PENINSULA CLEAN ENERGY

2035 Decarbonization Feasibility & Plan

C/CAG Resource Management and Climate Protection Committee

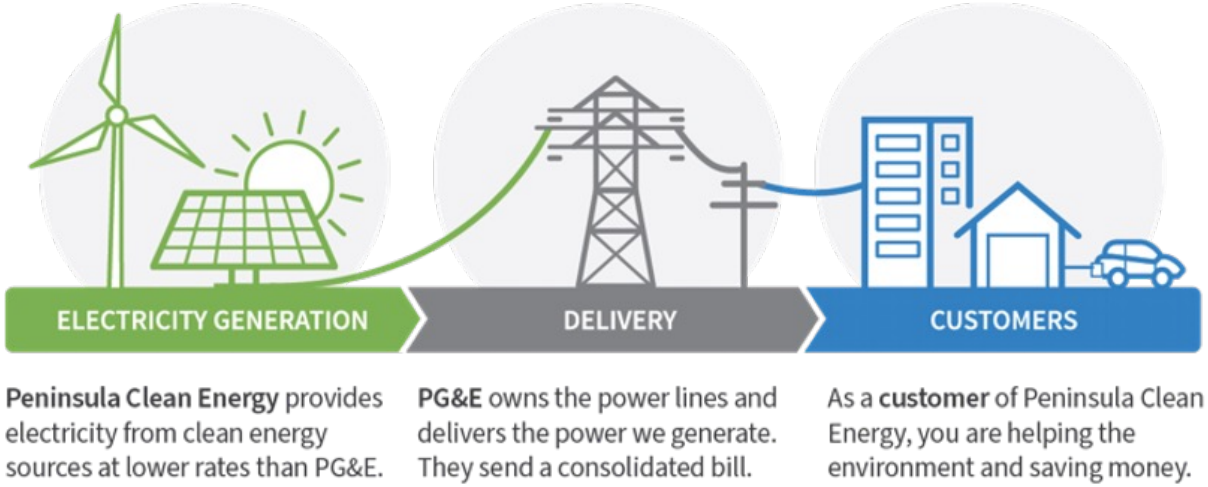
November 16, 2022

Peninsula Clean Energy

The not for profit locally-led electricity provider for San Mateo County and Los Banos.

Mission: To reduce greenhouse gas emissions by expanding access to sustainable and affordable energy solutions

How it works



San Mateo County continues to take action on climate change while saving money!

PENINSULA CLEAN ENERGY

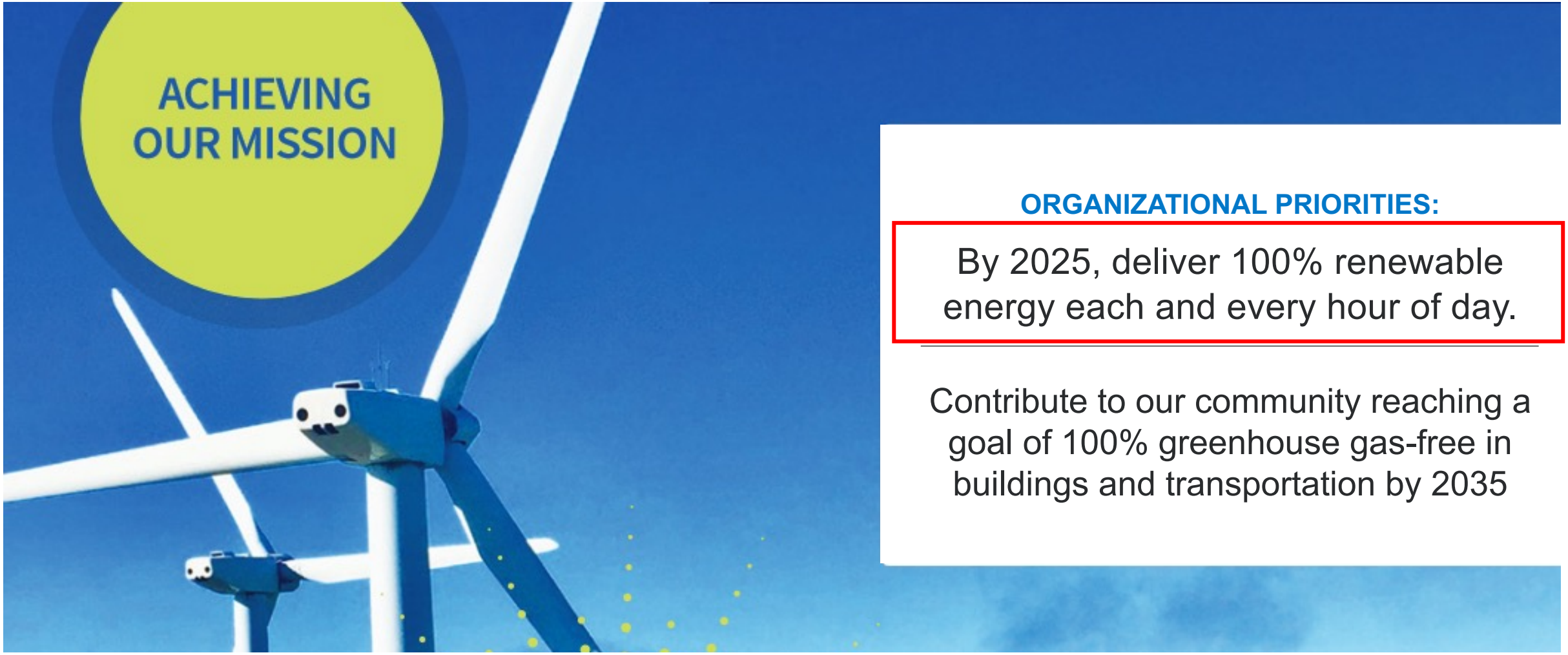
$90M in savings

for San Mateo County customers since 2016

98% reduction

in greenhouse gas emissions from electricity compared to 2016

Strategic Plan



ORGANIZATIONAL PRIORITIES:

By 2025, deliver 100% renewable energy each and every hour of day.

