

# Q1 2018 Clean Transportation Program Advisory Council Meeting

March 23, 2018



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# Agenda

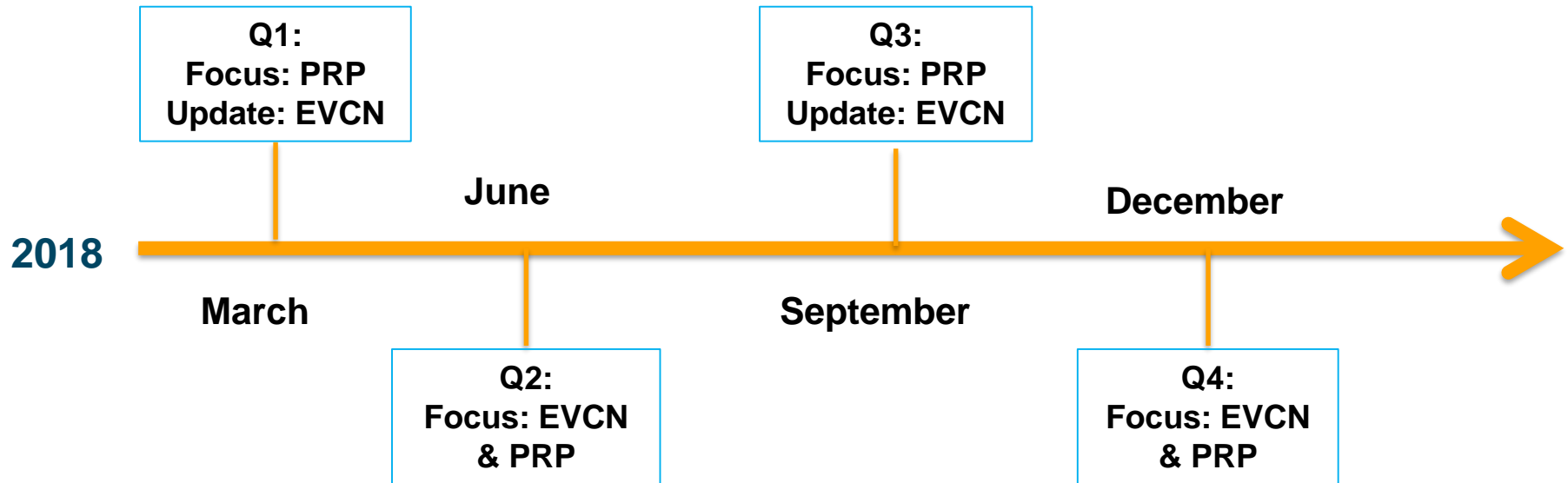
<b>Safety/ Introductions</b>	<b>9:00-9:15</b>
<b>Meeting Overview / EV Market Update</b>	<b>9:15-9:35</b>
<b>EV Charge Network Program Update</b>	<b>9:35-9:55</b>
<b>EV Cost of Ownership Tool</b>	<b>9:55-10:15</b>
<b>BREAK</b>	<b>10:15-10:25</b>
<b>SB 350 Priority Review Projects</b>	<b>10:25-11:00</b>
<b>AB1082 &amp; AB1083</b>	<b>11:00-11:30</b>
<b>Proposed Priority Review Projects</b>	<b>11:30-12:00</b>



# Clean Transportation Program Advisory Council

## Overview

- PG&E is expanding efforts on transportation electrification, with a number of filings and programs in development
- CPUC has directed PG&E to consult a Program Advisory Council in the development of these pilots and programs to gain feedback from industry stakeholders
- This platform will serve to gather insight and feedback to PG&E's proposals and on-going programs



