulation	Insulated to R 00	Insulate \geq R 13
Heating Equipment	Central gas furnace 70% AFUE Central gas furnace from 2016	Central gas furnace \geq 95% AFUE
Duct Repair	Ducts not sealed or insulated Ducts sealed and insulated	Seal and insulate ducts \geq R 8
Water Heater	Gas storage 55% EF	Gas on demand (tankless) \geq 0.82 EF

Bay Area Multifamily Building Enhancements (BAMBE)

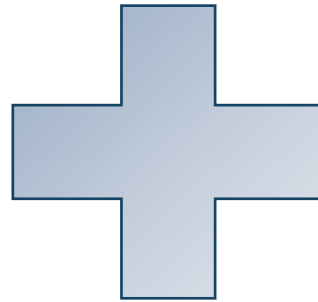
Multifamily Decarb Clean Heating Pathway

Core Program

- No-cost energy consulting
- Cash rebates of \$750/unit
- Referrals to other programs

Eligible Upgrades

- HVAC
- Domestic hot water
- Envelope (windows, insulation)
- Lighting
- Appliances
- Pool equipment



Clean Heating Pathway

- Incentive adders for gas-to-electric upgrades
- Zero Net Carbon (ZNC) plan
- CO₂ emissions reduction requirement (customer facing)
- Heat pump readiness can be counted as a measure (restrictions apply)

Multifamily Decarb Messaging



Participants

- Communicating the benefits of electrification
 - Indoor air quality & health
 - Efficiency
 - GHG emissions reductions
- Providing education

Partners

- Coordinating incentive layering
- Reporting back on contractor learning opportunities
- Reporting back on technology issues

Codes & Standards

Codes & Standards Decarbonization Activities

- BayREN's C+S Program provides training for local building departments on a variety of topics to improve compliance with the Energy Code
- Two new trainings are also designed to support decarbonization:
 - ✓ Heat Pump Water Heater Training
 - ✓ Reach Code Implementation Training

