How CCAs are Plugging the Equity Gap in EV Charging Infrastructure
CalCCA Webinar Team

Leora Broydo Vestel
Director of Communications

Jackson McDonough
Communications Associate
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CALPINE

CALPINE ENERGY SOLUTIONS
Meet our Speakers

Peter Ambiel
Energy Programs Specialist
Peninsula Clean Energy

Sherry Bryan
Program Manager
Ecology Action
Housekeeping

• Webinar is being recorded
• All participants will be in listen-only mode
• Use the Q&A button on your screen to submit questions
• Q&A will begin following presentations
EV Charging in California
Providing greater equity to EV charging
Peninsula Clean Energy

Peninsula Clean Energy is San Mateo County’s not for profit locally-led electricity provider

Mission: To reduce greenhouse gas emissions by expanding access to sustainable and affordable energy solutions
Who is Peter Ambiel?

• Started at Peninsula Clean Energy in 2019
• Tesla, 2015 - 2019
  o Transportation program management
  o EV charging infrastructure program management
    o Covered Northeast, Southeast, Midwest regions installing 2,000+ stations
Transportation Electrification: Economic Opportunity

Gas Vehicles

San Mateo
300M gal gas/yr
$300 million/yr

Electric Vehicles

97%

40-50%

50-60%

$9 million/yr*

$150+ million*

* Excludes indirect investment via taxes
Electric Vehicles Programs at PCE

• Electric vehicle incentives (incl., add’l support for LIC)
• E-bike incentives
• Building Reach codes – Model codes and technical assistance
  o Work with SVCE is responsible for half the reach codes in the state
• EV charging and technical assistance
Charging Levels

**Level 1**
Typical residential application, lowest power draw, longest charge time, charger provided with most vehicles

- **120-volt**
  - 2 miles
  - 30 min

**Level 2**
Typical residential and commercial applications, medium power draw and time to charge

- **240-volt**
  - 10 miles
  - 30 min

**Level 3 – DC Fast Charger**
Typical commercial applications, highest power draw fastest time to charge

- **208-600 volts**
  - 90 miles
  - 30 min
The Need for EV Charging

California’s charging goal: 250,000 EVSE by 2025

Figure 4: Installed and Projected Charger Counts Compared With Charger Needs for 1.5 Million Light-Duty ZEVs in 2025 and 8 Million Light-Duty ZEVs in 2030

- Installed (2020): 70k chargers installed as of late 2020
- Projected (2025): 123k additional installations* by 2025, totalling 193k chargers statewide
- Gap (2025): Net gap of 57k chargers to 250k goal for 2025
- Gap (2030): Net gap of 972k to projected 2030 need of 1,164k chargers

* Based on allocated funding through 2025 as of February 2021

Source: CEC and National Renewable Energy Laboratory
Challenges with EV Charging

• Multifamily access is especially critical
• Principal gating issue is cost
• Level 2 (L2) per port costs:
  o ~$5,000 (MCE) to ~$18,000 (PG&E)
  o Installations are typically overbuilt for daily driving needs
• Major equity implications
Principles & Use Cases

Level 1, Power Management, & DC Fast Charging
Principles for Increasing Charging Equity

- **All multi-family units have electrified space**
- Minimum power threshold of 1.9 kW
- Encourage/support Level 1
- Design all Level 2 ports with Load Management
Level 1 Charging: Dedicated Service/ Lowest Cost

• Level 1 charging meets daily driving needs at the lowest installation cost (~$1,600/ port)
  o ~50% of EVs currently charge with L1 (CARB)
  o 40-50 miles of range per 10-hour overnight charge
  o San Mateo County residents drive ~30 miles/day on average

• Implementing L1 in multifamily dwellings
  o Level 1 installed in assigned parking
  o Power managed Level 2 installed in shared parking

Franklin-Templeton, San Mateo
Level 2 Power Management

Definition: Multiple charging stations share the same electrical circuit

Circuit 40A (32A draw), 240V, 7.68 kW available

Unmanaged EVSE load = 160A, 28.8K (4x oversubscription)

When one EV is actively charging, all circuit power is delivered to that station

Power is divided evenly as additional EVs are actively charging on the same circuit

Minimum of ~60+ miles of range provided with overnight charge at MUDs. Real-world charge will be higher due to power balancing.
Peninsula Clean Energy's EV Charging Infrastructure Program & Strategy

For detailed design principles, case studies, policies: https://www.peninsulacleanenergy.com/ev-technical-resources/
PCE EV Ready Program

Overview:
• $28M+ infrastructure program targeting 3,500 ports installed by 2024
• Supports workplaces, multi-unit dwellings, public agencies

Key Elements
• Free technical assistance to streamline site design, increase port deployment, & improve the customer experience
• EV charging station rebates for Level 1 & Level 2 ports
• Trained network of union contractors
EV Ready Program Strategy & Targets

**Strategy**

- Design EV charging projects with power managed Level 2 & Level 1 charging to increase charging deployment and minimize costs
- Leverage low cost L1 charging for older, smaller MUDs

**Targets**

<table>
<thead>
<tr>
<th>Program Deployment Targets</th>
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</thead>
<tbody>
<tr>
<td>Multi-Family L1</td>
</tr>
<tr>
<td>Multi-Family L2</td>
</tr>
<tr>
<td>Workplace/ Public L2</td>
</tr>
<tr>
<td>DC Fast Charging</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
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Retrofit Case Study: Low Power Cost Savings

Minimum Costs
- Level 1: ~$1,600/port
- Level 2: ~$3,600/port (with power mgmt.)

