

TECH Clean California:

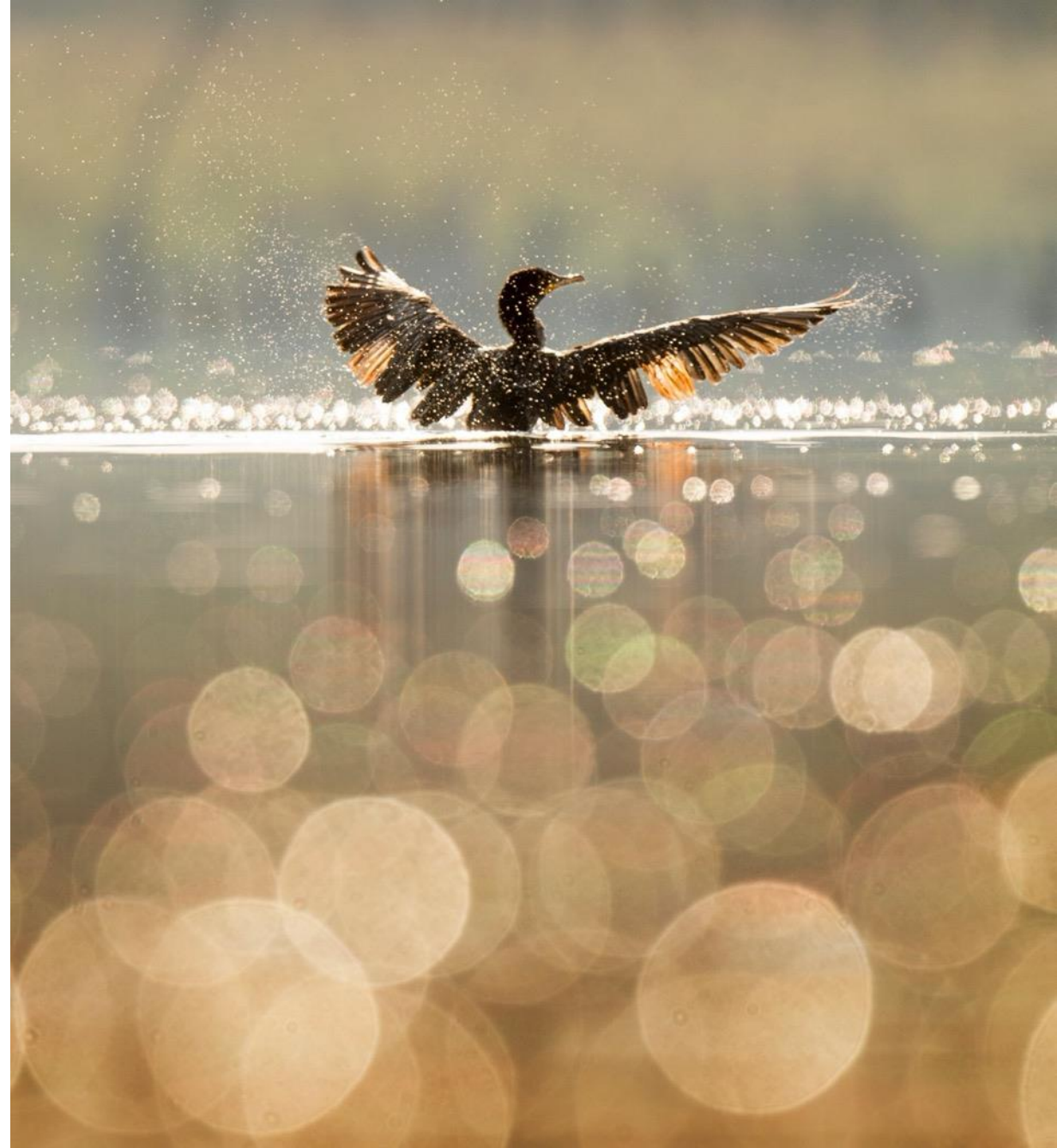
Lessons from Year 1 of California's Heat Pump Market Transformation Program

August 18th, 2022





Agenda

- 1 TECH Clean California Vision
- 2 Incentives & Market Engagement
- 3 Consumer Engagement
- 4 Pilots & Quick Start Grants
- 5 Informing the Long-Term Building Decarbonization Framework
- 6 Q & A



Goal: Carbon Free Homes by 2045

| | Current | Interim Goals |
|--|---------------------|---|
| <div> Heat Pump Water Heating</div> | < 2% installed base | 6 million heat pumps installed by 2030 Climate ready / friendly homes: <ul style="list-style-type: none">• 3 million by 2030• 7 million by 2035 |
| <div> Heat Pump HVAC</div> | < 5% installed base | 50% of funding delivered to low-income households or disadvantaged communities |

Installed base estimates based on RASS 2019 data: https://webtools.dnv.com/CA_RASS/

If we are going to install 6 million heat pumps by 2030...

Start Now and Iterate — We have 8 years. There is no time to waste.

Expect Demand — Most clean heating programs have run out of funding quickly. Plan for this.

Keep It Simple — Contractors are busy. Don't let perfect be the enemy of the good.

Catalyze Innovation — Use pilots and program data to inform policies and test scalable deployment models.