Codes & Standards HPWH Training

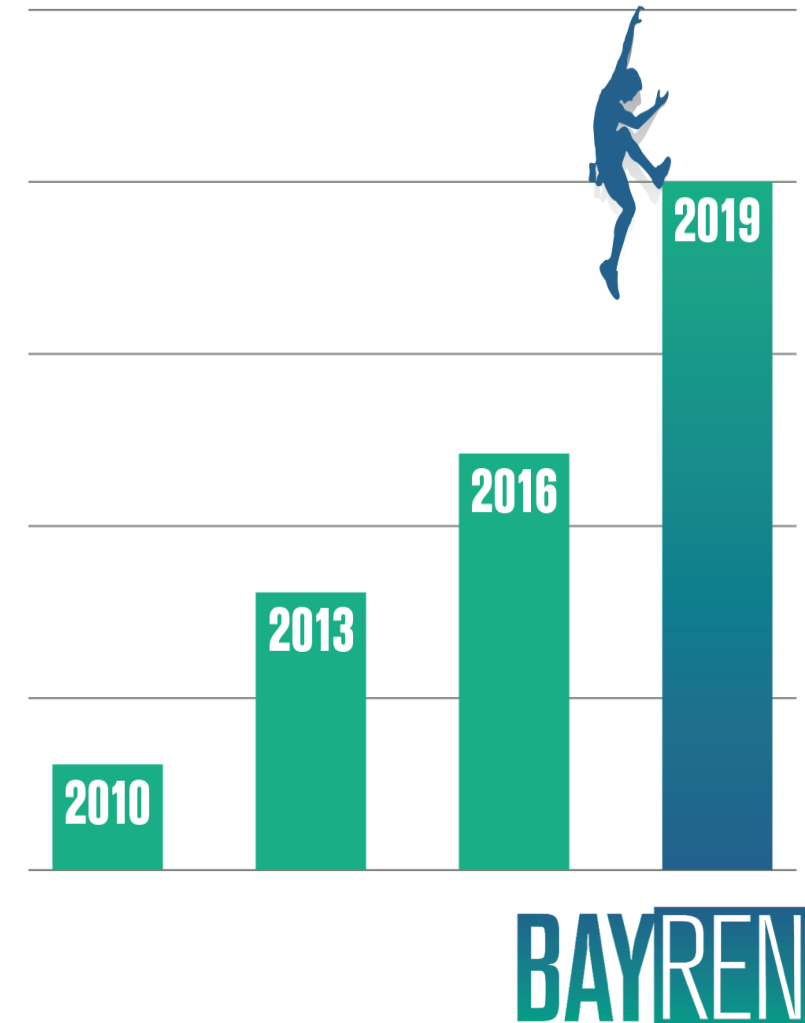


Photo credit: A. O. Smith

- Trains local plans examiners and building inspectors on fundamentals of HPWHs and 2019 Energy Code Requirements
- Supports **regional and local** HPWH rebate/incentive programs
- Has been provided 19 times in the Bay Area, for both single jurisdictions and groups

Codes & Standards Reach Code Training

- Developed in response to analysis that found reach code compliance levels lower than expected
- Provides local governments with training both to understand an adopted reach code and to implement it effectively
- Developed in conjunction with PCE/SVCE, allowing inclusion of EV and PV components



