



BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT

**AGENDA: 3A**

# **Update on Heat Pump Water Heater Grants**

**Climate Protection Committee Meeting  
June 18, 2020**

**Axum Teferra  
Environmental Planner II**

# Background



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

- reducing greenhouse gasses (GHG) from existing buildings; and
- fostering innovative strategies for long-term GHG reduction.



# Today's Presenters

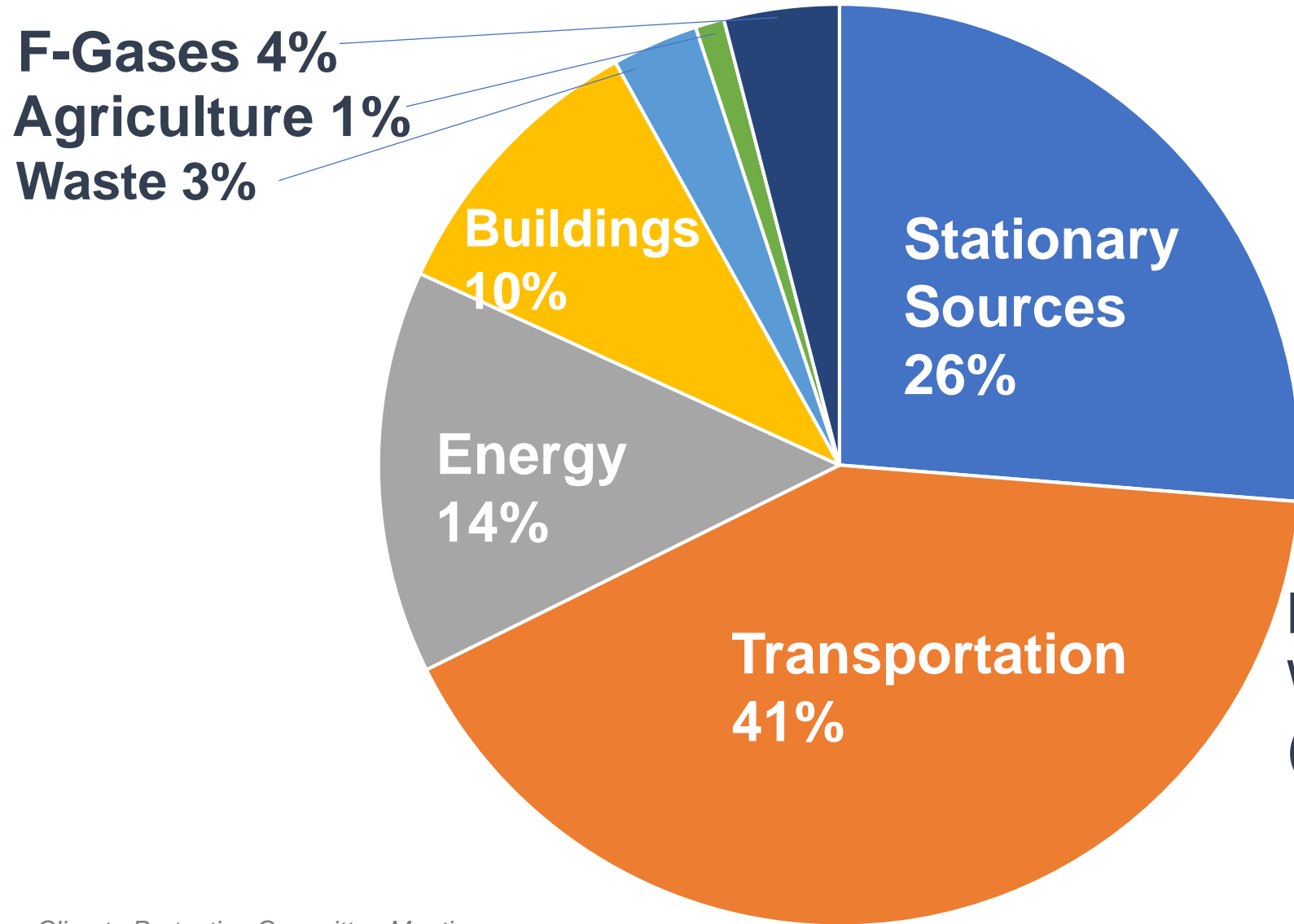


**Jennifer West**, Program Manager at StopWaste, and Lead of the Heat Pump Water Heater (HPWH) Contractor Incentive Program for Bay Area Regional Energy Network (BayREN)