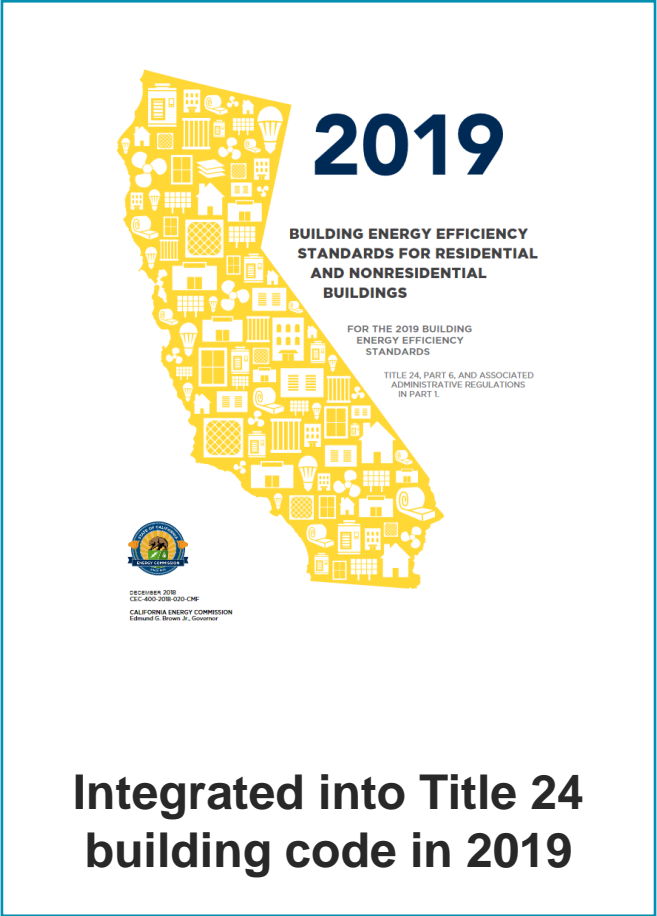
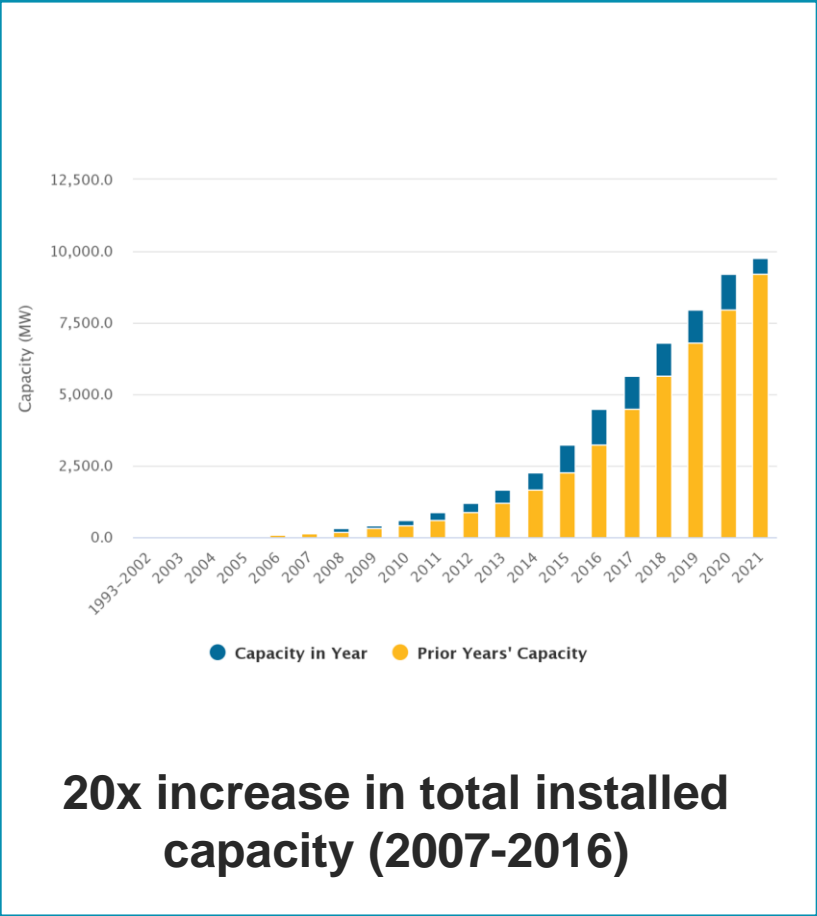
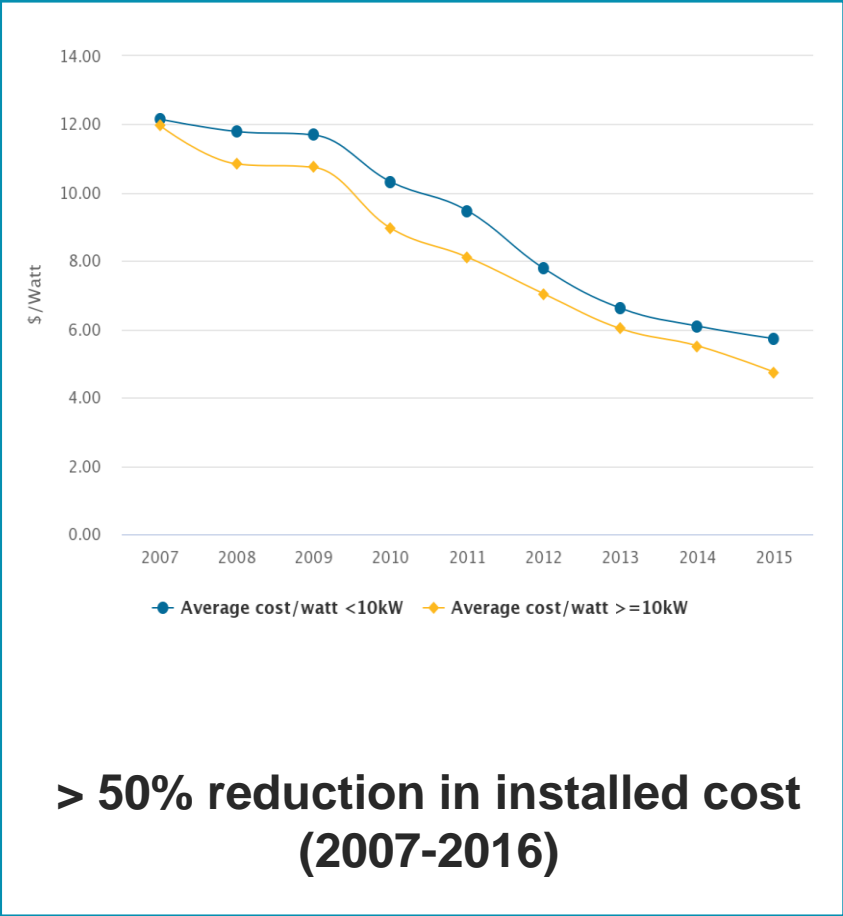
Measure Performance — Make efficiency and decarbonization into an investable, clean energy resource.

Align Investments & Milestones — Incentives, milestones and target dates play an important role.

1 TECH Clean California Vision

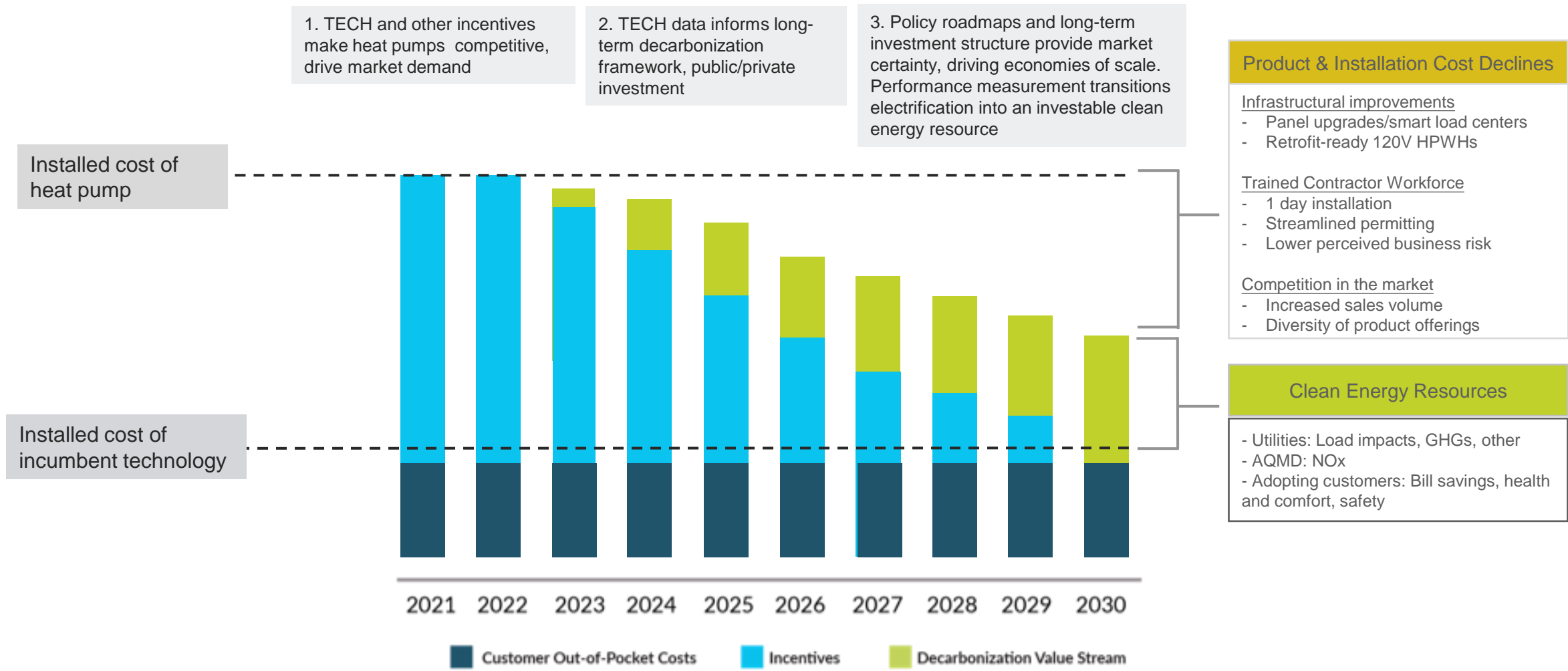
Learning from previous market transformation success

The California Solar Initiative (CSI): 10-year, ~\$2 billion initiative to transform the residential solar market

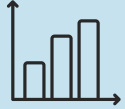


CSI Data Source: www.californiadgstats.ca.gov

TECH Vision – Bending the Heat Pump Cost Curve



TECH Clean California Program Activities



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
- Website with fact sheets, contractor directory and incentive finder



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 Team:



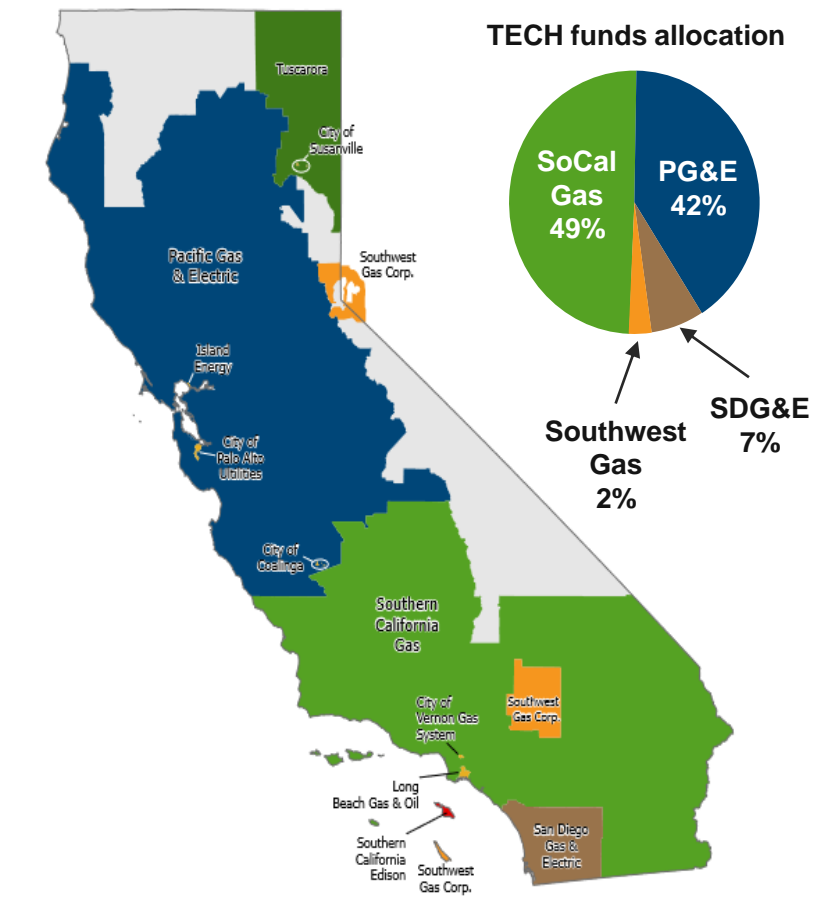
Tre'Laine

2 Incentives and Market Engagement

Market incentives to make it easier and cost-competitive for contractors to sell and install heat pump technology.

TECH Incentive Design Approach

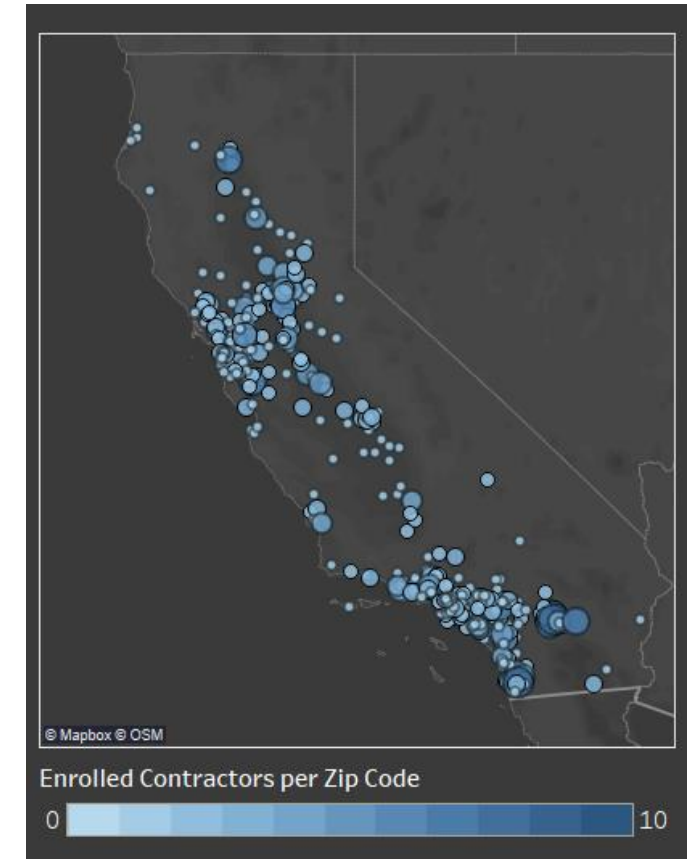
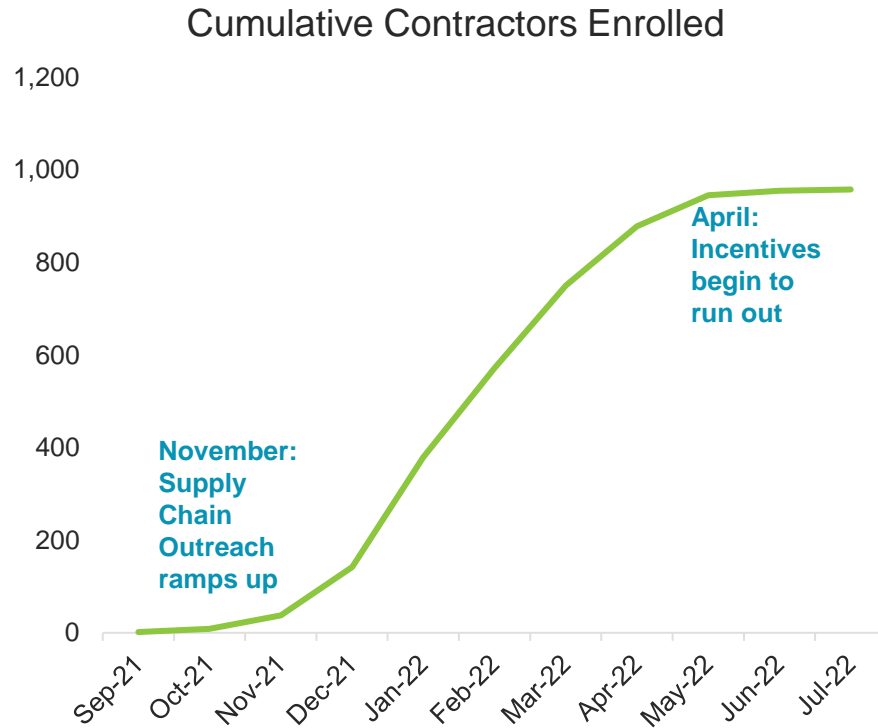
| Incentive Design Element | Rationale |
|--------------------------|--|
| Incentive Amount | Attract interest and instill a sense of urgency / opportunity. Create price parity with incumbent equipment. |
| Geographic Region | All customers within gas IOU territory. |
| Layering | Layering serves two functions: 1) Maximizes TECH resources; 2) supports enhanced incentives for higher efficiency and quality installation. |
| Eligibility | Allow code minimum and dual-fuel; comprehensive data provides valuable insights. |



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

Expect Demand

7 months, 900 contractors enrolled (3.5% of CA HVAC + WH contractors)