# EV Market Update



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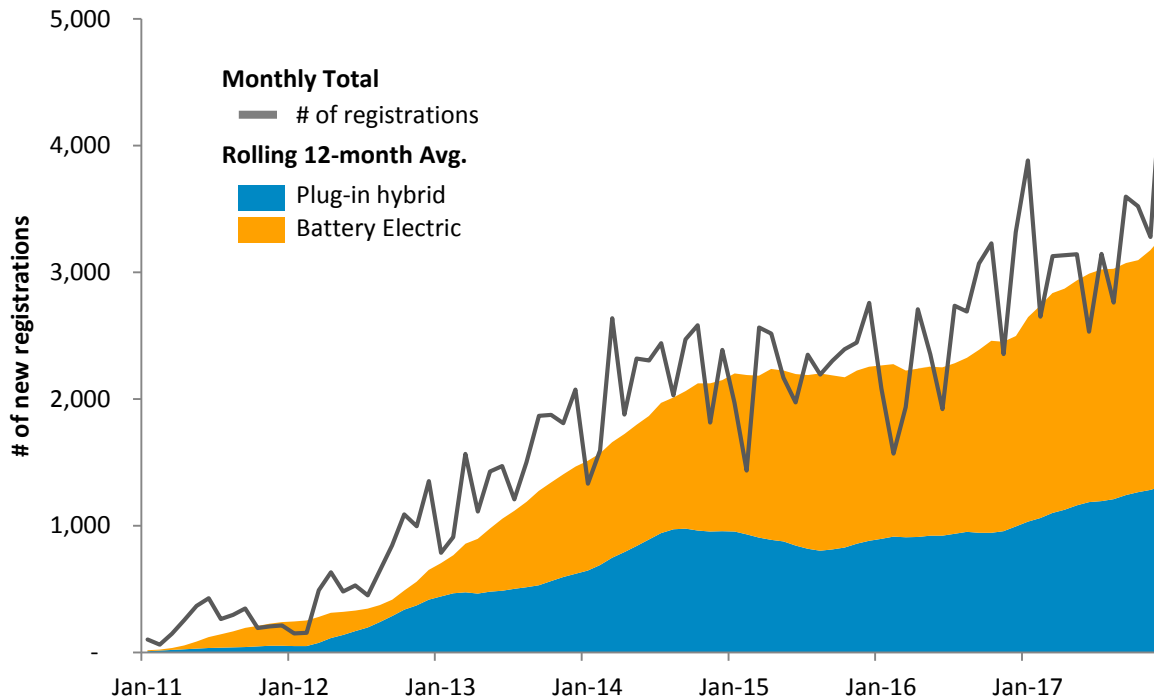


# EV registration growth

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**EVs registered** in PG&E service territory, through end of 2017

Monthly EV Registrations



2017 EV registrations in PG&E service area increased 32% over 2016, after two years of marginal growth.

EV registrations were 20% higher than conventional hybrid registrations in PG&E service territory last year.

Approximately one in every 16 cars sold in PG&E's service territory was electric last year.



# Governor Brown announces bold new ZEV goals for 2030

Through an Executive Order, Governor Brown announced a **2030 target of 5 million zero-emission vehicles**, significantly beyond the 1.5M vehicle target he previously set for 2025.

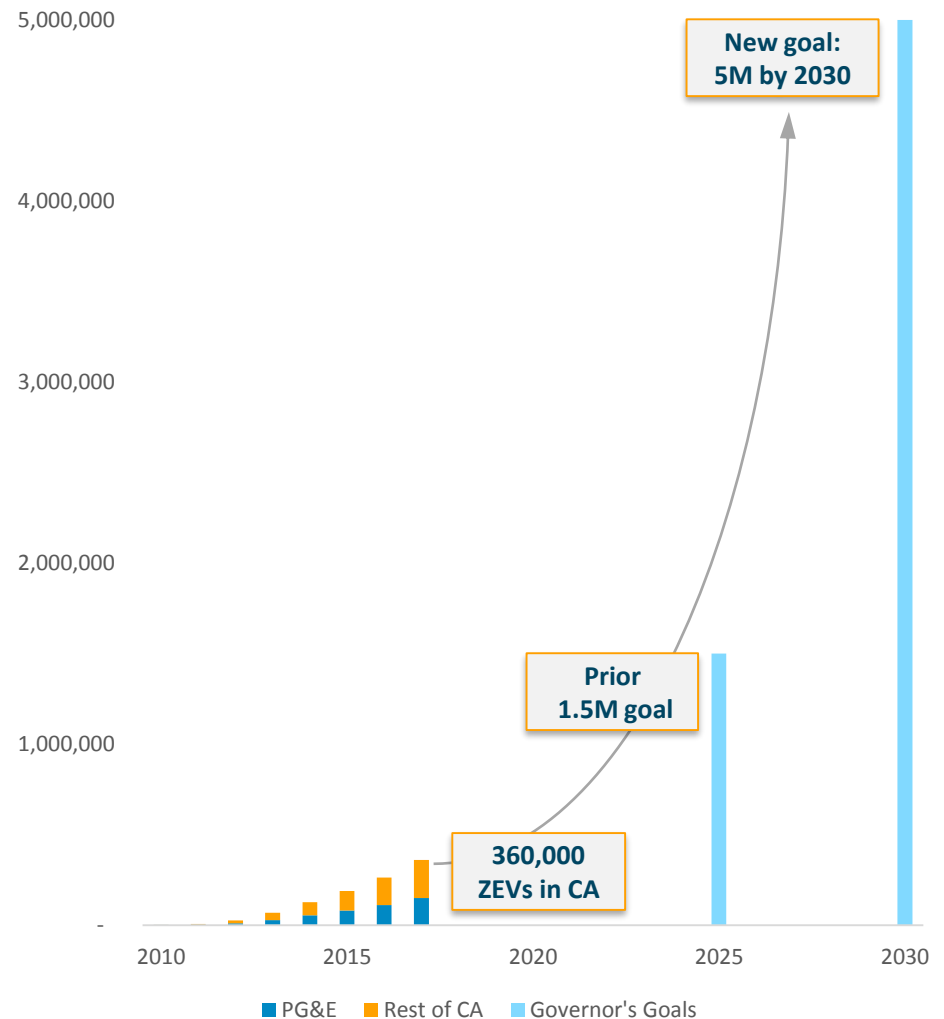
- This represents about 20% of all passenger vehicles