**John Supp**, Account Services Manager  
Silicon Valley Clean Energy (SVCE)

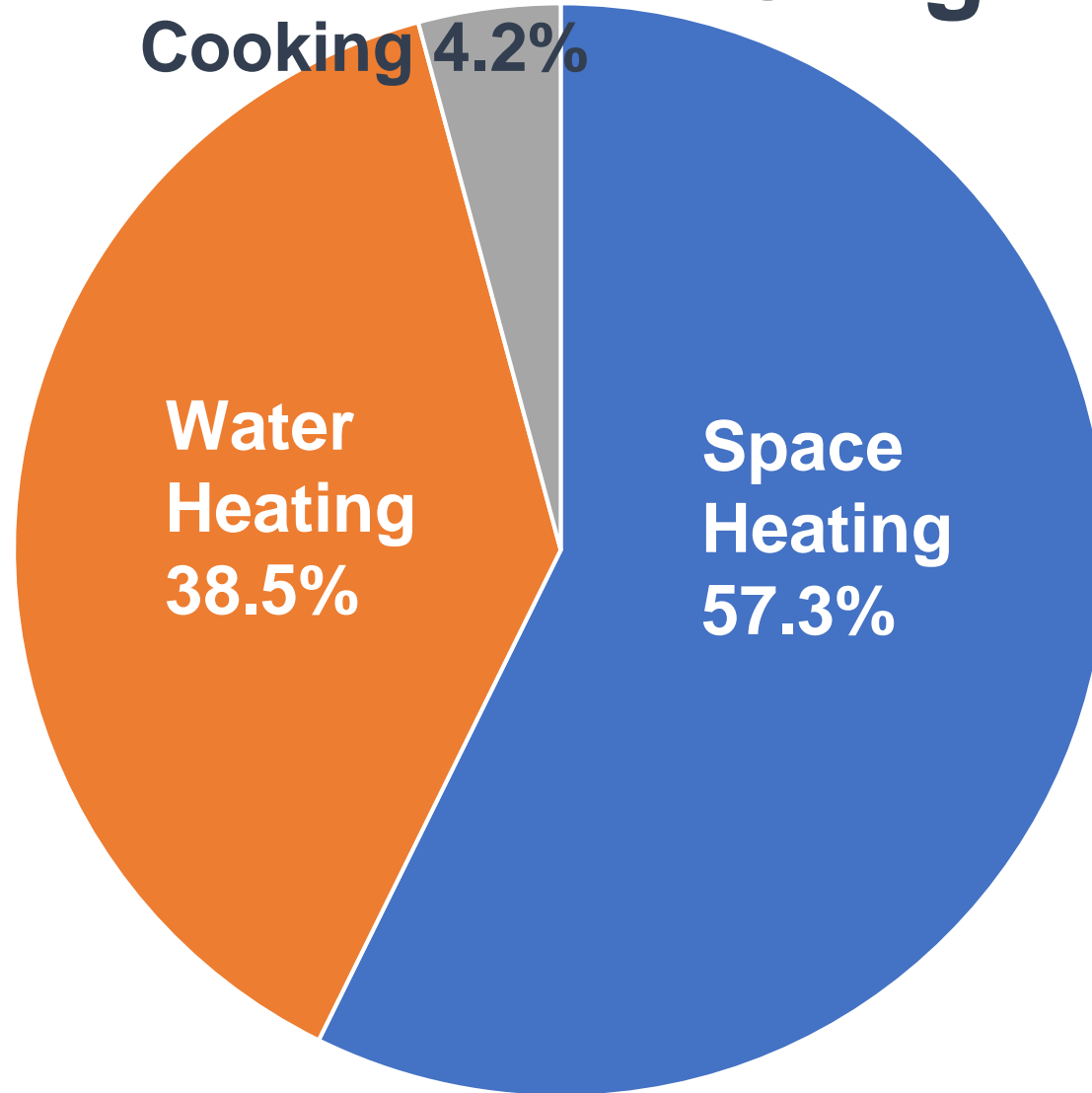
**Leanna Huynh**, Environmental Services Specialist  
City of San Jose

# 2015 Bay Area GHG Emissions by Source



Based on 100-year Global Warming Potential  
(Total = 85 MMT CO<sub>2</sub>e)

# 2015 Bay Area Residential Natural Gas Usage by Category



# BAAQMD Building Decarbonization Strategy



## LOCAL GOVT SUPPORT

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

## RULES

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 HPWH incentive programs and support scaling by local governments