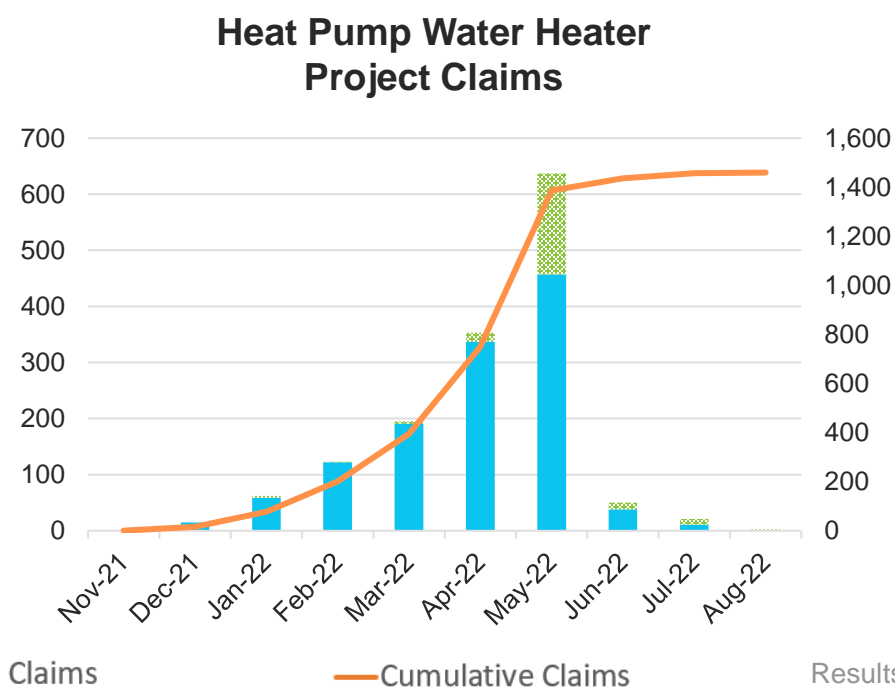
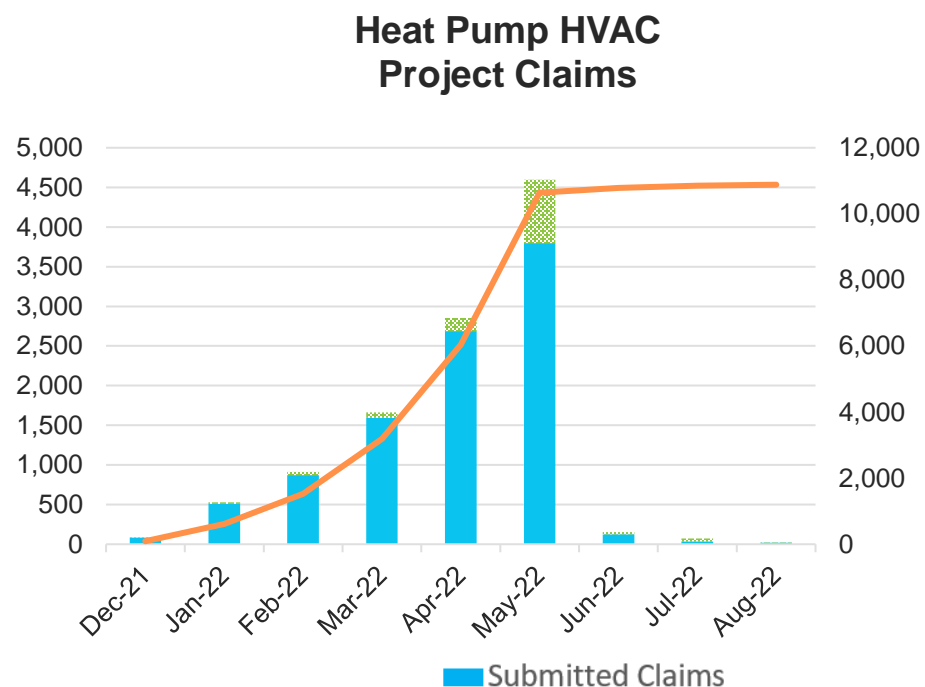


Lessons Learned:

- Incentives and long-term policy direction make participation strategic.
- Working with key supply chain actors unlocks participation
- Enrollment far surpassed initial expectations, requiring significant revisions to TECH onboarding and communication processes

Plan for Scale, Keep it Simple

> 12,000 units deployed/reserved in first six months, exhausting most available single family TECH funding by May



Results as of 8/15/2022

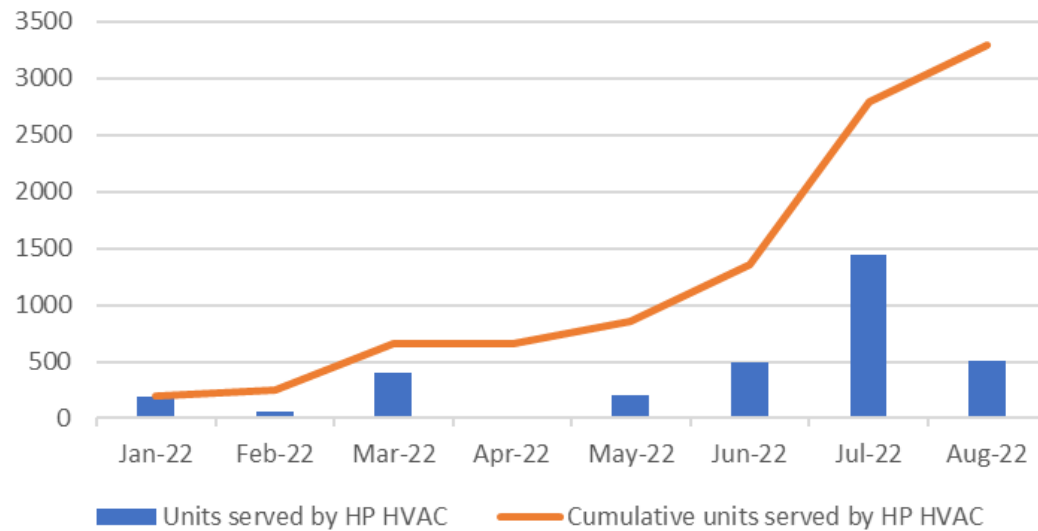
Lessons Learned:

- Even with the May install rate, need ~6-10x increase participation to hit California's 2030 target of 6 million heat pumps!
- Layering is important to scale investment, but it can't compromise the simplicity of the message

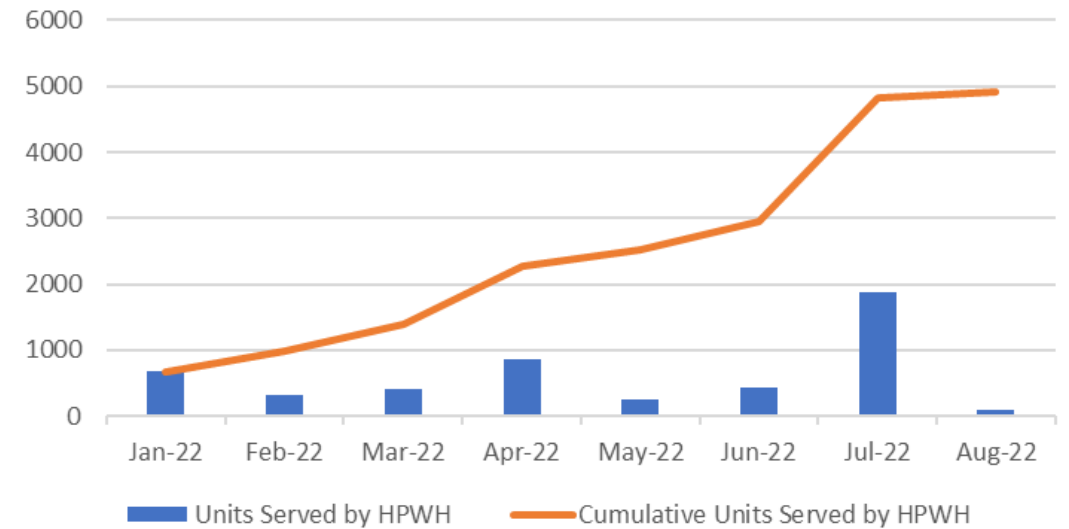
Multi-family Units Served by Heat Pumps

8,000+ MF units, ~50% in disadvantaged communities, > 50% low-income

Multifamily Units Served by Heat Pump HVAC
Reserved



Multifamily Units Served by Heat Pump Water
Heater



*Numbers represent the number of multifamily dwelling units being served by heat pump technologies. For example, one central plant may serve 30 units. Numbers based on reservation date.