The Order also established concrete infrastructure targets for 2025

- 250,000 vehicle chargers, including 10,000 DC fast chargers
- 200 hydrogen refueling stations

Governor Brown also unveiled an eight-year, \$2.5 billion funding plan for clean transportation, which featured \$1.6B for vehicle incentives and \$900M for infrastructure.

California's Zero Emission Vehicle Market



# EV Charge Network Program Update



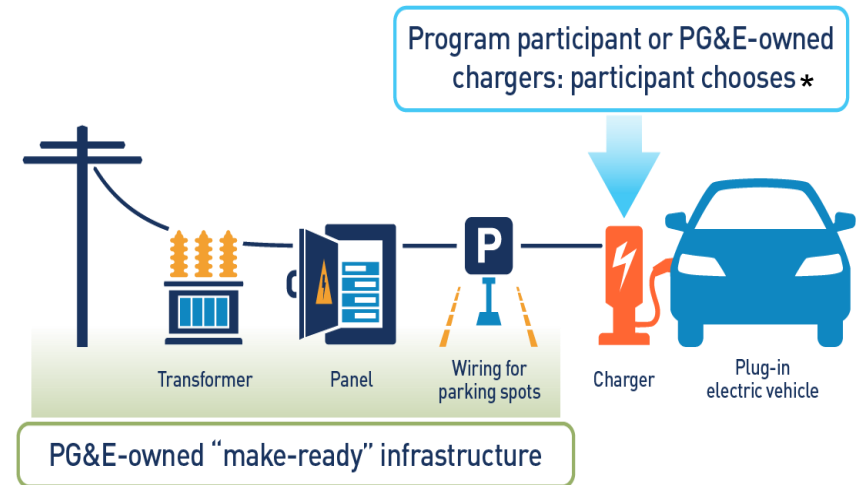
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# EV Charge Network Program Summary

## Fast Facts:

- **Scope:** 3 years (2018-2020); \$130M budget
- **Scale:** Up to 7,500 level 2 chargers (approx. 500-750 sites)
- **Sites:** Multi-unit dwellings (MUDs) and workplaces



## Key Features:

-  In addition to the infrastructure, a portion of the charging equipment cost will be **paid for by PG&E**
-  **Targeting** 20% chargers at MUDs and 15% in DACs
-  Program requires a minimum of **10 EV parking spaces** per site
-  **PG&E can own up to 35%** of the chargers, at MUDs and in disadvantaged communities (DACs)
-  PG&E will **pay for, maintain and coordinate** construction of infrastructure from the pole to the parking space (often 60-80% of the total project cost)