Contribute to our community reaching a goal of 100% greenhouse gas-free in buildings and transportation by 2035

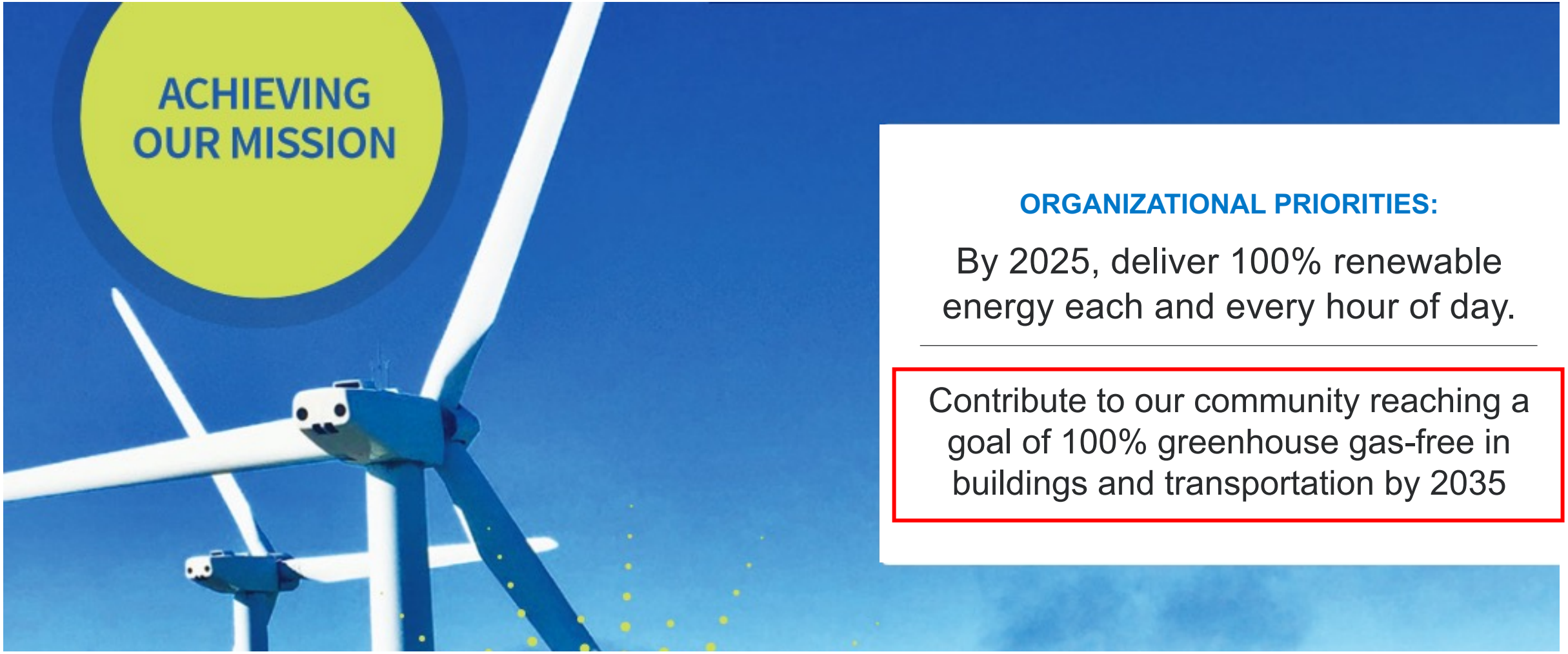
Clean energy – 50% renewable, 100% clean

Renewable: solar, wind, geothermal, small hydropower
Clean: large hydropower

Our 24/7 renewable power goal

Cost-effectively deliver 100% renewable energy in every hour of every day for our 310,000+ customers by 2025