BayREN Regional Contractor Heat Pump Water Heater Incentive Program

Jennifer West, StopWaste

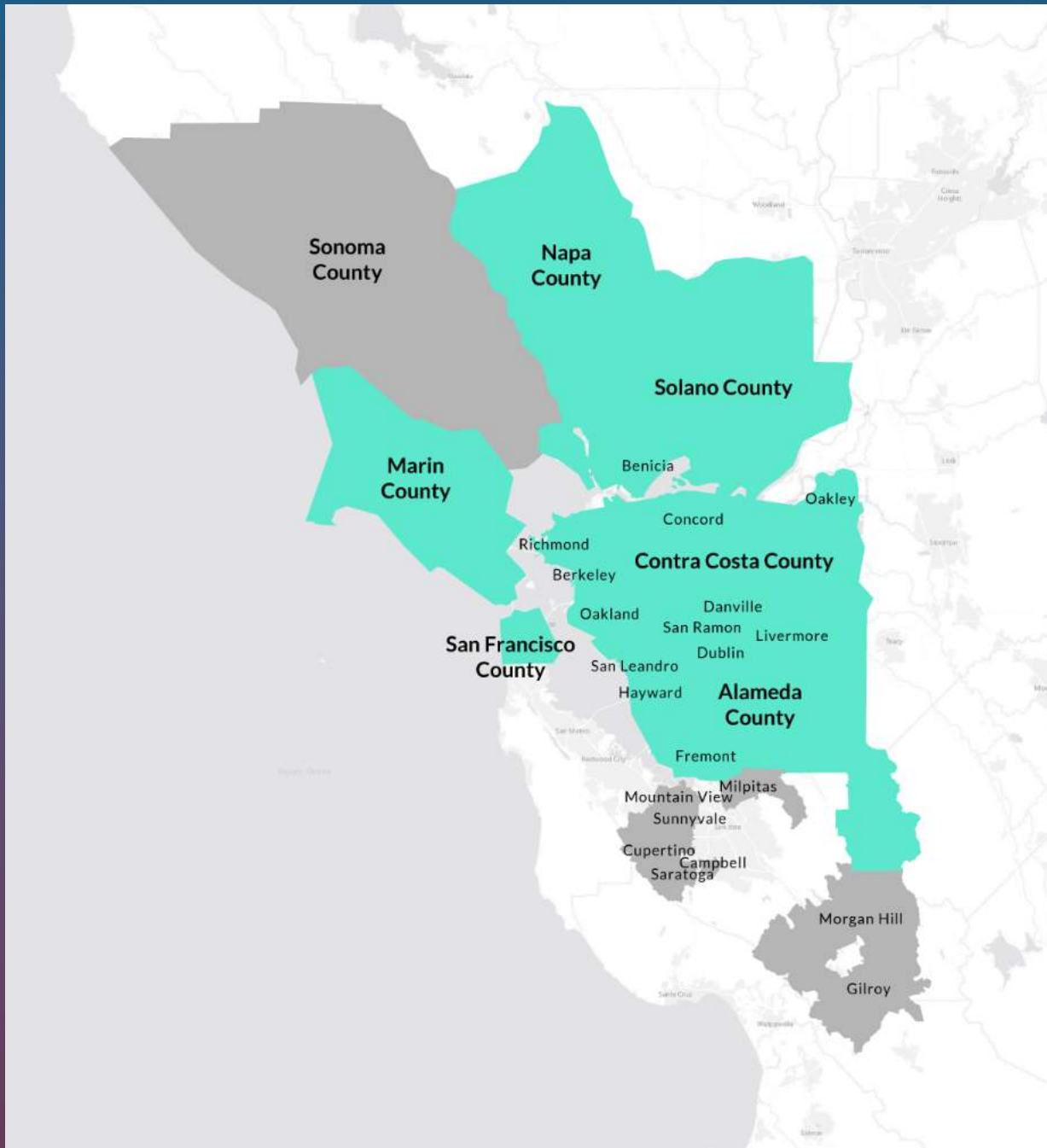
jwest@stopwaste.org
(510) 891-6555

bayren.org/hpwh



Regional HPWH Program will cover six counties as of **October 2020**

- EBCE (Alameda)
- MCE (Marin, Napa, Solano & Contra Costa)
- CleanPowerSF



Regional HPWH Program Details

Program Administrator	BayREN / StopWaste / Energy Solutions
Eligible Contractors	Contractors with C-20, C-36 or General Contractors
Equipment Requirements	High-efficiency and grid-capable (QPL on website)
Equipment Incentives	\$1,000 per HPWH
Site Requirements	<ul style="list-style-type: none">• No new construction• Switching from gas/propane water heater• In single-family or multifamily unit
Demand Response	Equipment is required to be grid-capable
Documentation	Simple Pre- and Post-Installation Documentation



Bay Area: 8 Incentive Programs for HPWH

List available on BayREN website with links

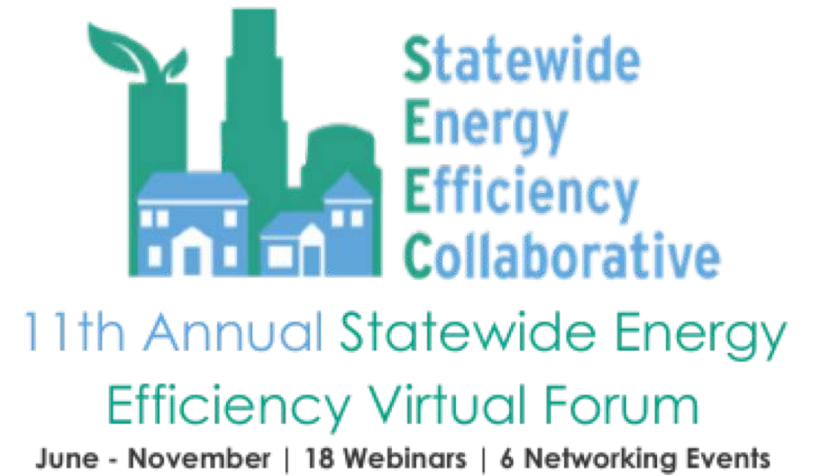
- Home + (\$1,000)
- Contractor HPWH Incentive (\$1,000)
- SVCE, San Jose, Electrify Marin, Sonoma Clean Power
- Palo Alto, City of Alameda
- Summary: \$700 - \$7,000

Questions for the panel

- From the moderator
- From attendees – please put your questions in the Q&A anytime

Upcoming Events

Learn more and register at:
californiaseec.org/2020-forum/



9/9 – Webinar 11 Not Your Grandma's Regulatory Update

9/17 – Webinar 12 State-Administered, Utility-Supported Financing for Energy Efficiency Retrofits

9/22 – Networking Activity 4 Bingo Night!

9/29 – Webinar 13 Local Governments Leading the Way through Resilient Microgrids

10/7 – Webinar 14 Strategic Planning for a Clean Energy Future: How to Phase, Scale & Finance Smart Cities Solutions

10/15 – Webinar 15 Keeping the Focus Local: A Conversation with SoCalREN Regional Partnerships



Thank you to...

Our sponsors for making this series possible!



*Pacific Gas and
Electric Company®*



SOUTHERN CALIFORNIA
EDISON®

Energy for What's Ahead™



Southern
California
Gas Company

BAYREN

Southern California
REGIONAL ENERGY NETWORK



Our promotional partners for extending our reach!



Clean ⚡
Coalition



EMPOWER
INNOVATION



SAN DIEGO
GREEN
BUILDING
COUNCIL



USGBC
CENTRAL
CALIFORNIA