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CEC Staff Workshop – Heat Pump Goals, Supply Chain, and Programs:

Lessons Learned from TECH

April 5, 2022

Teddy Kisch Building Decarbonization Fellow





Agenda

- 1 TECH Clean California Overview
- 2 Progress to Date
- 3 Considerations for Scale



TECH Clean California Overview

TECH Clean California Overview

What is TECH Clean California?

- **Goal:** Support heat pump market transformation and help put CA on a path to carbon-free homes by 2045
- **Our Approach:** leverage a relatively small initial investment to inform California's broader building decarb framework and investment plan
- **Guiding principles:** scale, equity, regulatory simplicity, and market transformation
- Key Metrics:

TECH Team:

• ~\$72 million in incentives, remaining for market transformation activities

- 40% equity target supporting low-income households / DACs
- Funding must be allocated proportionally to gas IOU territory

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Map source: https://cecgis-caenergy.opendata.arcgis.com/pages/pdf-maps

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TECH Clean California Strategy



Spur the clean heating market through statewide strategies

Activate the supply chain

- Contractor incentives
- Streamlined Incentive Clearinghouse
- Technical and sales training

Drive consumer demand

Statewide marketing campaign and website

Create scalable models through regional pilots

Improve targeting and project finance

- Target customers using meter-based analysis
- Deploy a Tariffed-On Bill financing pilot

Expand benefits to HTR customers

- Integrate heat pumps into low-income programs
- Multi-family pilots targeting property owners

Streamline installation

- Streamline permitting and installation costs
- Enable load-shifting

Innovation through Quick Start Grants



Inform long-term building decarbonization framework

Develop public reporting site

 Inform policymakers and market actors on progress and impacts

Quantify decarbonization impacts

Avoided costs, grid benefits, and customer bill impacts

Inform policy development

• State, regional, and local regulatory policy

TECH Progress to Date

Create consistent program rules / layering

Single Family = Property with 4 or fewer dwelling units

Baseline Incentives

- Available everywhere in Gas IOU territory where TECH doesn't have a partnership
- Simple and concise measure structure to encourage engagement
- Developed to facilitate future layering with PA incentive programs

Enhanced Incentives

- Available in regions where TECH has integrated with a partner PA program
- Additional incentives added on top of baseline measures to support quality installations and decrease electricity consumption
- Cost sharing between TECH and partner PA supports collaboration, incentive leverage









Market Engagement

Progress to date:

- Enrolled over <u>750</u> contractors, **412** active participants
- Engaged major manufacturers and distributors on enrollment, marketing and training





Results as of 4/4/2022

Single Family Heat Pump Incentives

Heat Pump HVAC Incentives per Month





Heat Pump Water Heaters Incentives per Month

Results as of 4/4/2022 - Includes all submitted applications

Single Family HVAC Incentives



% of Total
26%
35%
39%

Results as of 4/4/2022

3,284 units submitted – \$6.1M

Furnace Setting After Install	% of Total
Decommissioned	88%
Setup as Blower Only	<1%
Emergency Backup Only	12%

Installation Component	% of Total
Ducts sealed/replaced	16%
Manual-J Completed	10%
Full System Performance Test	4%
Smart T-Stat Included	38%

Single Family HPWH Incentives



HPWH Capacity	% of Total
40	4%
50	61%
65	18%
80	17%

Results as of 4/4/2022

467 units submitted – \$767,700

Previous Water Heater Fuel Type	% of Total
Natural Gas	92%
Electric Resistance	4%
Propane	4%

Installation Component	% of Total
Thermostatic Mixing Valve	70%
Water Heater Upsized	60%
Panel Upgrade Required	5%

Multifamily Incentive Reservations

\$3.6 million reserved



Measure	Total Units Served	Projects	% of Total
In-apartment HPWH	600	7	18%
Central HPWH	944	13	37%

Measure	Total Units Served	Projects	% of Total
Individual apartment HVAC	729	19	38%
Central HVAC	49	1	<1%

Results as of 3/18/2022

Participation by County (Single Family)





HP HVAC leaders: Riverside + San Diego Counties



Results as of 4/4/2022

Create a robust data reporting / QA infrastructure

Data Acquisition Timeline





What will it take to install 6 million heat pumps by 2030

Start scaling installs now

• Waiting dramatically increases the year-over-year growth rates required to achieve the 2030, 2045 targets

Dedicated Funding, Plan for Scale:

- A long-term, simplified structure that sends clear, consistent market signals (similar to California Solar Initiative)
- Seamless incentive layering aligning TECH eligibility, application requirements where possible with other state/local programs
- Mature financing approaches, dedicated focus on ensuring equity, installations in low-income / disadvantaged communities

Clear and Consistent Market Communication:

- Clear signals to supply chain, design community to plan for scale
- Consistent consumer messaging and educational resources to support the customer journey

What will it take to install 6 million heat pumps by 2030

- Address non-incentive barriers (Infrastructure, Workforce Training and Streamlining the Install Process, etc.):
 - Retrofit ready infrastructure (panel upgrades, 120V heat pump, pre-wiring, smart load management, etc.)
 - Integrating training infrastructure across all aspects of supply chain, building community, permit inspectors, etc.
 - Aligning these goals with state agencies / permitting process

Rigorous Impacts Quantification (perhaps most important!)