Strategic Plan



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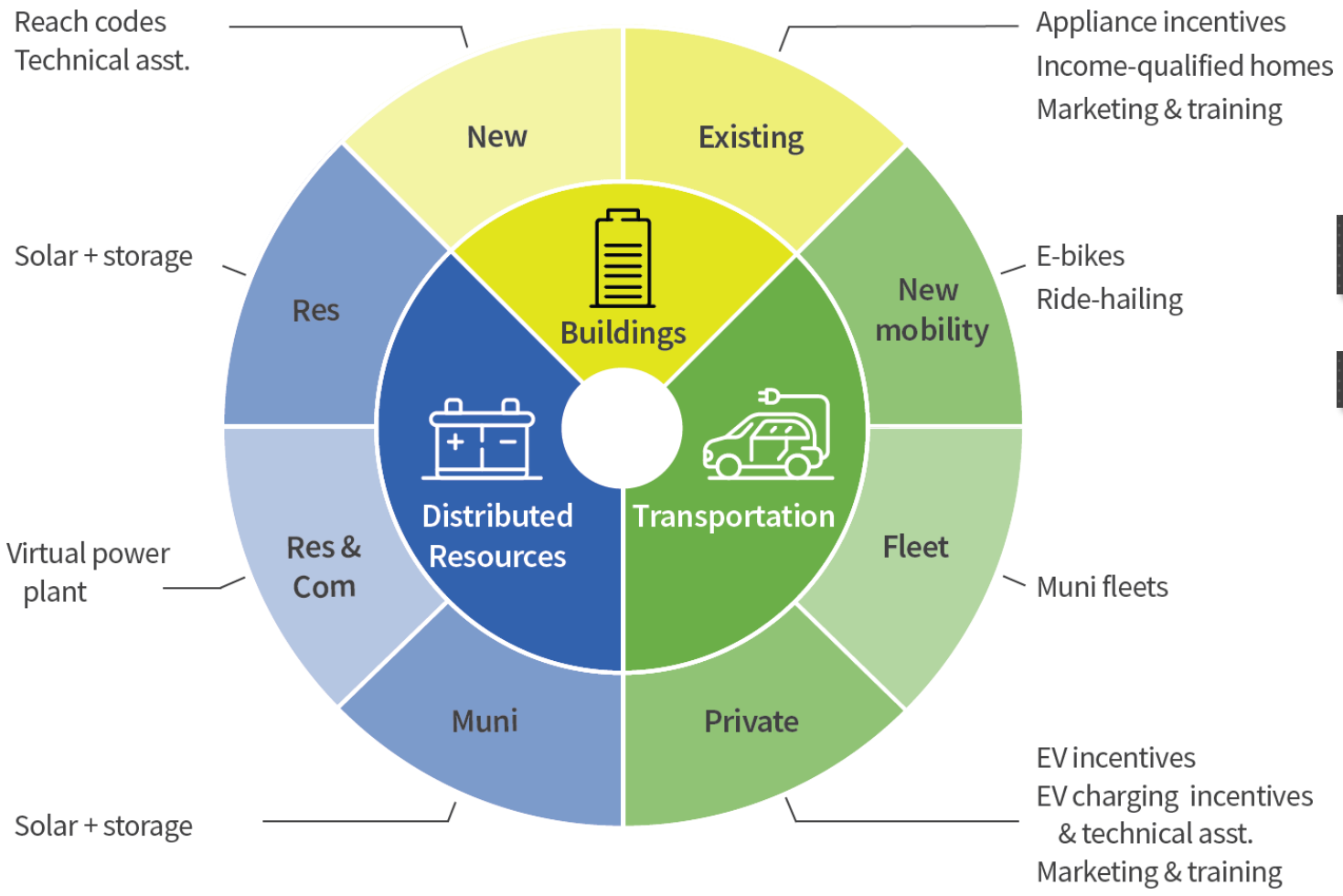
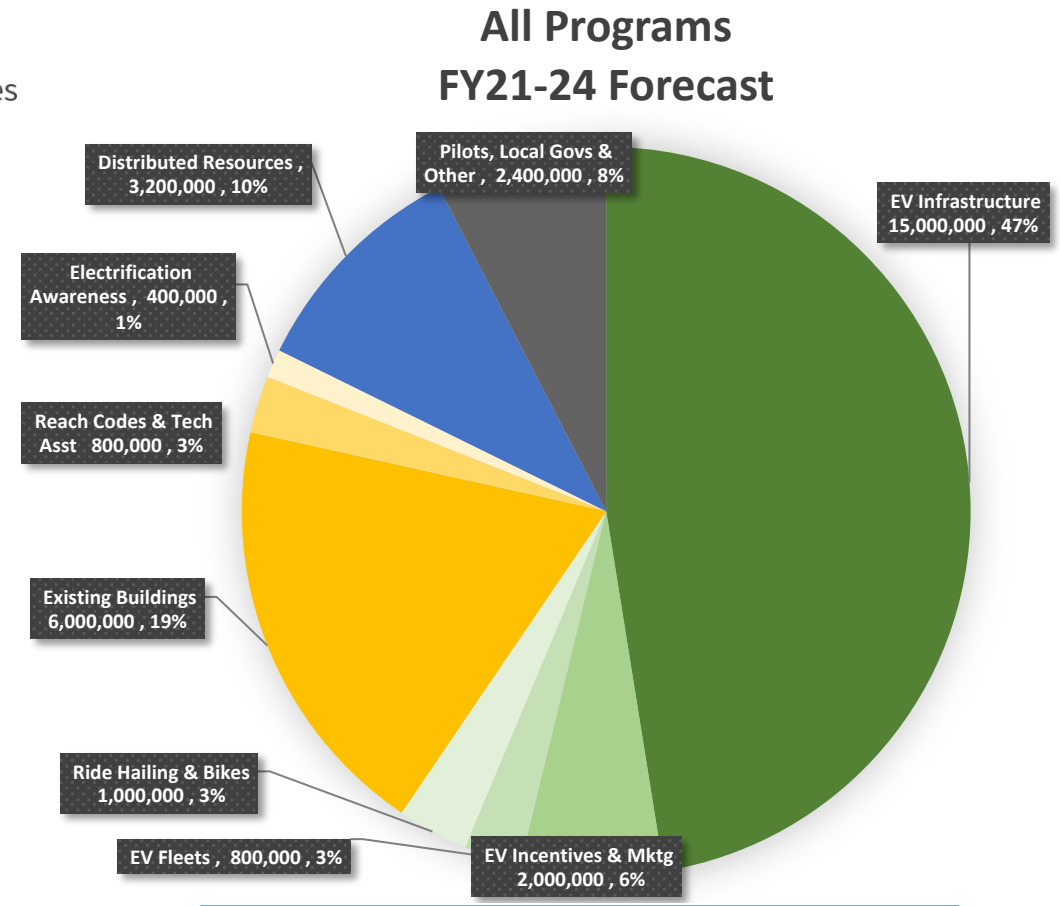
Programs Portfolio



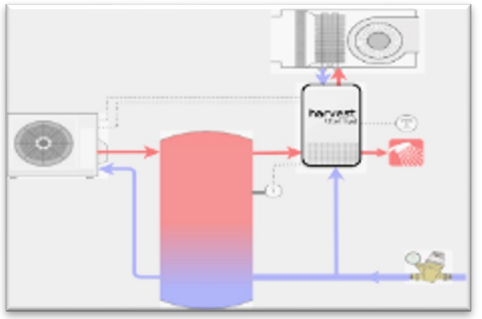


~$30M Budget Forecast FY21-24
(excludes capital expenses and revenues)

Highlights #1

1. Reach Codes: 19 agencies in SM County
   - Project accounts for over half the codes in CA
   - Major innovation in building and EV code; moved state codes
   - 90,000 MT CO2 over 10 years (equivalent to 10M gallons of gas)

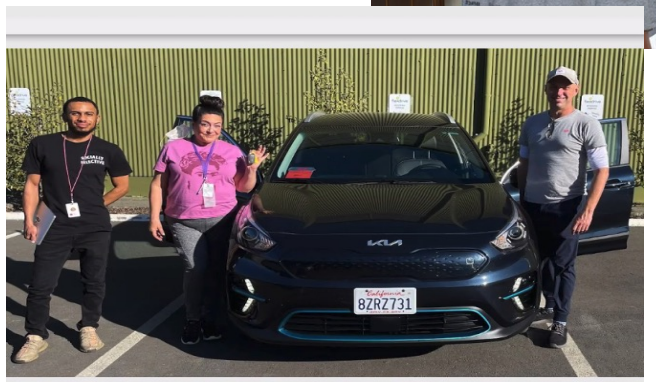
2. Electric Appliances: Over 370 to-date 2021-22
   - Includes ~40% of heat pump water heaters in the Bay Area



3. EV Charging: 271 ports installed
   - Innovation in technical methods, no cost technical assistance
   - Targeting multi-family properties – high need

Highlights – Underserved Communities

1. Electric Vehicles: 173 vehicles (income qual.)
   - $1.8 million in savings over 10 years
   - 9,000 MT CO2 over 10 years
2. Home Upgrade: 61 homes completed
   - Home repairs plus electrification
   - Target: 200 homes
3. Ride-hailing EVs: 2.2 million miles completed
   - 100 EVs with Lyft, 250,000 passengers
   - Ave. 120 mi/day: GHG benefit, driver income

