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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

- Reference electric heat pump
- Electric resistance
- LPG
- Natural gas
- High Efficiency Heat Pump

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

- Electric resistance
- LPG
- Natural gas
- High Efficiency Heat Pump

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

## Upstream
- TECH Initiative (C&T)
- HVAC Statewide Program (EE)
- Plug Load (EE)

## Midstream
- TECH Initiative
- Bay REN Electrification Program

## Downstream
- **IOU**
  - San Joaquin Valley Clean Energy Pilot – Select communities in SJV
  - Disadvantaged Community Pilot – SCE Territory
  - Watter Saver - Select communities in SJV, PG&E territory
  - Electrification Pilot – SCE territory
  - Wildfire Rebuild Programs – Post fire communities in PG&E, SCE, SCP, MCE territories
- **Non-IOU**
  - Low Income Families and Tenants (LIFT) - Marin Clean Energy territory
  - Heat Pump Rebate Programs – SMUD territory
  - Electrification Programs – MCE territory
  - BUILD - Statewide

(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

- 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.

Budget and Evaluation
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
## Global Warming Potential (GWP) of Common Refrigerants

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

### Programs

- **Low GWP**: Programs that utilize appliances with Low GWP to receive kicker incentives.
- **Mid GWP**: Programs that utilize appliances with medium or high GWP may receive incentives until 2023.
- **High GWP**: 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

Photo: ImproveNet.com
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.

Photo: IsaacHeating.com
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?

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

BAAQMD’s
Building Decarbonization Strategy

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

September 1, 2020

Abby Young
Climate Protection Manager
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.
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

- Transportation 41%
- Stationary Sources 26%
- Energy 14%
- Buildings 10%
- Waste 3%
- Agriculture 1%
- F-Gases 4%

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

Source: BAAQMD (2017) Spare the Air: Cool the Climate - Clean Air Plan
2015 Bay Area Residential Natural Gas Usage by Category

- Water Heating: 39%
- Space Heating: 57%
- Cooking: 4%

Source: BAAQMD. Emission Inventory Source Category Methodologies
Building Decarbonization Elements

- Energy Efficiency
- Electrification
- Load Management
<table>
<thead>
<tr>
<th>Category</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LOCAL GOVERNMENT SUPPORT</strong></td>
<td>Develop resources to help local governments implement a suite of building decarbonization strategies.</td>
</tr>
<tr>
<td><strong>RULEMAKING</strong></td>
<td>Explore new rules for appliances in residential and commercial buildings.</td>
</tr>
<tr>
<td><strong>COORDINATION</strong></td>
<td>Strengthen collaborations with the Building Decarbonization Coalition, BayREN, and other regional partners.</td>
</tr>
<tr>
<td><strong>INCENTIVES</strong></td>
<td>Fund pilot heat pump water heater incentive programs, and support scaling by local governments.</td>
</tr>
</tbody>
</table>
Rule-making Challenges

- Limits to authority
- Impacts on equity
- Impacts on workforce, other stakeholders
Local Government Support

Clean Building Compass

RESOURCES BY CONSTRUCTION PHASE

EXISTING BUILDINGS  NEW CONSTRUCTION  RENOVATIONS

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 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:
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.
Thank You

Abby Young
Climate Protection Manager
ayoung@baaqmd.gov
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

<table>
<thead>
<tr>
<th>Measure</th>
<th>Rebate Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Pump Water Heater</td>
<td>$1,000</td>
</tr>
<tr>
<td>Heat Pump HVAC (pre-existing heating/cooling equipment)</td>
<td>$1,000</td>
</tr>
<tr>
<td>Heat Pump Clothes Dryer</td>
<td>$300</td>
</tr>
<tr>
<td>Induction Cooktop/Range</td>
<td>$300</td>
</tr>
</tbody>
</table>
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.

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

• 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

Photo credit: A. O. Smith
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

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(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
<table>
<thead>
<tr>
<th><strong>Program Administrator</strong></th>
<th>BayREN / StopWaste / Energy Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eligible Contractors</strong></td>
<td>Contractors with C-20, C-36 or General Contractors</td>
</tr>
<tr>
<td><strong>Equipment Requirements</strong></td>
<td>High-efficiency and grid-capable (QPL on website)</td>
</tr>
<tr>
<td><strong>Equipment Incentives</strong></td>
<td>$1,000 per HPWH</td>
</tr>
</tbody>
</table>
| **Site Requirements**     | • 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
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