# HPWH Incentive Programs

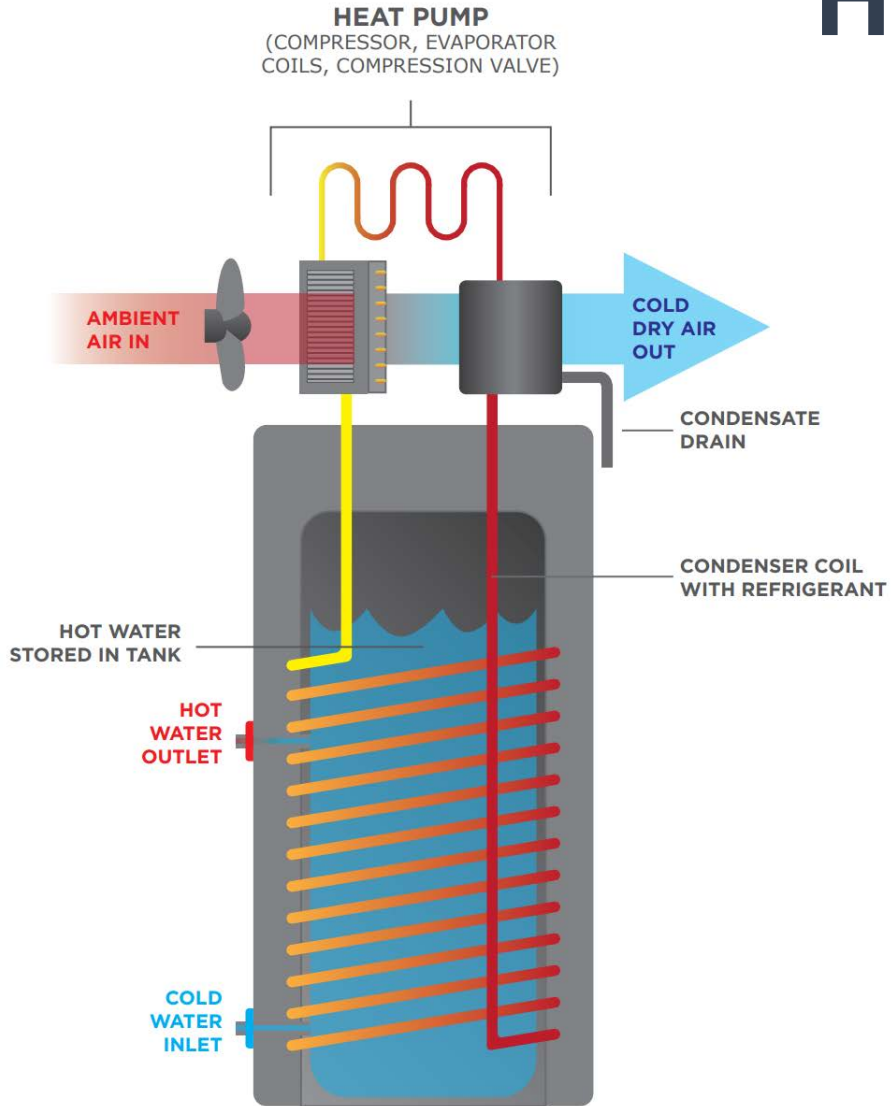


Image: Silicon Valley Clean Energy HPWH Buyers Guide

# HPWH Grantee Snapshots



**BayREN** will present on its HPWH retrofit program for multifamily buildings, in addition to its efforts to regionally coordinate HPWH incentive programs, reach all levels of the supply chain, and implement a regional contractor training program.

**SVCE** will present on its residential water heater replacement program, and share findings on how its residents are making consumer decisions on water heating appliances, based on data that SVCE is collecting.

**City of San Jose** will present on its Electrify San Jose incentive program, focusing on its multi-faceted HPWH engagement and education strategy targeting contractors, residents, and low-income/underserved communities.



# BayREN: Regional Coordination of Heat Pump Water Heater Incentives

Jennifer West, StopWaste

[jwest@stopwaste.org](mailto:jwest@stopwaste.org)  
(510) 891-6555

# Bay Area Regional Energy Network (BayREN)



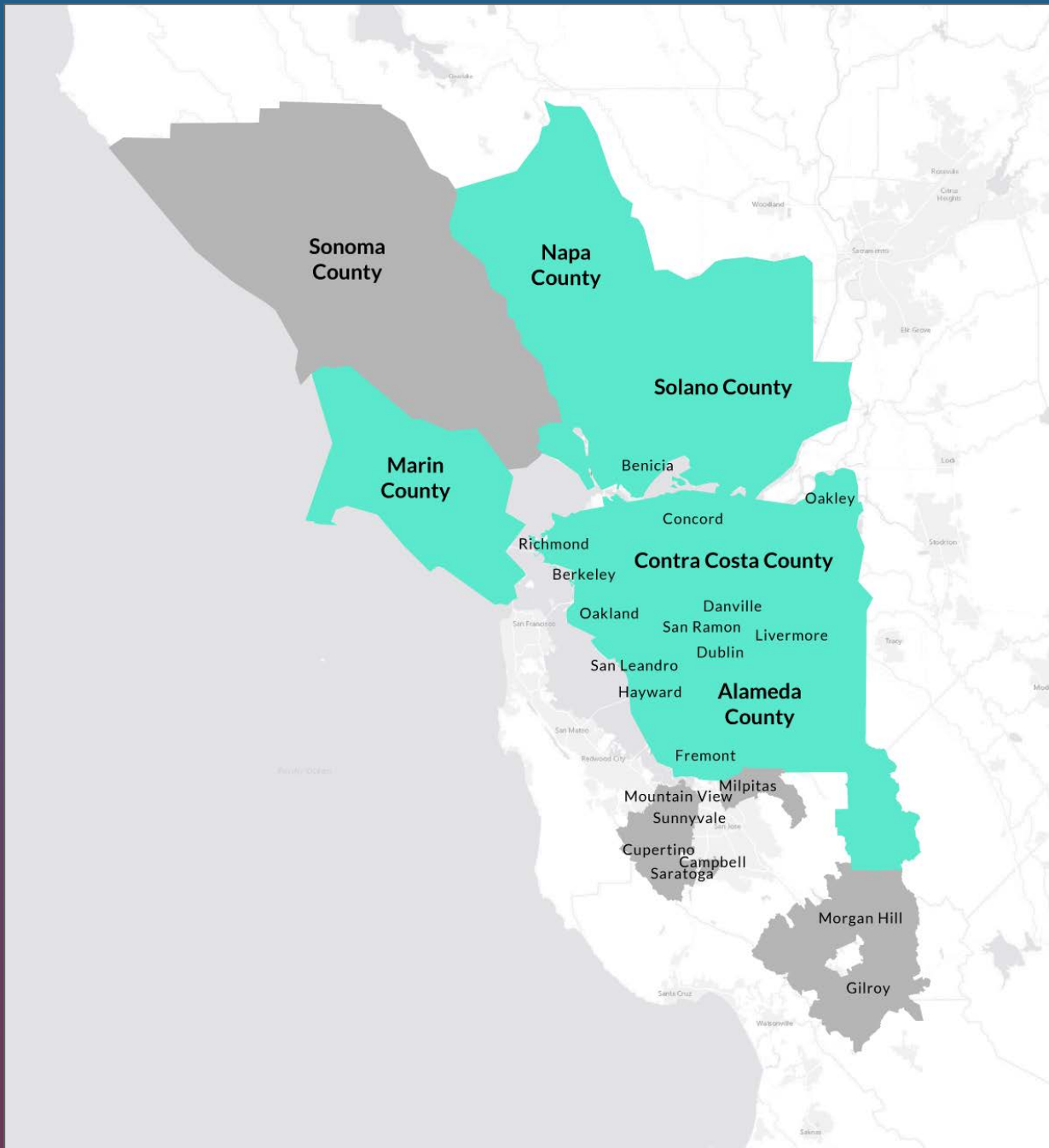
BayREN is:

- one of three regional energy networks (RENs) in California funded by the CPUC
- a collaboration of the nine counties that make up the San Francisco Bay Area
- focused on energy efficiency and related efforts