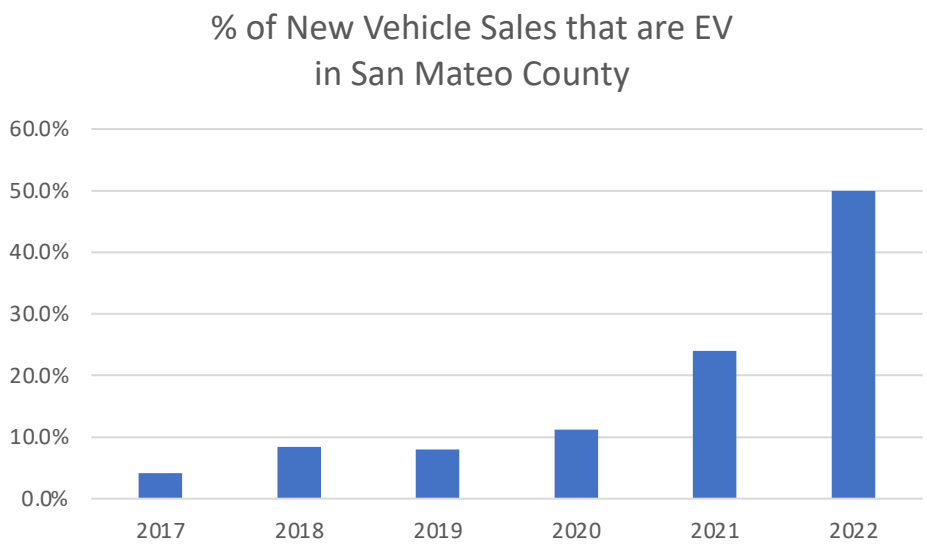


The 1st Renter: Vikki

- Lyft driver w/ over 11k rides
- Previous Flexdrive hybrid renter

EV “Hockey Stick”

- 2022: **50%** of new vehicle sales are EV
  - 2021: Nearly 25% of sales
  - 48k EVs cumulative sales
- Automaker commitments
  - All major automakers – major rollouts



Project Objectives & Scope

Plan Must Address Critical Challenges

1. Building public awareness and motivating adoption
2. Making it easy to take action
3. Accessing the capital to enable action

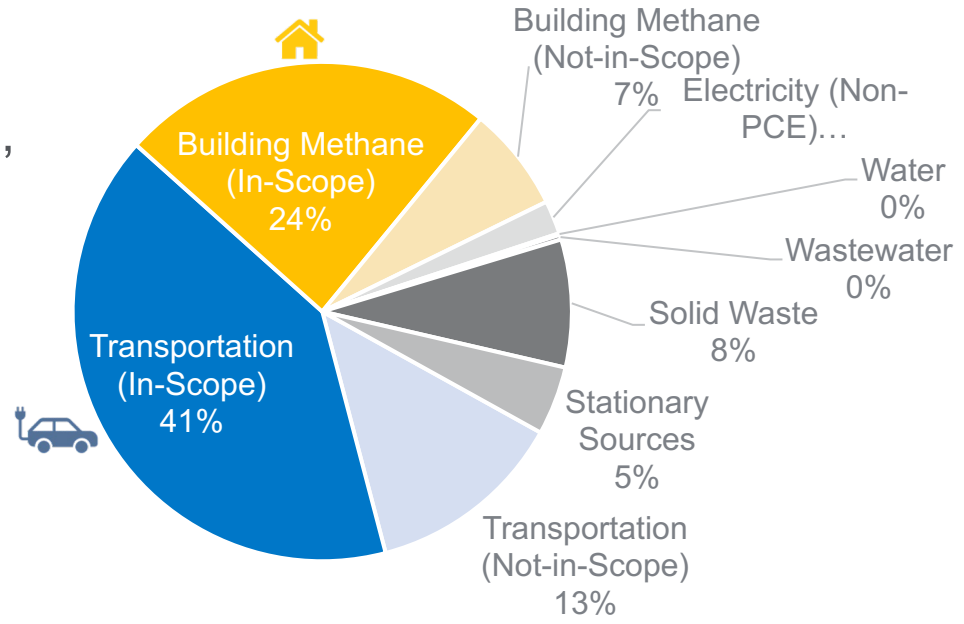
2035 Decarbonization Plan Objectives

1. Define **PCE scope** and **market conditions** anticipated
2. Determine **costs** of decarbonization within target segments
3. Specify **investment strategy** and **program concepts**
4. **Assess feasibility** of 100% target
5. Specify **marketing and policy** needs
6. Produce concrete program **roadmap to implement** and achieve maximum decarbonization

PCE 2035 Plan Scope

- Primary Scope
  - Transportation
    - private passenger, local gov & small commercial fleets,
    - ride-hailing, alternative mobility
  - Buildings
    - "small" residential (single family & small multifamily),
    - office, small commercial

San Mateo Countywide Greenhouse Gas Emissions,



- Not in scope, or limited* (others to lead)
  - Transportation: heavy-duty vehicles, off-road
  - Buildings: industrial, large commercial*, large multifamily*
  - Non-energy: land-use, compost, stationary sources, landfills, embodied carbon
  - Adaptation, restoration

Note: Current analysis is based on SMC data; Los Banos data to be included as it becomes available