Cost uncertainty:
- PG&E upgrade costs can vary widely if neighborhood transformer upgrade is required, minimized likelihood with L1

San Mateo Apartments Example (17 ports)

<table>
<thead>
<tr>
<th>Option</th>
<th>EVSE</th>
<th>Installation</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 L2 + 15 L1</td>
<td>$14,500</td>
<td>$76,100</td>
<td>$90,600</td>
</tr>
<tr>
<td>17 L2</td>
<td>$42,500</td>
<td>$209,000*</td>
<td>$251,500+</td>
</tr>
</tbody>
</table>

This project will have an upgraded main panel and new subpanel.

* Includes rough estimate to add new service from PG&E, this would be higher if new transformer is needed.
ACCELERATING EQUITY IN ELECTRIC VEHICLE OWNERSHIP AND CHARGING AT MULTI-FAMILY PROPERTIES
19,000 Commercial Customers

665 MUD Properties

95 Employees

251ST EV Charging Station Installation in Progress

Serving Utilities, National Retail Brands, Governments, Private Sector
EV EQUITY – WHY THE NEED?
Clean transportation is an equity issue!

- Lowest-income earners spend 4X more of their income on gasoline and car maintenance.
- Tailpipe emissions are some of the main sources of pollution in disadvantaged communities.
- Many equity incentive programs exist, but households still face major barriers to access.
The MUD Charging Problem: Market Failure

Approximately 60% of people in the Bay Area live in MUDs but less than 10% of electric vehicles are owned by MUD residents.

MUD Property Owners
- No return on investment
- Large hassle factor
- Multiple misaligned rebates
- Limited available panel capacity

Drivers (tenants)
- 25-35 miles of charge daily
- Certainty of access

EVSPs
- Business models require high throughput
- Focused on higher power EVSP
- Revenue doesn’t justify investment

Funders
- Solution must meet policy criteria
- Need a price point that can be rolled out in mass
Key Findings from EBCE Market Study

18. BUDGET - What amount would your organization be willing to cost share for EV charging station installation per property without going into a new budget cycle?

More Details

- $0 - There is no budget availbl... 19
- $0-$1,000 1
- $1,000-$2,000 1
- $2,000-$3,000 1
- $3,000-$4,000 0
- $4,000-$5,000 1
- $5,000-$10,000 0
- More than $10,000 0
- Don't know 10
- Other 4
Key Findings from EBCE Market Study
Only 48% of MUD properties had at least 60 amps of house panel capacity. The majority had less power or needed a panel upgrade. Power at house panel in “competition” with other electrification programs for MUDs (Heat Pump Water Heaters)
Summary of Key Findings from EBCE Study

- 60% of MUD operators surveyed have $0 budget for EVSE
- Tenant requests for access to EV Charging are higher in moderate and higher income MUDs.
- Affordable housing MUD operators that have installed EVSE for reach codes report under-utilization.
- Affordable housing MUD operators need to charge by kWh – not a rent adder
- Larger MUD operators prefer 3rd party payment/maintenance system
- MUD operators need more info on maintenance costs before agreeing to install EVSE.

More at https://ebce.org/community-innovation-grants/
How can CCAs Increase Equity of Opportunity for EV Ownership?

• Programmatic Solutions – Turn-Key Direct Installation for MUDs
• Equity and equity - Include properties with fewer than 20 units
• Address "harder to reach" properties – Affordable and moderate-income MUDs - regardless of geography
• Pair EVSE installation with ZEV Demand Generation Programs
** Hassle Free and No Cost for MUD Operator **

- **Provide turnkey design>permit>installation support (one signature)**
- **Use existing electrical capacity (some panel upgrades ok)**
  - Install networked L1 and L2 with load sharing
  - If installing L1, upsize conduit and conductors for future L2
  - Do not require a minimum port count per site.
- **Prioritize electrifying assigned parking spaces (some shared ok)**
- **Do not require minimum electricity throughput for the first years**
- **Include on-site EV purchase encouragement & technical assistance**
MUD Decentralized Low Power Solution
MUD Centralized Low Power Solution
MUD Resident Engagement

• Door-to Door Canvassing
• Flyers in Community Spaces
• Community Events
• E-mails through Community Manager
Purchase Guidance Support for Low-Income Renters

Purchase Guidance Programs streamline the pathway to electric vehicle ownership for low-income individuals by providing one-on-one assistance that engages and educates underserved residents about how electric vehicles can affordably meet their driving needs.
OUR MISSION: LESS EMISSIONS

Contact Information

Mahlon Aldridge
VP Strategy
maldridge@ecoact.org
831-227-9257

Sherry Lee Bryan
Program Manager
sbryan@ecoact.org
(408) 601-9756
Thank you and stay well!

Leora Broydo Vestel
CalCCA Director of Communications
leora@cal-cca.org