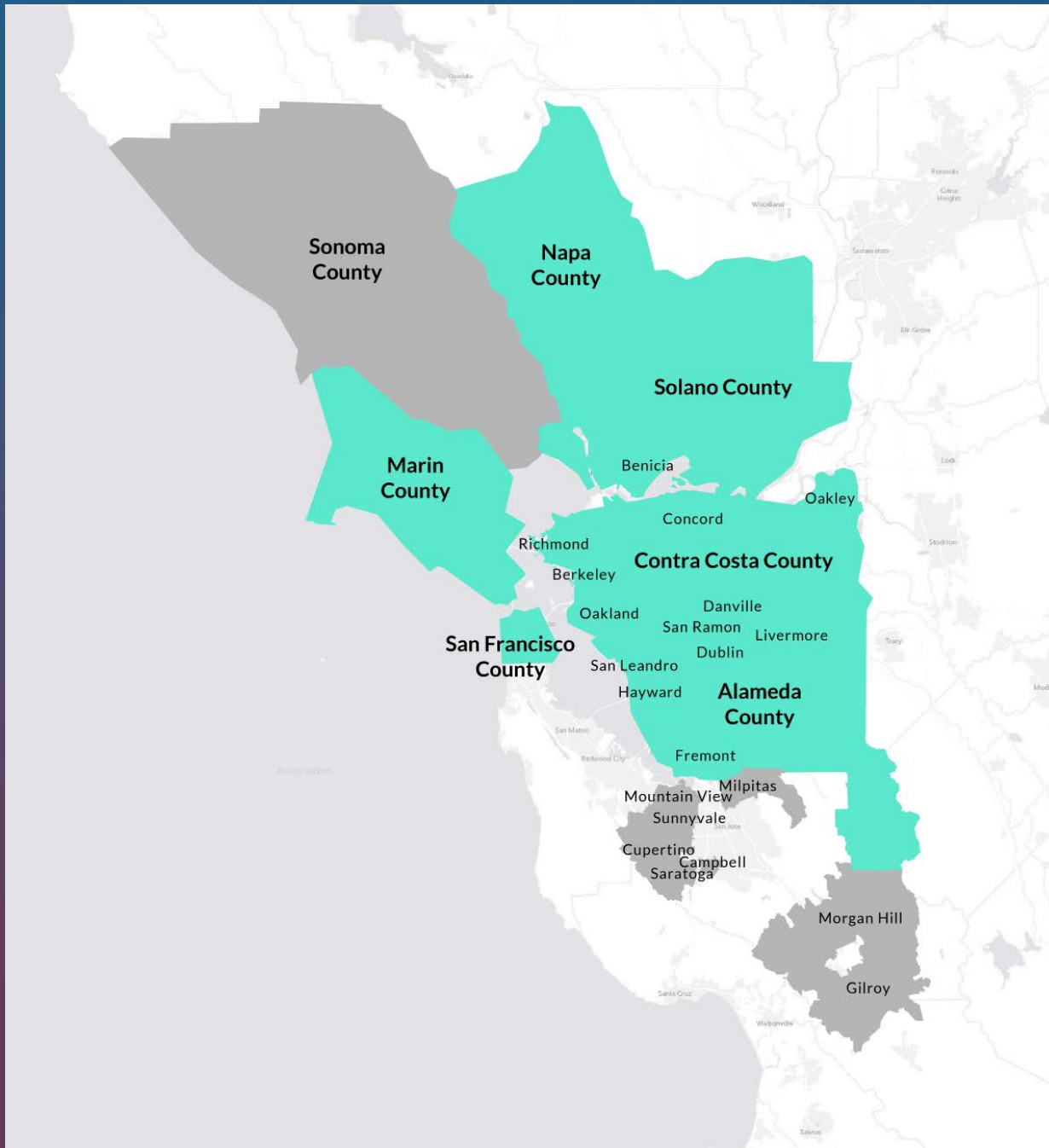
# Regional HPWH Program Operating Territories May 2020

EBCE and MCE territories



# Regional HPWH Program Operating Territories **September 2020**

EBCE and MCE territories  
**+CleanPowerSF**



# Regional HPWH Program Details

<b>Program Administrator</b>	BayREN / StopWaste, funding from BAAQMD, incentives paid by CCAs
<b>Midstream Program</b>	Paid to Contractors
<b>Equipment Requirements</b>	High-efficiency and grid-capable (QPL on website)
<b>Incentives</b>	\$1,000 per HPWH
<b>Geography</b>	Covers 5 of 9 counties with more to join
<b>Leverage</b>	Can be combined with BayREN Home + \$1,000
<b>Purpose</b>	Activate the market, increase volume and expertise, reduce emissions over the life of the HPWH



# HPWH Program

- Supply Chain engaged
- Contractors
  - Home+
  - Training
- BayREN Multifamily – installing HP technology for immediate emissions reductions
- BayREN Codes – Training Building Depts for permits