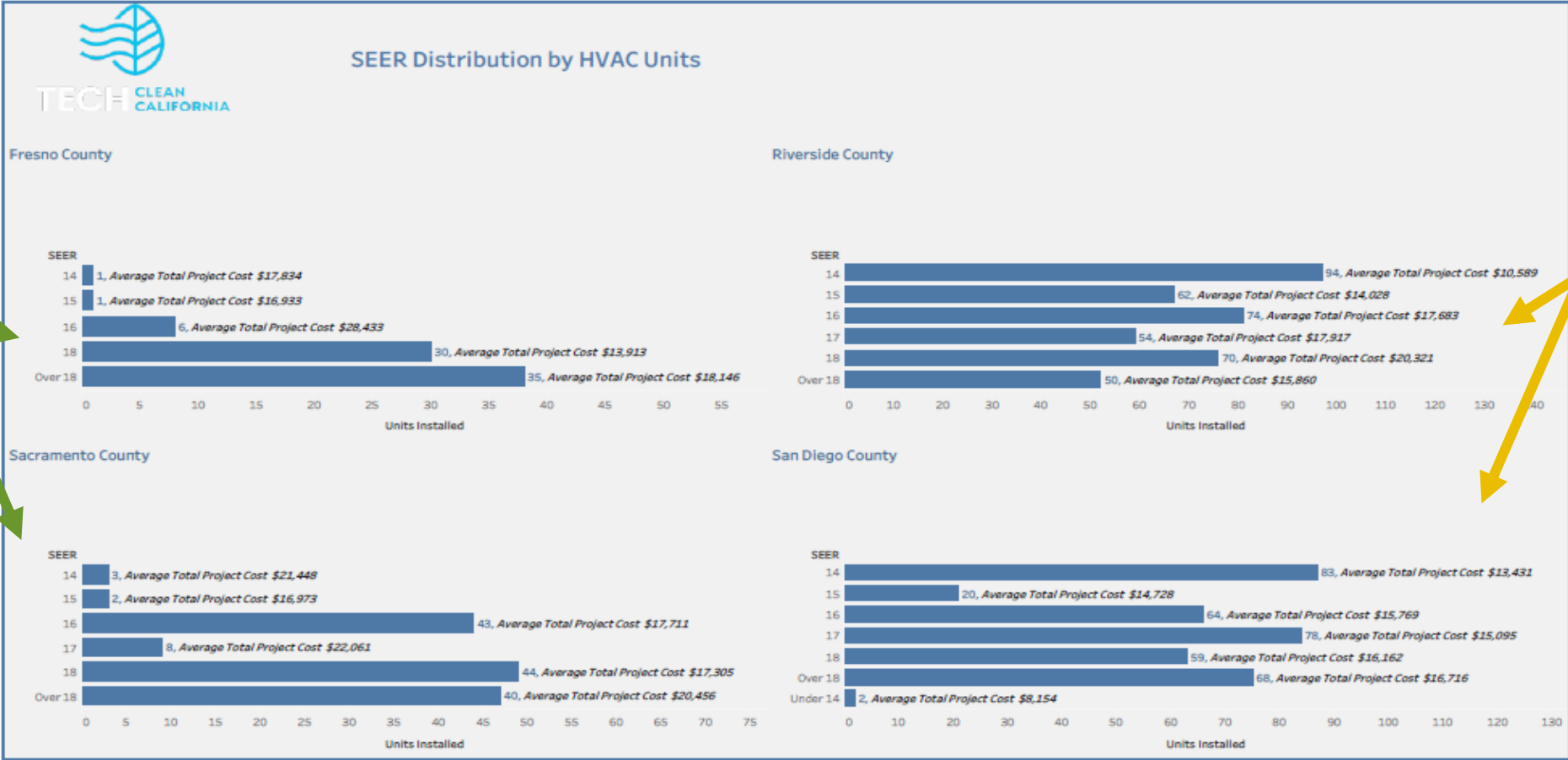
Lessons Learned:

- Incentive layering is critical to get projects to pencil in multi-family. Most projects occurred in regions with layered incentives.

Efficiency and Decarbonization Go Hand in Hand

TECH incentives drive heat pump adoption. Layering partner program incentives drives more efficient products

Local
Incentives for
high efficiency:
< 5% below
SEER 16



No local
incentives for
high efficiency:
25%+ below
SEER 16

Lesson: Every program player has an important role, and it often works best when multiple incentive programs layer to target different resources (such as GHGs and efficiency)

3 Consumer Engagement

A woman with short brown hair, wearing a red top, is looking upwards with a slight smile. She is holding a yellow mug. The background is a kitchen with white cabinets and a range hood. The image is dimmed to serve as a background for text.

For Everyone

Find out why electric may be right for you.

[DISCOVER →](#)

A man with grey hair, wearing a plaid shirt and a dark apron, is working on a kitchen appliance, possibly a range hood. He is looking down at his work. The background is a kitchen with white cabinets. The image is dimmed to serve as a background for text.

For Contractors

Get ahead with clean energy home installations.

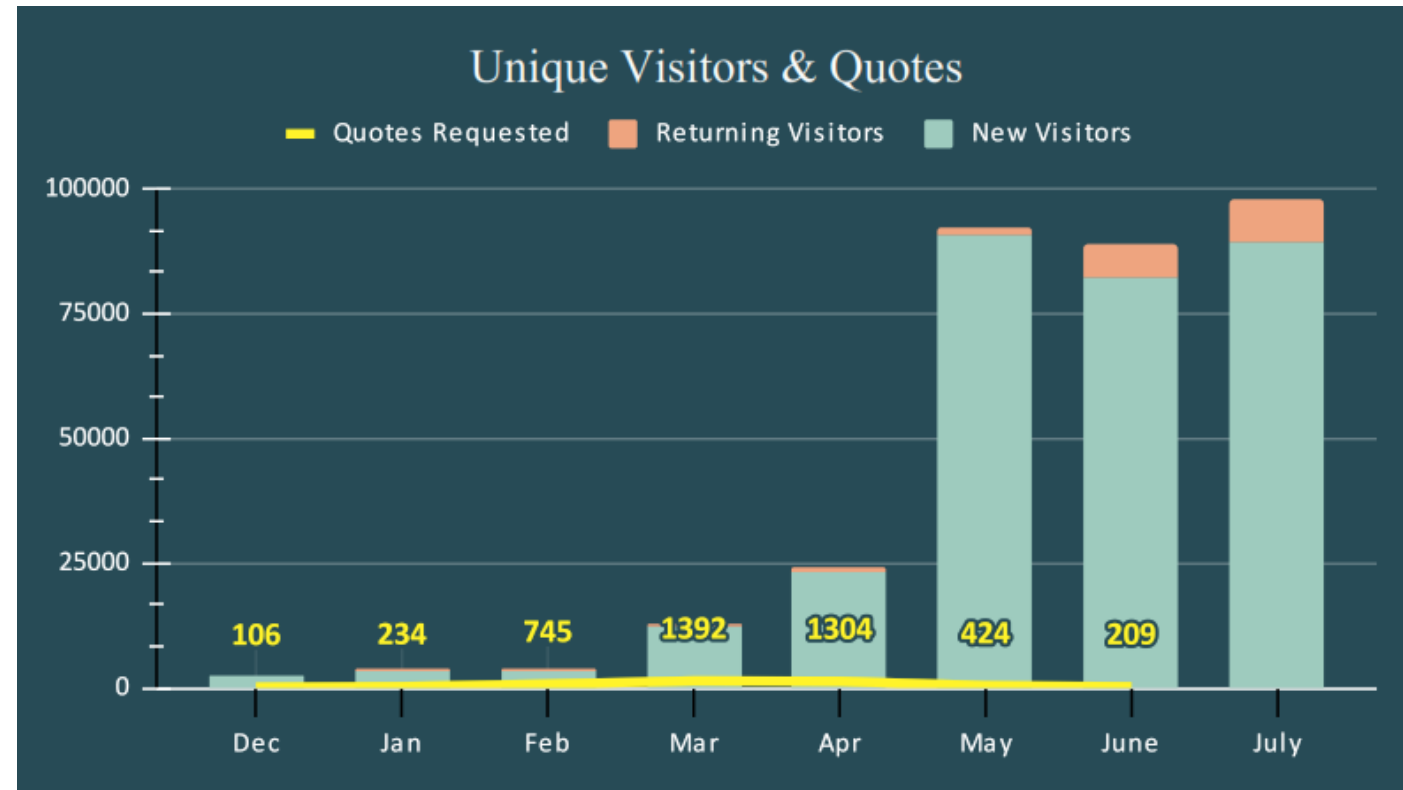
[FIND RESOURCES →](#)

Building Awareness



THE SWITCH IS ON

- **Educating**
 - Website Traffic
 - Emails
 - Ambassadors
- **Inspiring**
 - Articles
 - Social Media
 - Ambassadors
- **Switching Support**
 - Incentive Finder
 - Find a Contractor
 - Financing Options



Lesson: Combination of targeted engagement and incentives can help drive adoption.