Market Conditions

Assess implications of anticipated technology and economic conditions

Market Conditions: How the analysis is done

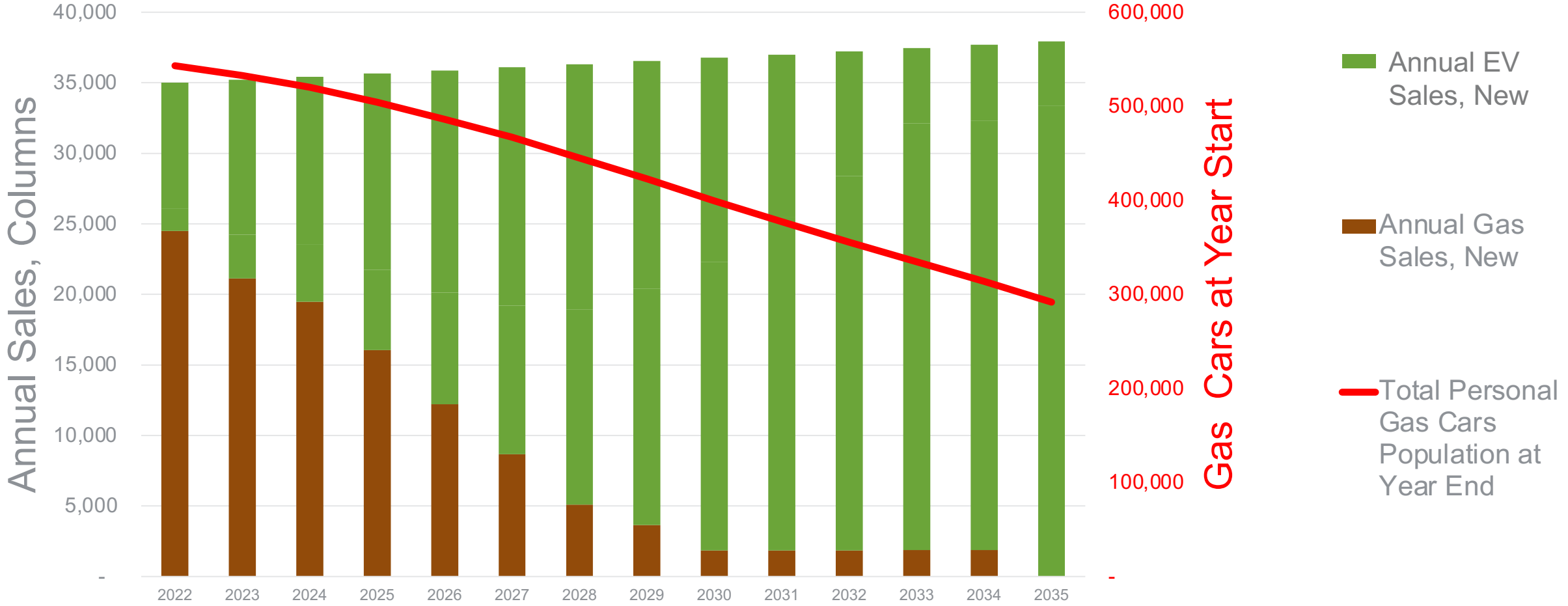
Market Conditions

- Macroeconomic conditions
- Technology developments
- Cost changes (products, methods, rates)
- Available or expected policy support

(no PCE action)