# Regional Coordination

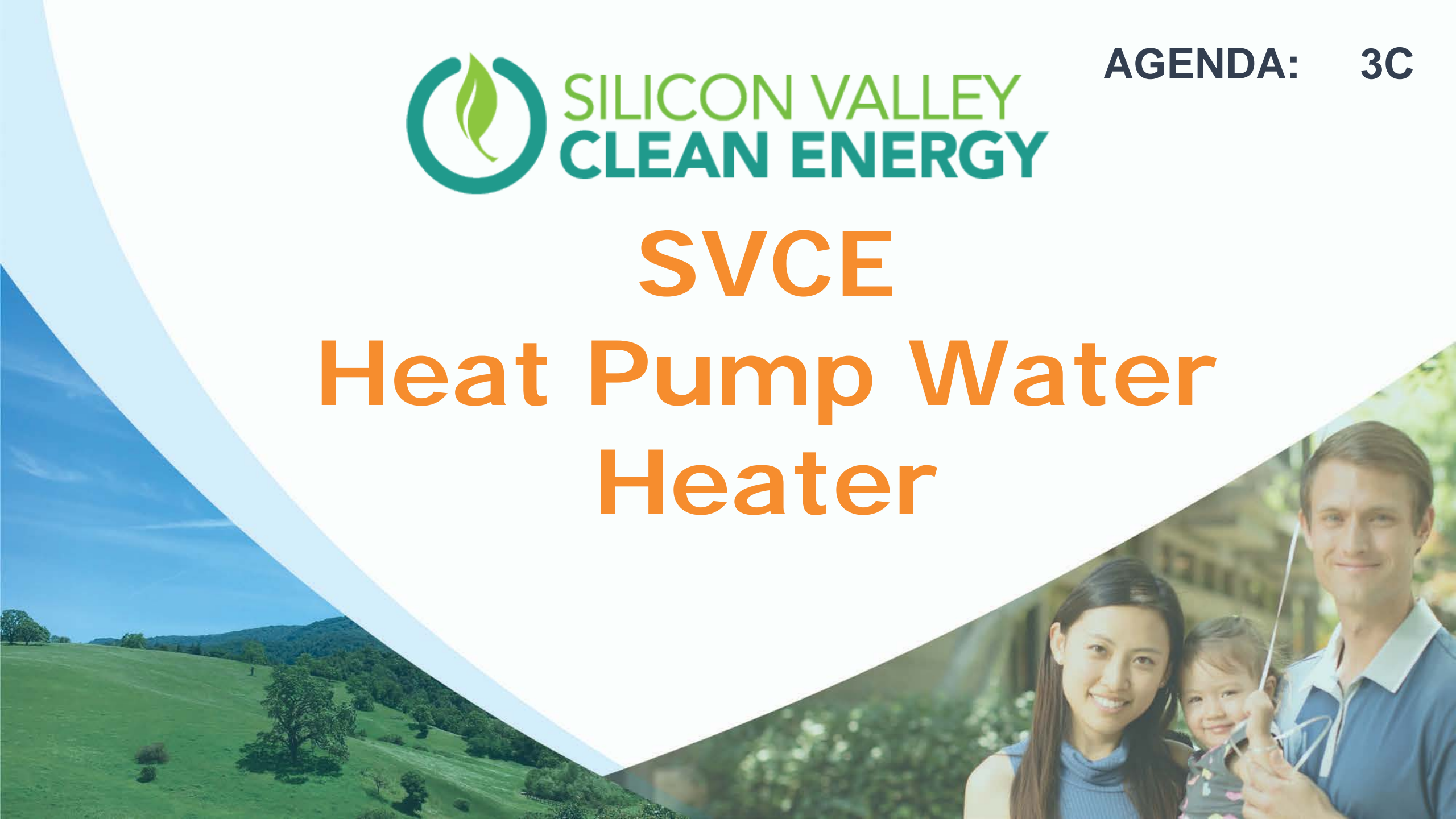
- SVCE Program
- San Jose Program
- Marin Program
- Others not funded by BAAQMD
  - Sonoma Clean Power
  - Palo Alto
  - Alameda Municipal Power