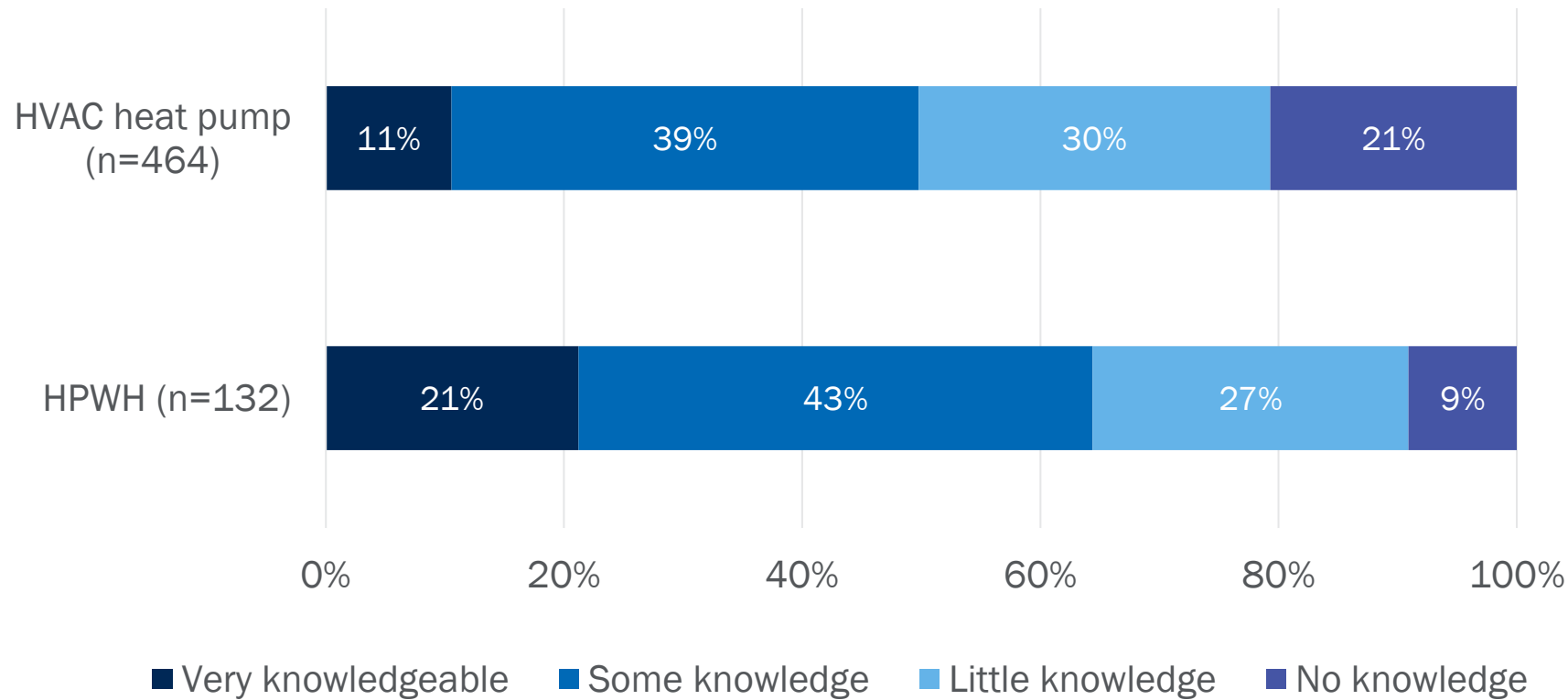
Motivations for Installation

- HVAC more likely looking to **replace old equipment** that was functioning poorly or not at all
- HPWH more likely to be **exploring new options** while their existing equipment was still functioning well
- HPWH more likely to contact contractors to electrify or **reduce the carbon footprint** of their homes

| Reasons for Reaching out to Contractor | HVAC Heat Pump Customers (n=464) | Heat Pump Water Heater Customers (n=132) |
|--|----------------------------------|--|
| My existing equipment was old or not functioning well | 50% | 24% |
| My existing equipment was broken, and I needed to replace it | 20% | 20% |
| My existing equipment was functioning, but I wanted to explore options for new equipment | 18% | 36% |
| I was doing an addition and needed to add new equipment | 4% | 1% |
| Wanted to remove fossil fuels/reduce carbon footprint/ electrify home | 1% | 12% |
| Other | 7% | 7% |

Customer Knowledge of Measures Varied

Half of HVAC heat pump homeowners had at least **some knowledge** of their equipment, compared to two-thirds of HPWH heat pump respondents.



The TECH incentive was influential

Financing

A minority financed their project

- One-quarter of HVAC customers used financing
- Fewer (9%) HPWH customers financed their project



Incentive

For **93%** (555 of 596), the incentive was at least somewhat important in their decision to get the heat pump

- **39%** of HVAC customers (167 of 430) were either unlikely or would not have purchased a heat pump without the incentive
- **59%** of HPWH customers (77 of 125) felt the same way



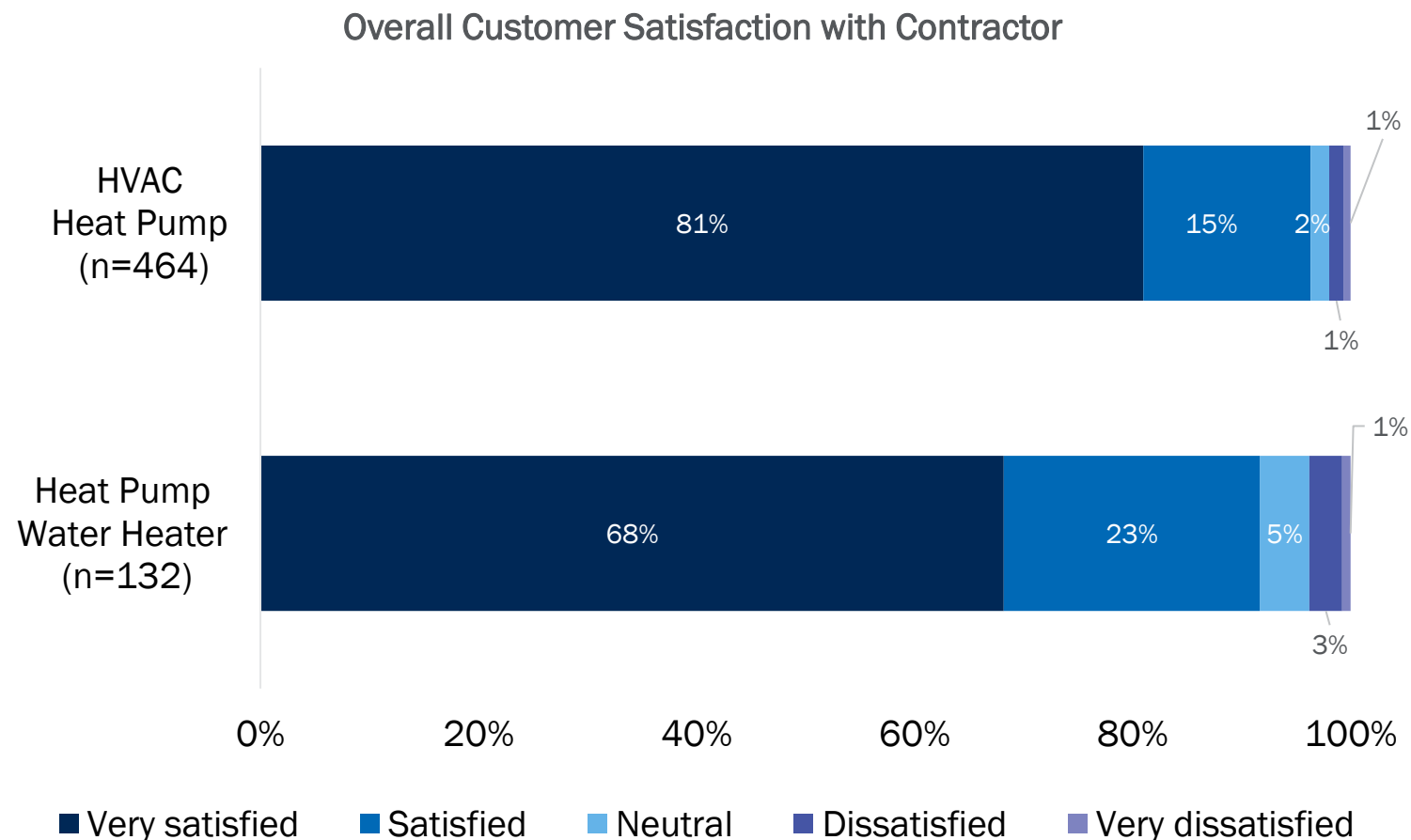
Customer Generally Very Satisfied with Contractors