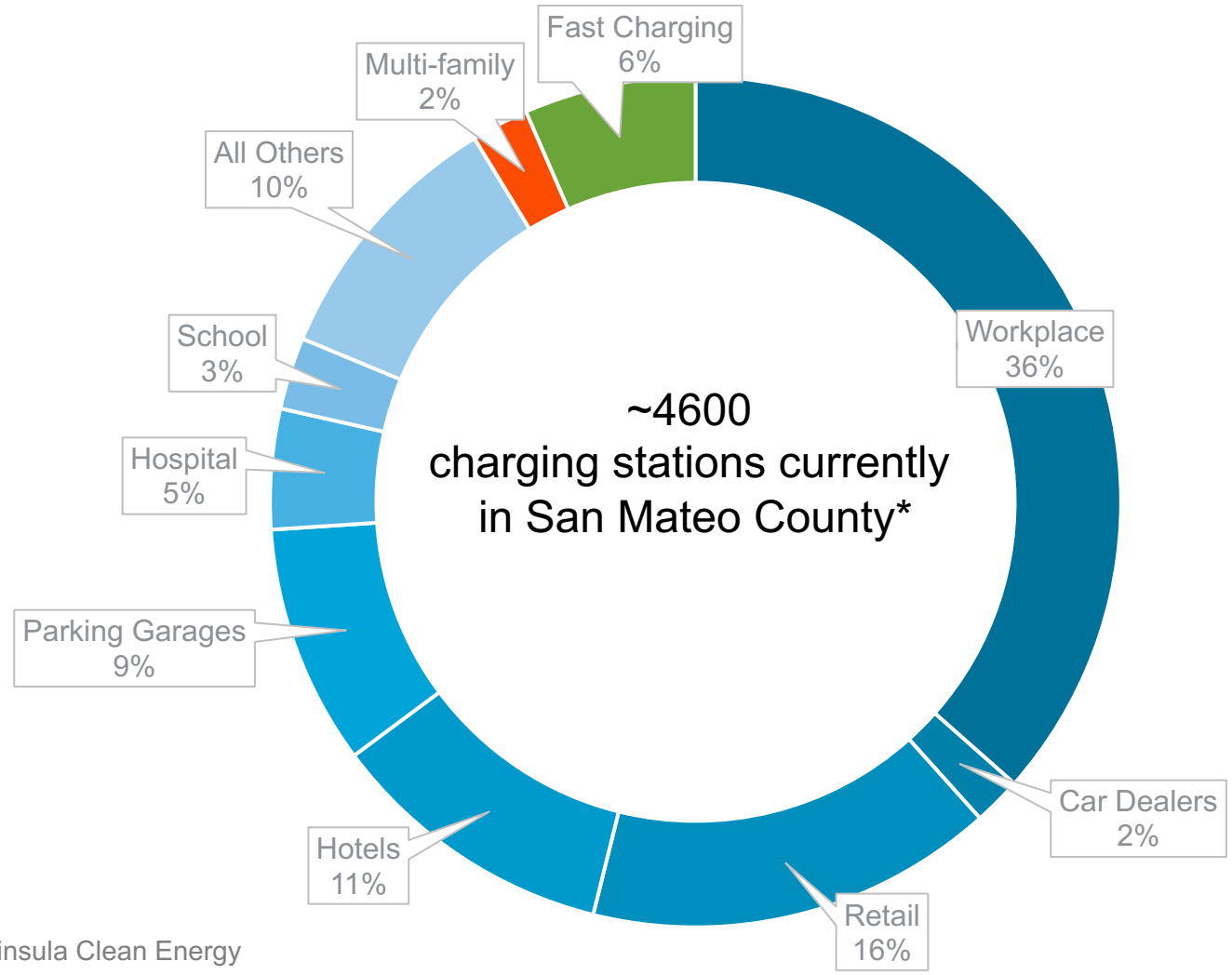
"Business-as-usual" adoption forecasts

Transportation: EV Growth for New Vehicle Sales



Current EV Charging Distribution

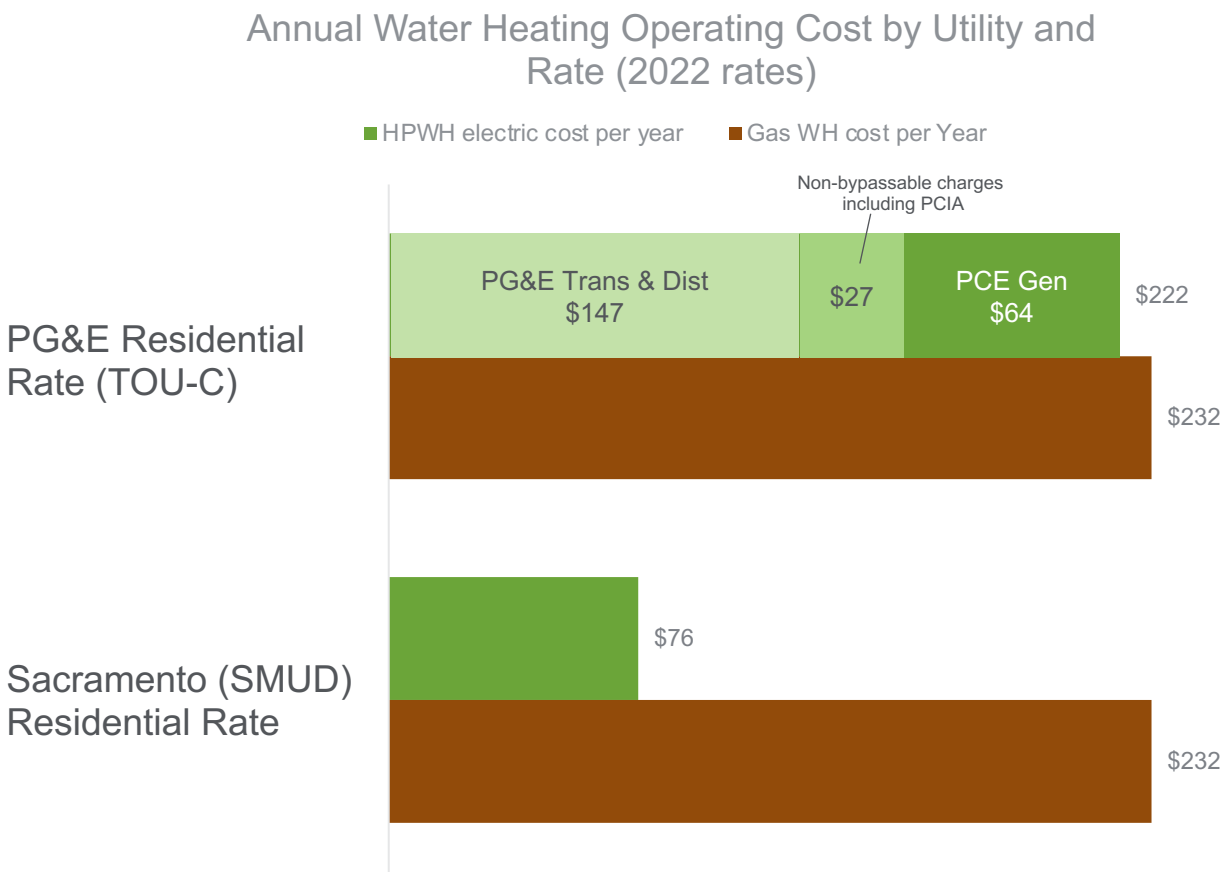
EV Chargers by Type and Site



- Min. need to support all-electric fleet, ~70k chargers (CEC**)
- Major need in multi-family housing
- 80% of EV charging happens at home

** data quality is poor for workplace charging and multifamily so counts may be higher*
*** California Energy Commission adapted estimate*

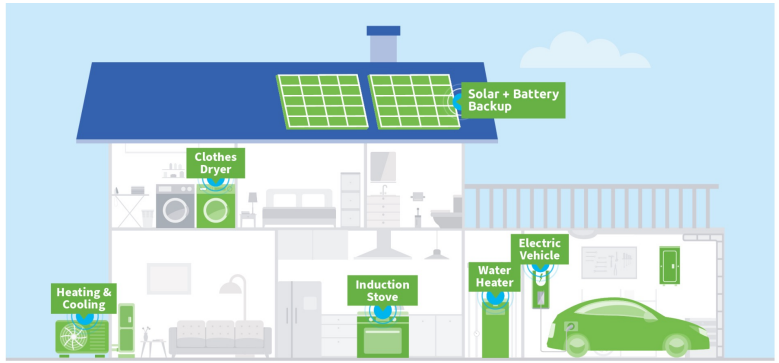
Impact of Utility Rates



- Residential rates in PG&E territory are very high
- Effectively eliminates economic benefit of electrification
- Unless rate structures shift

As of June 2022

Cost of home upgrade (current)



The most common single-family home in SM County has:

- Gas water heating, tank-type
- Gas space heating, without air conditioning
- Gas cooktop
- Electric drying

The cost to electrify will be $28,000, an increased cost to the homeowner of $18,600 versus typical gas replacement costs.

	Electrification Cost	Gas Equipment Cost
Water Heating (includes 240V circuit)	$6,100	$2,000
Space Heating	$20,700	$6,132
Cooking	$1,098	$1,155
Clothes Drying	$925	$925
Total	$28,823	$9,057
Panel, if required	$3,700	
Total non-optimized cost	$32,523	

PCE Analysis: Conclusions

- High electric rates are major obstacle producing poor economics for electrification.
- Potential CARB and AQMD policies implemented in 2027-2031 would have enormous impact.
- Low-income segment challenge: High percentage of small residential units (~20%) owned by very low-income residents creates a challenge to self-fund electrification.
- Charging at multi-family: Virtually none exist currently, reach codes help but substantial gap remains affecting ~28% of population, mostly renters, many low income. Overall cost gap for all EV charging ~$400M.
- Limited supply and slow turnover: New gas car sales will likely end before 2035 but used cars will electrify slowly; likely supply constrained

Strategy

How much can be done with resources available

PCE Financial Strategy – Key Principles

1. Leverage **market forces, innovation and policy** support for cost-effective GHG reduction measures

2. Where practical, leverage other/existing programs and **fill gaps**

3. Provide **higher incentives early**, better than cost parity where possible, then reduce incentives as market matures and costs decline