- TECH data reporting enables meter-based analysis, quantification of heat pump value (GHGs, NOx, peak demand, bill impacts, health/safety, etc.)
- Public reporting is critical to accelerating information share
- Flexibility to respond to information and adjust course as needed

Thank You

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TECH Achievements to date



Spur the clean heating market through statewide strategies

Activate the supply chain

- > 750 contractors enrolled
- > \$6.9 million SF incentives paid
- > \$3.8 million MF incentives reserved
- Distributor desk promotions and campaigns
- Technical and sales training

Drive consumer demand

- The Switch is On statewide marketing campaign
- Manufacturer marketing campaigns
- Contractor marketing campaigns



Create scalable models through regional pilots

Regional Quick Start Grants

- 11 projects launched in January 2022
- 8 of 11 projects (73% of funding) serve lowincome households

Expand benefits to HTR customers

- Enhanced incentives through collaboration with low-income programs
- Multi-family pilots targeting property owners

Financing

- Tariffed on-bill financing pilot
- Completed Integration with GoGreen



Inform long-term building decarbonization framework

Develop public reporting site

- Finalizing data access
- Public reporting site will launch in July

Quantify decarbonization impacts

• TBD, waiting on data access

Inform policy development

 Beginning to leverage initial application data to support inquiries

Addressing barriers with Regional Pilots, Quick Start Grants

Pilot	Objective
Tariffed On Bill Financing	Launch TOB program with partner utility to expand access to financing
Low Income Integration	Collaborate with existing LI programs to more fully incorporate heat pumps
Customer Targeting	Identify and engage customers who can benefit most from heat pumps
Multifamily Housing	Provide deep technical support in designing building systems that reduces the perceived risk of electrifying
HPWH Load Shifting	Target contractors as key market actors to maximize HPWH load shifting
Streamlining Permitting	Design code-compliant, 1 Day HPWH permit process

Quick Start Grants

Objective

Fund high-impact, transformative strategies to increase the installed base of heat pump technologies and accelerate heat pump deployment.

2021 Solicitation

- 11 winning projects began work in January 2022
- 8 of 11 projects (73% of funding) serve low-income households
- For information on the grantees, visit <u>https://energy-solution.com/tech-qsg/</u>

2022 Solicitation

- Next solicitation will be open June July 2022
- Grants up to \$300,000 for work over 1 year
- Looking for scalable, fast-deploying pilots with focus on low-income or energy-burdened households or historically underserved communities



Quick Start Grants: Streamlining Installation

Barriers Installation is slower when you fuel switch Installation is slower too customized Image: Customized customized Image: Customized customized customized Image: Customized customized customized Image: Customized customized customized Image: Customized customized customized customized Image: Customized customized customized customized Image: Customized customized customized customized customized Image: Customized cu

Barnett Plumbing, Loaner Water Heaters for Emergency Fuel-Switching (Livermore, CA & surrounding area)

Loaned gas water heaters bridge time to install fuelswitching infrastructure Small Planet Supply, Parkside Apartments HPWH (Delano, CA)

Test of pre-designed, packaged, central heat pump boiler using natural refrigerant in farmworker multifamily housing New Buildings Institute, 120V HPWH Field Test (Statewide)

Field study of emerging 120V HPWH designs from 4 manufacturers Institute of Heating and Air Conditioning Industries, Inc. (IHACI), Virtual Technician Software Platform (*Statewide*)

Software system provides realtime remote installation support and equipment monitoring by master technicians

Quick Start Grants: Making Programs More Inclusive

Barriers



Solutions

Franklin Energy and MCE, Augmentation of Income-Qualified Electrification Program (North Bay and East Bay)

Augmentation of program funds for existing Home Energy Savings program to home repairs that prevent low-income customers from electrifying. Redwood Coast Energy Authority, Air Source Heat Pump Incentives for Unregulated Fuel Customers (Eureka area)

Targeted outreach to remote communities, including tribal lands, that are unconnected to gas system and ineligible for previous incentive programs. Learnings will be shared with Rural and Hard to Reach Working Group

Quick Start Grants: Reducing Energy Costs

Barriers



Concern about increasing electricity bills



Lack of research on interactive effects

Solutions

The Energy Coalition, Basset Avocado Heights Advanced Energy Community HPWH (Bassett/Avocado Heights, CA)

HPWH added to a CEC EPIC-funded solar + storage pilot in an LMI advanced energy community, analyzing the impact of distributed PV on post-electrification energy bills

AESC, Interactive Impacts of HPWH in Manufactured and Mobile Homes (*Statewide*)

Installation of HPWH in manufactured or mobile homes in high poverty regions, to test installed costs, reductions in space conditioning energy consumption and cost, and the impacts on customer health and comfort

Quick Start Grants: Building Capacity for Lasting Change

Barriers



Health hazards in affordable housing



Lack of familiarity from owners and tenants



Solutions

BlocPower and City of San Luis Obispo, Better Buildings SLO Pilot (San Luis Obispo)

Retrofit 10-12 affordable multi-family units with HPWH and air source heat pumps. Establish a Community Advisory Board to empower community members to and devise a communications plan

Revalue, Green and Healthy Homes (Oakland area)

Eliminate home health hazards and code violations in multifamily affordable housing through electrification. BlocPower provides social impact financing, and Cypress Mandela will train underrepresented groups in the HVAC workforce

USGBC-LA, Electrification in Green and Affordable Homes Program (Los Angeles area)

Install HPWH and ASHP in naturallyexisting affordable housing, leveraging the existing Green Affordable Homes Program to evaluate the impacts on tenants and conduct outreach and education

Supply Chain / Stakeholder Engagement

Joint marketing and contractor outreach conducted alongside a wide array of stakeholders