Fewer than 5% of respondents were dissatisfied or very dissatisfied



Greater satisfaction with **HVAC contractor (96%)** than HPWH contractor (91%)

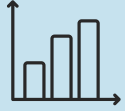


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Pilots & Quick Start Grants

Regional pilots testing scalable solutions to market barriers, and Quick Start Grants for strategically important installations that will help scale adoption.

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Pilot Spotlight: Inclusive Utility Investment Program

Objective: Expand customer access to up-front capital.

Q1 2020: Tariffed on-bill financing whitepaper published.

Q4 2021: Stakeholder workshops to inform program design.

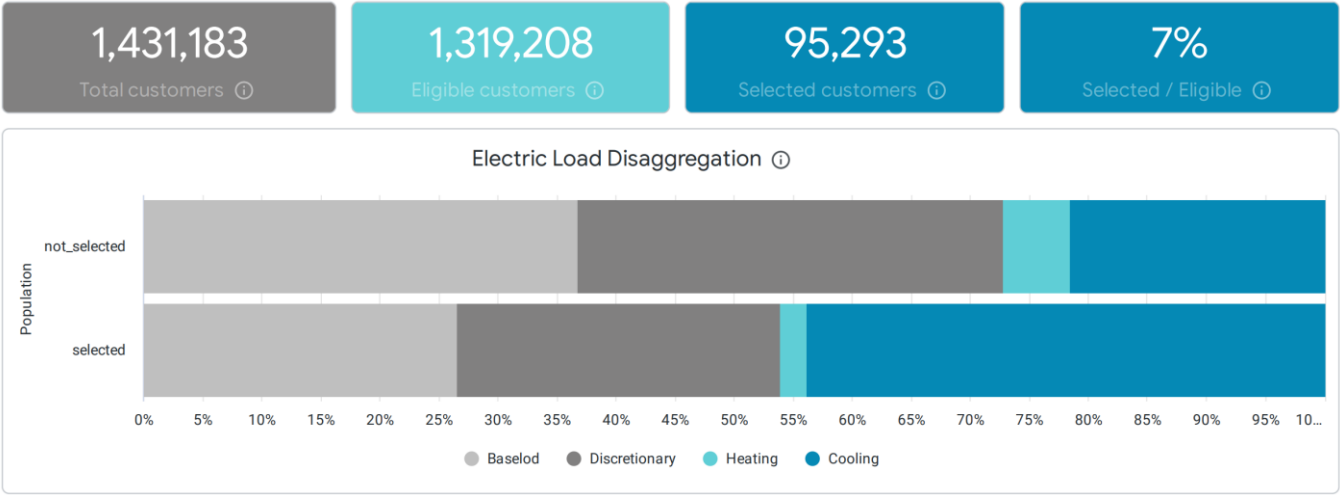
Q1 2022: Draft program design published and available for feedback

Q2 2022: Proposal for pilot with Silicon Valley Clean Energy to CPUC Clean Energy Finance Proceeding:

- Install 500 HPWH and 500 HP HVAC systems in high energy use households
- Approval expected in November 2022

Pilot Spotlight: Customer Targeting

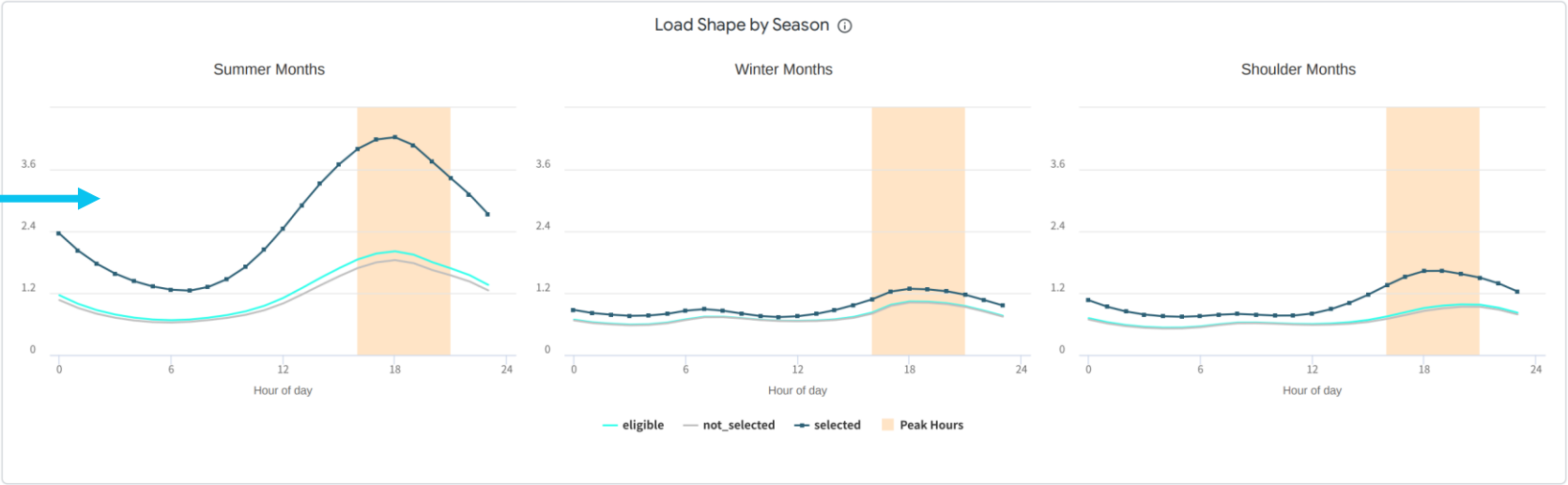
Preliminary results for a sample of 1.3 million single family electric meters in SCE territory



These customers have particularly high cooling burdens (2x average)

These same customers also have ~2x higher peak demand.