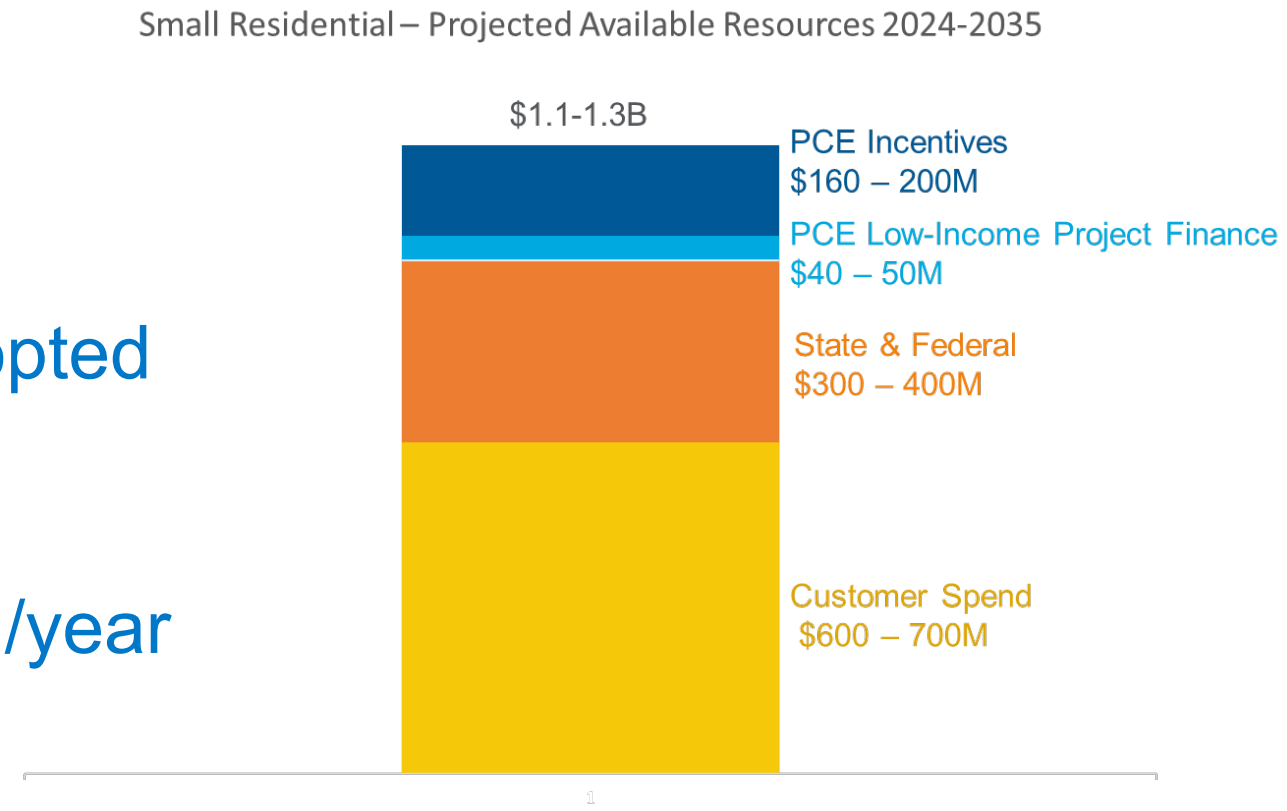
4. Offer **more support to those with less** capacity to bear costs

5. Mobilize traditional and innovative **finance solutions for scale**

6. Target and fund programs to **enable key policy** adoption for required action and market transformation

Sources of Funds

- State & Federal Funding
  - Building: $27-33M/year
  - Transportation: $8-10M/year
- Existing building reach codes adopted with increasing efficacy over time
- PCE investment: grows 3.5 to 5%/year
- DR value: $4-5M/year



Decarbonization Programs

1. **Building Electrification**
   - Flexible incentives
   - High touch support
   - Links to finance
2. **Reach Codes & Other Local Policies**
   - Continue new construction
   - Support existing buildings
   - Ensure programs support policies
3. **Transportation Electrification**
   - Vehicle Incentives
   - EV Charging (esp. MUD)
   - Fleets & Alternative Mobility
4. **PCE as Conduit to Capital**
   - On-Bill Finance
   - Information Conduit & Credit Enhancements
   - Project Finance