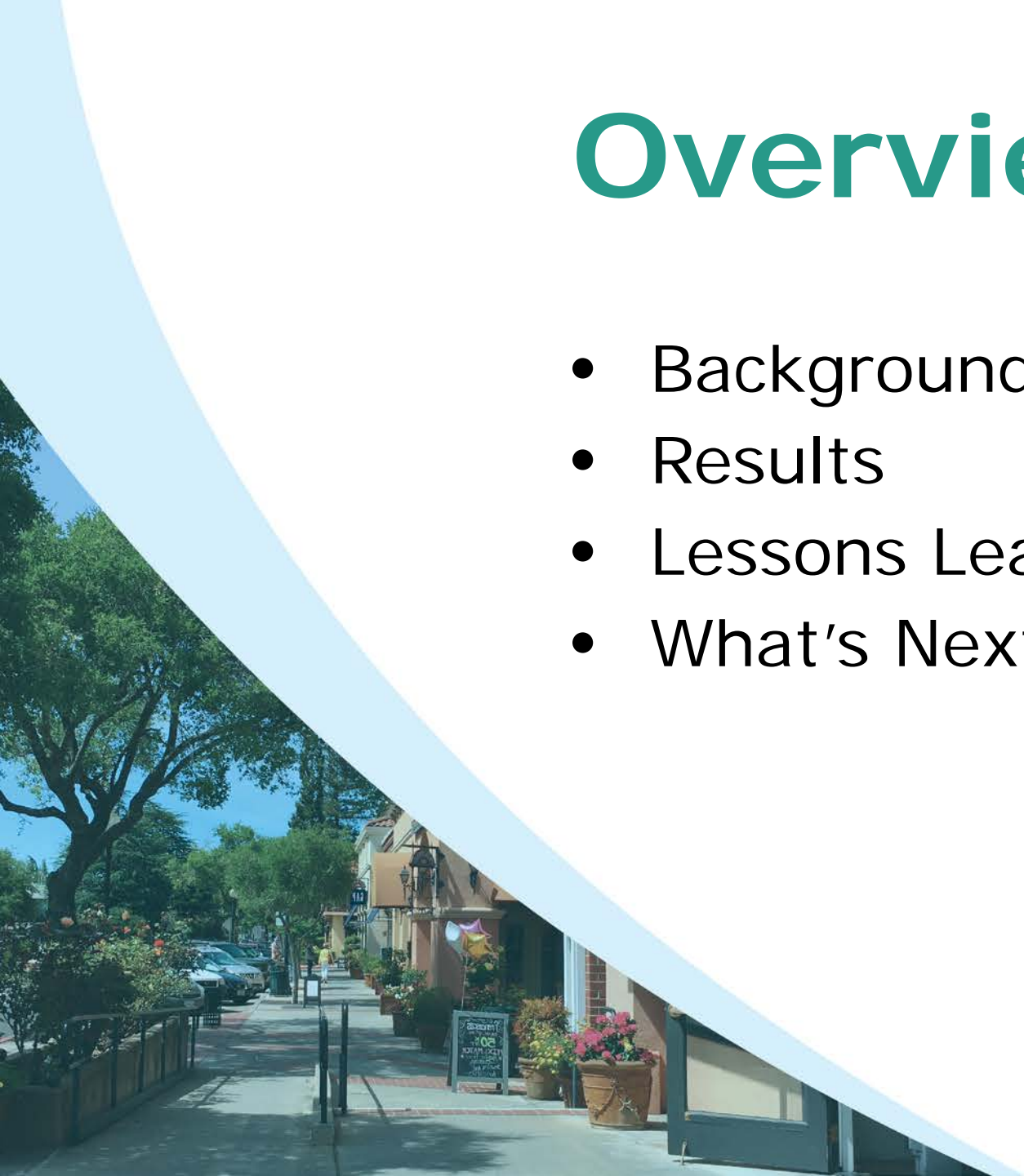
**AGENDA: 3C**

# SVCE Heat Pump Water Heater



# Overview

- Background
- Results
- Lessons Learned
- What's Next



# Background

## SVCE Mission

Collaborate with our 13 member agencies to reduce fossil fuels in buildings and transportation

Retrofit Heat Pump Water Heaters identified as highly challenging

Installed Cost

Contractor inexperience

Product scarcity



# The FutureFit Home

## Cleaner

The FutureFit Home doesn't use fossil fuels

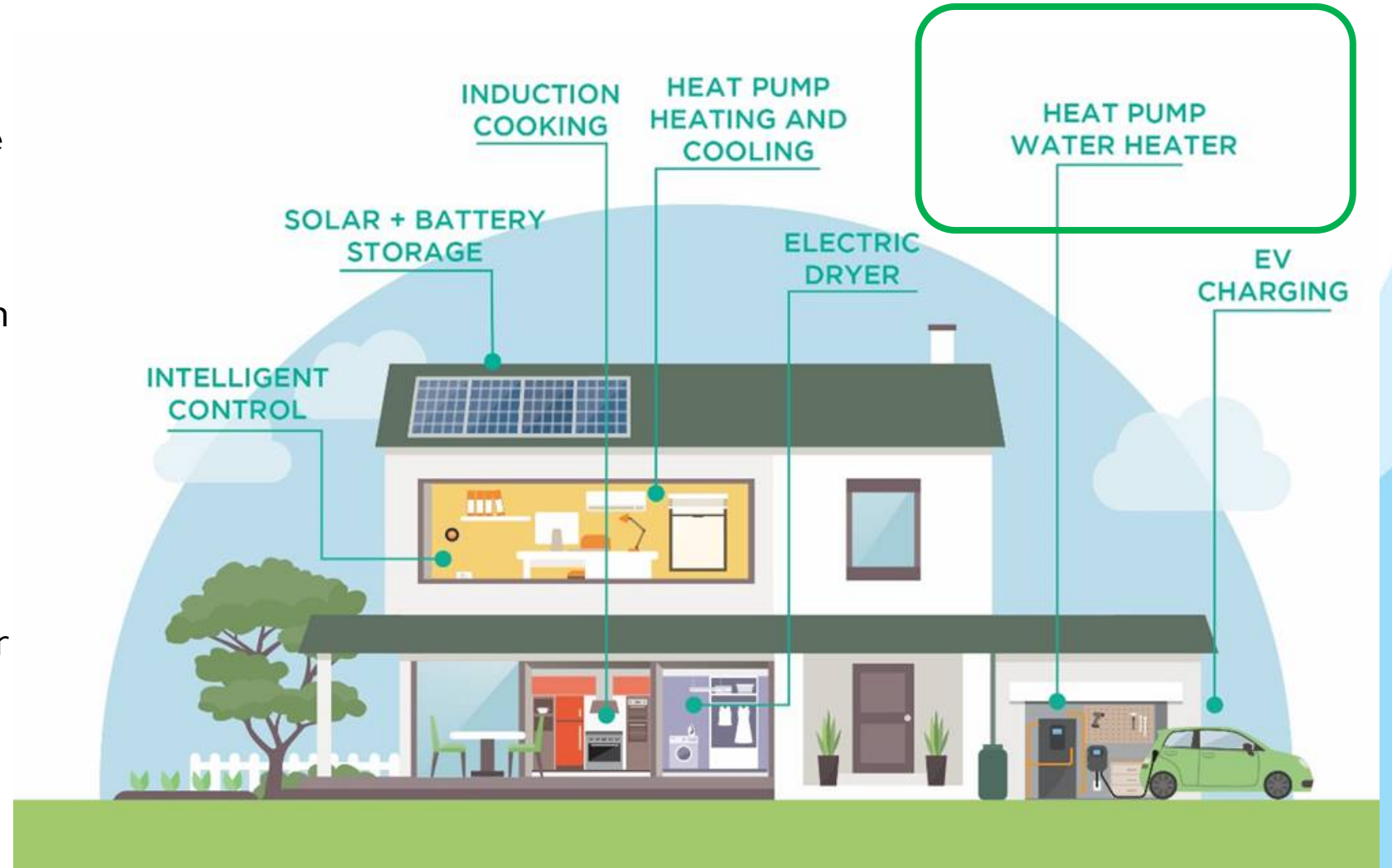
## Safer

No need for combustion or open flames

## Healthier

Indoor air quality is greatly improved

\$2,300 HPWH + Home Monitor  
+\$1,500 Smart Performance  
+\$2,500 Service Panel Upgrade