Next step is to conduct targeted interventions to identify and convert high propensity candidates into customers



Quick Start Grants: 2022 Projects

Over 70% of projects support low-income and/or disadvantaged communities



Enabling Faster Installations

Barnett Plumbing, Loaner Water Heaters for Emergency Fuel-Switching

Small Planet Supply, Streamlined central HPWH install for multi-family

New Buildings Institute, 120V HPWH Field Test

IHACI, Virtual Technician Software Platform

Making Programs More Inclusive

Redwood Coast Energy Authority, Air Source Heat Pump Incentives for Unregulated Fuel Customers

Franklin Energy and MCE, Augmentation of Income-Qualified Electrification Program

Reducing Energy Costs for Low-Income Customers

The Energy Coalition, Basset Avocado Heights Advanced Energy Community HPWH

AESC, Interactive Impacts of HPWH in Manufactured and Mobile Homes

Innovation for Hard-to-Reach Housing

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

Revalue, Green and Healthy Homes

USGBC-LA, Electrification in Green and Affordable Homes Program

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Informing the Long-Term Building Decarbonization Framework

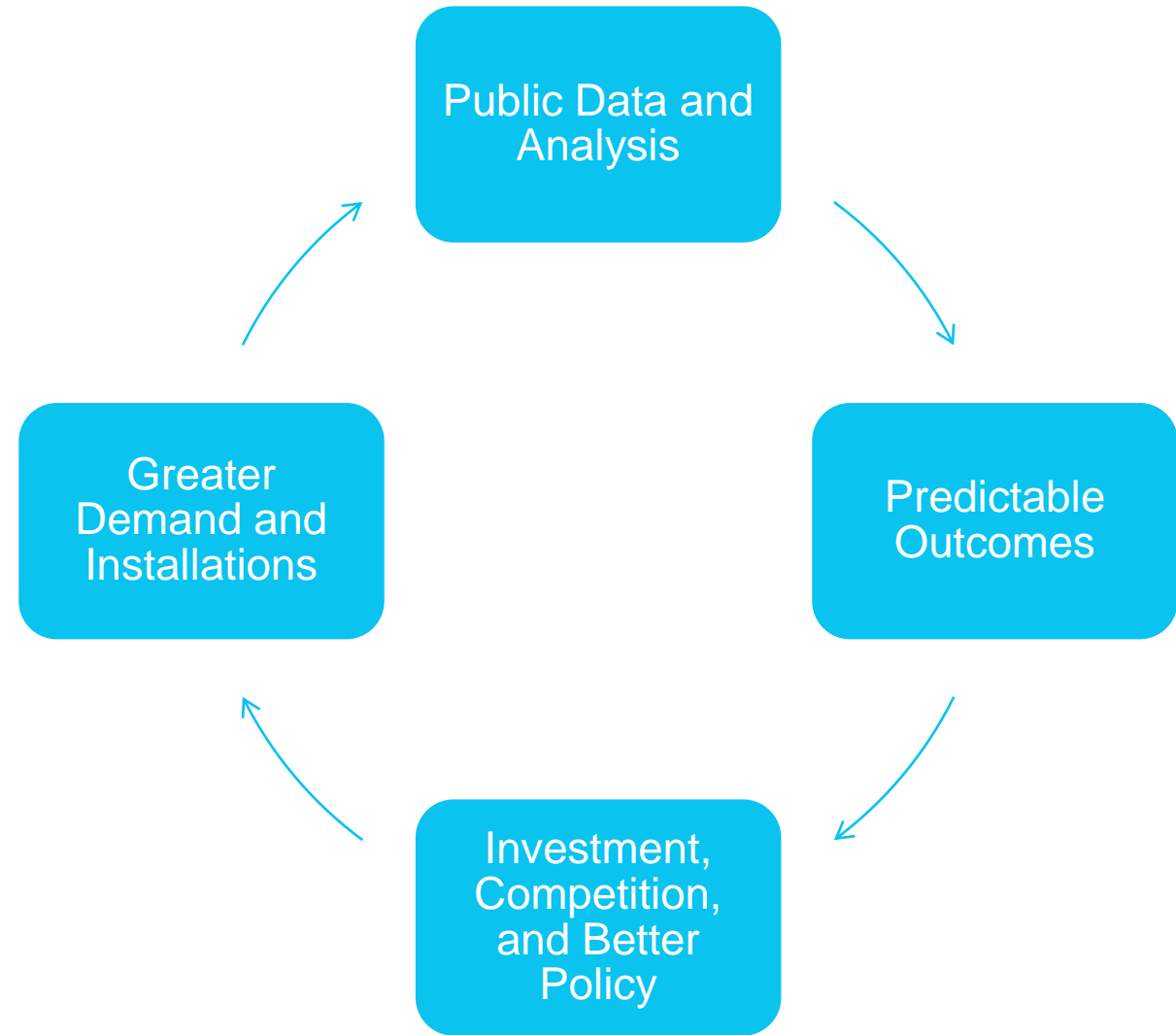
Gather, combine, and publish critical data to inform future programs and policies

Why Publish Heat Pump Data?

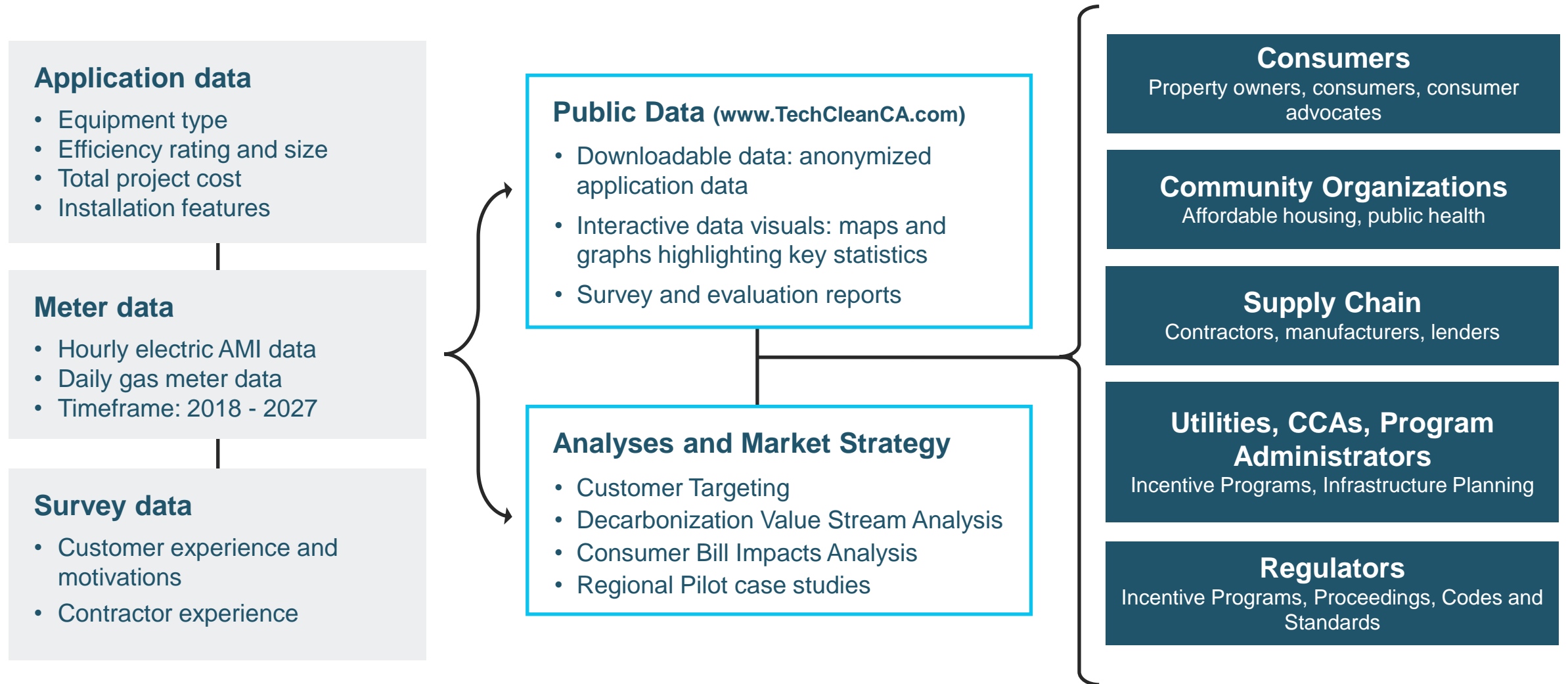
California, other states and the Federal Government have set important decarbonization targets and are planning unprecedented investments.

“If you can’t measure it, you can’t improve it.”
- Peter Drucker

To best deploy decarbonization investments and measure their impacts, we need robust data collection, analysis, and reporting.



How TECH data can inform building decarbonization decisions



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Thank You

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