2035 PCE Decarb Plan - Feasibility Conclusions

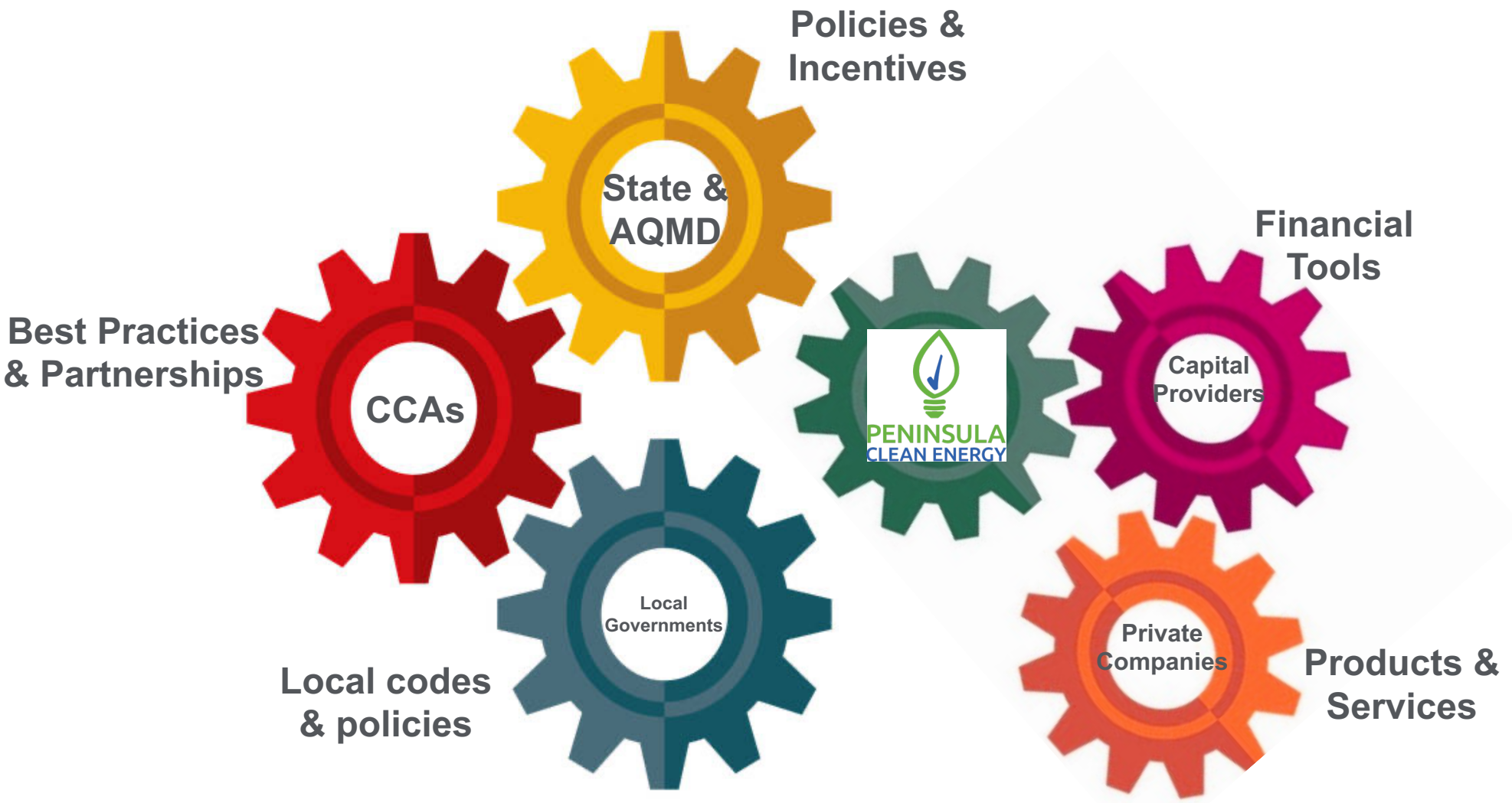
Given current market conditions, funding and financing availability, current rate structures and policy status, Peninsula Clean Energy can achieve significant progress but not 100% GHG reduction by 2035

- What PCE can achieve:
  - **Private Vehicles: ~50-60% vehicles electrified, ~70-80% EV port need (not DCFC)**
  - **Small Residential: ~25-35% homes electrified**
  - Assuming stable external funds, aggressive finance, and modest PCE budget growth
  - Assumes local governments continue adopting reach codes
  - All resources must be leveraged (incentives, DR value, finance, etc.)
  - Assuming no rate reform (identified as a major policy need)

Scaling & Partnerships

We're Not In This Alone

Acting with Others



C/CAG City/County Association of Governments of San Mateo County

OFFICE OF SUSTAINABILITY COUNTY OF SAN MATEO

CALIFORNIA ENERGY COMMISSION

TECH CLEAN CALIFORNIA

BAYREN Local Governments Empowering Our Communities

enel x

harvest thermal

EAST BAY COMMUNITY ENERGY

SILICON VALLEY CLEAN ENERGY

Next Up:
Capital Providers

SMC Carbon Neutrality Action Plan

Intentional coalition of three main countywide Board organizations towards carbon neutrality

C/CAG City/County Association of Governments of San Mateo County

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PENINSULA CLEAN ENERGY

Objectives

- Policy advocacy
- State and Federal funding
- Communications
- Standardized metrics & timelines
- Sharing analysis and equity strategy
- Coordinated implementation

Take-aways & Next Steps

Final Take-aways

1. High utility rates negatively impact BE adoption
   - Need better rate design
2. Importance of designing Buildings program to enable policy requirements
   - Programs support reach codes, AQMD and CARB policies
3. Low-income segment challenge
   - Essential to innovate on finance structures
4. Not enough used EVs to close the gap on existing vehicles
   - Land-use and mode shift remain very important
5. High cost of building electrification and insufficient resources
   - Need to drive down costs
6. Very significant value of EV load shifting
   - Must capture value of grid services

Next Steps

1. Develop final elements of plan including:
   - Program roadmap
   - Marketing plan
   - Partners
   - Metrics
   - Policy platform

2. Return to the PCE Board in Q1 2023

Backup Slides

Program Concepts Detail

Buildings Electrification

1. **Flexible Incentives**
   - All measures, incl. prewiring and panels
   - Broader building segments
   - Integrated load shaping & solar+storage options
2. **High touch support**
   - Advanced “right-sizing” design
   - One-stop shop, hotline assist, turnkey option
   - Procurement aggregation to lower costs
   - Greater contractor support
3. **Links to Finance**
   - Specific linkages by customer segment

Reach Codes and Other Local Policies

1. **Continue to Support New Construction**
   - Re-adopt and increase jurisdictions
   - Remove exemptions and expand building types
   - Progressive increase in EV charging capacity as needed
2. **Support Existing Building Policy**
   - Adopt no-cost and low-cost measures first
   - Adopt new measures as programs and funding become available
   - Increase city count over time
3. **Build Programs to Support Policy**
   - To support local reach code adoption
   - To support BAAQMD goals
   - Work with state and federal agencies to leverage funding streams

Transportation Electrification

1. **Vehicle Incentives**
   - Low income used EV incentives with tech. assistance
   - Integrated load shaping
2. **EV Charging**
   - Technical assistance and incentives for multi-family and public agency parking, “right-sizing” design
   - Incentives in other market segments taper over time
   - Integration with SFH whole-home solutions (and V2H resiliency as appropriate)
   - Contractor training for grid & load mgmt. solutions
3. **Fleets & Alternative Mobility**
   - Local government and small commercial fleet incentives and technical assistance
   - E-bikes and, until state EV requirements come into effect, ride-hailing

PCE as Conduit to Capital

1. **On-bill finance (OBF) from PCE**
   - Limited scale 0% interest credit for any customer
   - Could expand to include third-party capital
2. **Provide customer information on third-party finance**
   - Guidance on consumer credit, including point of sale
3. **Advocate for state credit enhancements**
   - Foster credit enhancements to lower credit cost
4. **Aggregate residential project finance (under study)**
   - Adapted from Government Solar
   - Target lowest income customers without capacity for debt or added cost
   - PCE fully funds installations using external capital, repays capital under long term plan
   - Customers assume no debt or added expense