# Results

100 units budgeted

166 Total reservations within 4 months of launch

52 Withdrawn by customer

83 installed (many completions delayed with shelter-in-place)

35% installations included Service Panel Upgrade to 200A

Publicly viewable dataset of contractors, costs, and equipment utilized

[https://www.svcleanenergy.org/wp-content/uploads/2020/02/Reservation-Tracker-Public-Update-2020.05.01\\_Excel\\_WITH-CONTRACTOR-INFO.xlsx](https://www.svcleanenergy.org/wp-content/uploads/2020/02/Reservation-Tracker-Public-Update-2020.05.01_Excel_WITH-CONTRACTOR-INFO.xlsx)

# Lessons Learned

Half of all installations performed by 3 contractors, and 13 systems self-installed

Mixing Valve – required by program but could have been avoided using larger tank size

Cost Related – Service drop increase, interior space, costs more than gas retrofit (including rebate)

All participants already on Time-of-Use rate (effectively mandatory to keep HPWH cost-competitive with gas) prior to program participation

Even with highly active contractors, HPWH still a niche within the business

# What's Next

- Launch followup program in June
- Reduced incentive, no monitoring required, no mixing valve required
- Simplified enrollment & payment process
- Reassess late 2020 given new entrants into HPWH fuel switching space (CEC Build & Tech, SGIP, BayREN Home+, PG&E Water Saver)

# Electrify San José

BAAQMD Climate Protection Committee  
June 18, 2020





# Electrify San José

## Heat Pump Water Heater (HPWH) Rebate Program

	<u>Maximum Rebate</u> No Panel Upgrade	<u>Maximum Rebate</u> Panel Upgrade
Income-qualified (CARE/FERA)	\$3,500	\$6,000
All other residents	\$2,000	\$4,500

- Granted \$274,500 in rebates
- Goal: 65 installed HPWH with 20% for low-income
- To date: 25 installed HPWH with 8% for low-income
- Program-end: 122 installed with 50% for low-income



# The Fairways

## All-electric Affordable Housing Project

- 86 low-income units
- Receiving technical assistance from [Association for Energy Affordability \(AEA\)](#)
- Due to hard water, gas water heaters are replaced regularly



The Fairways at 305 San Antonio Ct. San Jose, CA

# The Fairways

## All-electric Affordable Housing Project

- 90% cost coverage for project to “pencil”
- Need all 3 HPWH funding sources due to tenant-landlord split incentive
- ~57% site energy reduction with proposed scope of work

Funding Source	Amount	Measures Covered
<a href="#">Low Income Weatherization Program for Multifamily Properties</a> (LIWP – MF)	\$375,000	<ul style="list-style-type: none"><li>• <b>In-unit: HPWH</b>, LED lighting &amp; low flow water fixtures</li><li>• Common area: laundry HPWH, LED lighting, ventilation fan controls, clothes washer</li></ul>
<a href="#">BayREN Clean Heating</a>	\$150,000	<ul style="list-style-type: none"><li>• <b>In-unit: HPWH</b>, LED lighting &amp; low flow water fixtures</li></ul>
<a href="#">Electrify San José</a>	\$145,000	<ul style="list-style-type: none"><li>• <b>In-unit: HPWH</b></li></ul>
<a href="#">Solar on Multifamily Affordable Housing</a> (SOMAH)	TBD	<ul style="list-style-type: none"><li>• Virtual Net Energy Metering (VNEM) solar PV system for tenant offset</li></ul>

# Lessons Learned

1. Educate and partner with technical experts
2. Ensure inclusive consumer engagement
3. Make engagement fun & interactive
4. Amplify unified message

# Educate and Partner with the Technical Experts

- Hosted 6 HPWH trainings for contractors and Building Department staff
- Included HPWH installation requirements in [Water Heater Installation Information](#)
- Issued RFI to develop a contractors list



Planning, Building and Code Enforcement

BULLETIN #293 03/11/2020 SUBJECT TO CHANGE

FOR ALL TYPES OF PROPERTIES

## Water Heater Installation Information



Prevent gas leaks and water damage during an earthquake by properly securing your water heater as outlined in this bulletin.

The Division of the State Architects Office also provides online [Guidelines for Earthquake Bracing for Residential Water Heaters](https://mitigation.eeri.org/wp-content/uploads/Guidelines-for-Earthquake-Bracing-Residential-Water-Heaters-PDF.pdf) (<https://mitigation.eeri.org/wp-content/uploads/Guidelines-for-Earthquake-Bracing-Residential-Water-Heaters-PDF.pdf>)

No permit is required for seismic bracing of existing water heaters.

This bulletin pertains to storage-type water heaters. For safety, obtain a building permit. Follow all specifications and regulations when you locate or replace a water heater.

### NATURAL GAS WATER HEATERS - REQUIREMENTS

**Permit process.** Single-family and duplex property owners can save \$40 by obtaining a water heater permit online at [www.sjpermits.org](http://www.sjpermits.org). Multifamily and commercial property owners must use the City's building permit application, found at [www.sanjoseca.gov/buildingbulletins](http://www.sanjoseca.gov/buildingbulletins).

**Prohibited locations.** Gas-fired water heaters use fuel combustion for heat. For safety, do NOT install them in bathrooms, clothes closets, rooms used for sleeping, or in any closet or confined space that opens into a bathroom or bedroom. *Exception:* Direct vent water heaters.

**Under stairways and landings.** Where not prohibited by other regulations, water heaters may be located under a stairway or landing.

**In a basement.** See page 3 for locating a water heater in a basement.

**In a garage.** Gas or electric water heaters that generate a glow, spark, or flame capable of igniting flammable vapors may be installed in a garage if the pilots, burners, or heating elements and switches are elevated at least 18 inches above the floor; any stand or platform base must be adequately anchored to the floor. If the water heater installed within a garage is enclosed in a separate, approved compartment that is accessed only from outside of the garage, it may be installed at floor level provided that the required combustion air is drawn from outside.

**In attics and other spaces that require a safe pan.** Locating a storage tank water heater in an attic or space where a leak could cause damage is prohibited UNLESS you install an approved safe pan below the water heater with a minimum ¼-inch drain to an approved, readily visible location.

### HEAT PUMP WATER HEATERS - REQUIREMENTS

**Permit process.** Please complete and submit a building permit application to obtain a permit for a heat pump water heater. These heaters require plumbing and electrical permits. Find the application at [www.sanjoseca.gov/buildingbulletins](http://www.sanjoseca.gov/buildingbulletins).

**Locations.** The Northwest Energy Efficiency Alliance (NEEA) sets forth specifications for heat pump water heaters. Heat pump water heaters that comply with NEEA's [Advanced Water Heater Specification](#) of Tier 3 or higher may be located in a garage, basement, or other conditioned space. Please note the following:

**Room size.** Heat pump water heaters draw air from the room to heat the water. The space or room must be at least 10x10x7 (700 cubic feet) or, if the room is smaller, there must be a door with a louvered panel with the panel at least 2' x 3' in size, to allow air to freely pass into the room. This also applies to accessory dwelling units (ADUs).

**Condensate drain.** Condensate must drain to an approved plumbing fixture or to a drywell.

**Adequate electric panel.** If the existing electrical service panel is not adequate for the added load, please see [Bulletin #260 Electrical Service Panel Upgrades](#) at [www.sanjoseca.gov/buildingbulletins](http://www.sanjoseca.gov/buildingbulletins) for more information.

# Inclusive Customer Engagement

- Trilingual outreach materials
- Bilingual staff to answer technical and programmatic questions
- Reaching the decision maker
- Future programs: financing options



Staff presenting to Spanish-speaking monolingual community members

# Fun & Interactive Engagement

*Carbon Free Living* Augmented Reality (AR) Experience

Hands-on experience to educate residents and building professionals on zero net carbon (ZNC) technologies



18' x 10' trailer



ZNC technologies



Make it interactive with AR

# Fun and Interactive Engagement

## *Carbon Free Living* Virtual Reality (VR) Experience

- Walkthrough of a ZNC home
- For events where trailer can't be on-site





# Amplify Unified Message



Bay Area Home Electrification Expo, October 2019

# Amplify Unified Message



- Statewide campaign launching this summer
- Join the Building Decarbonization Coalition for free at [buildingdecarb.org](https://buildingdecarb.org)

An aerial photograph of San Jose, California, showing a dense urban landscape with various buildings, streets, and green spaces. In the background, the San Geronimo Mountains are visible under a clear sky. A semi-transparent white speech bubble is overlaid on the left side of the image, containing text.

Thank you!

[sjenvironment.org/electrifysanjose](https://sjenvironment.org/electrifysanjose)

[Leanna.Huynh@sanjoseca.gov](mailto:Leanna.Huynh@sanjoseca.gov)

408-975-2516

# Appendix

# Zero Net Carbon (ZNC) Buildings Video

Email [energy@sanjoseca.gov](mailto:energy@sanjoseca.gov) to customize this video for your jurisdiction!



[https://www.youtube.com/watch?v=-rnwslzBWj4&feature=emb\\_logo](https://www.youtube.com/watch?v=-rnwslzBWj4&feature=emb_logo)

# How to Increase the Market for HPWH and All-Electric Affordable Housing

## From Association for Energy Affordability (AEA)

### CHALLENGES

- Retrofitting an existing mixed fuel building to be all-electric is very important, but also can be very complicated
  - Still very expensive: electrical upgrades, contractor unfamiliarity or lack of experience
  - Technical challenges: electrical upgrades, spaces designed for gas equipment
  - Building Department stringency: sometimes requires custom technical solutions that receive pushback from inspectors
  - Hesitance from stakeholders from lack of exposure to newer technologies
- Electrical infrastructure capacity and redesign is often a large barrier to these projects, both technically and financially
- Retrofit projects are often not plug and play
  - Fairway Apts requires great amount of technical and financial assistance because the installation is very complicated, and is only made possible by available program funding streams and technical assistance (TA)

### SOLUTIONS

- Supporting incentive programs to continue to help buy down the cost to building owners and ramp up contractor experience
- Promoting TA support to encourage and enable more complicated installations that might not otherwise be feasible
  - TA for scoping, design, finding creative technical solutions, coordinating multiple funding streams to be brought to a project
- Promoting effective program design to incentivize and support tenant-benefiting electrification, and allow for co-leveraging with other programs and funding sources
  - To reach affordable multifamily market, program design and co-leveraging are key: need higher incentive rates for tenant-benefiting measures to incentivize building owners to invest in tenant spaces
- Promoting expansion of contractor market
  - Contractor pool is still relatively small, but these projects allow for exposure to new equipment and contractors have shown to gain rapid understanding

# Next Steps



- HPWH Grantees will complete grant-funded projects between Q4-2020 and Q2-2021. Grantees will then report on final project successes, challenges, and learned lessons. Project results and best practices will be shared widely to achieve regional scaling
- The Air District will continue to monitor and understand evolving operational costs of heat pump technologies, in order to drive forward a just and equitable transition from natural gas to electric appliances