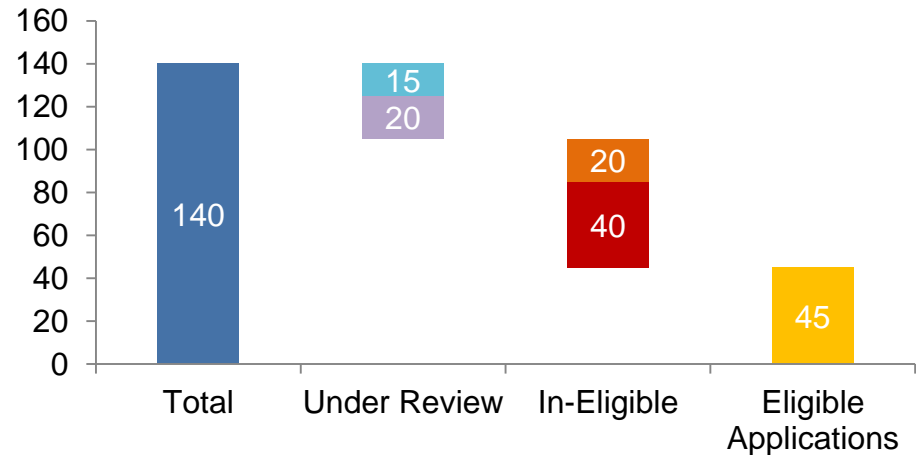


# Application and Participation Overview

## Application Status Summary

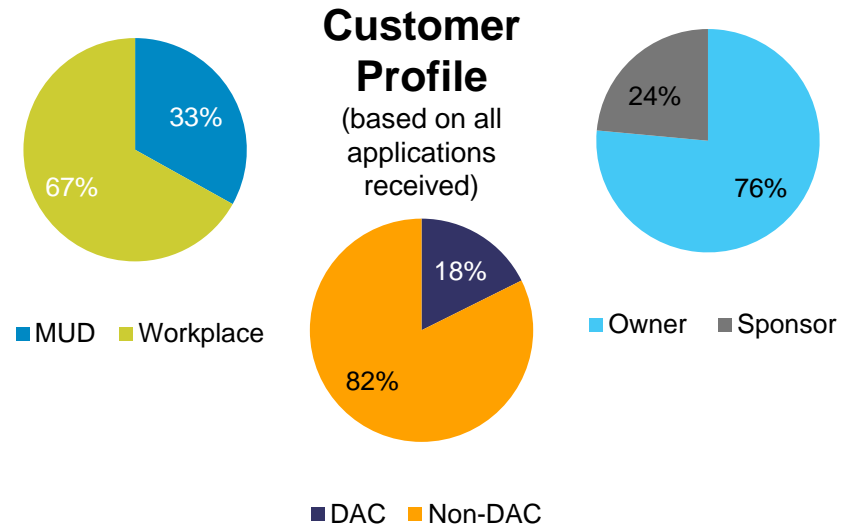
Application status as of March 21, 2018:

- Received: 140
- Under Review: 35
  - In construction: 3
  - Complete: 1
- Waitlist: 20
- Cancelled: 40



## Customer Acquisition

- PG&E continues to work with **internal BES sales reps** as well as **external partners** including CCAs, vendors, and non-profit organizations
- Deploying **targeted marketing** strategy to fill up construction pipeline while working towards achieving portfolio of 20% MUD and 15% DAC
  - Press release: Jan 15, 2018
  - Email campaign: Jan 18, 2018
- Developing program materials including new **EVSE hardware filtering tool**



## Procurement

### RFQ (EV Charge Owner):

- During PG&E's 3<sup>rd</sup> RFQ which concluded February 15<sup>th</sup>, 2018:
  - 17 vendors expressed interest in the RFQ
  - 3 new vendors were approved through the RFQ process
  - 1 existing vendor added approved hardware to sell to customers
- PG&E now has 18 approved vendor options for the EV Charge Owner option

### RFP (EV Charge Sponsor):

- PG&E remains in negotiations with vendors for the Charge Sponsor option

## Construction & Activation

- Started construction at first site in December 2017 at Merced Community College in Los Banos.
- The first chargers are expected to be activated by the end of March, at Travis Credit Union in Vacaville which will initiate program data collection.
- 3 projects are currently in construction, and we have a full construction schedule through May (~10 sites/month)



*Completed striping and preparation for EV charger installation at first site, Merced Community College, Los Banos*

# Electric Vehicle (EV) Cost of Ownership Tool



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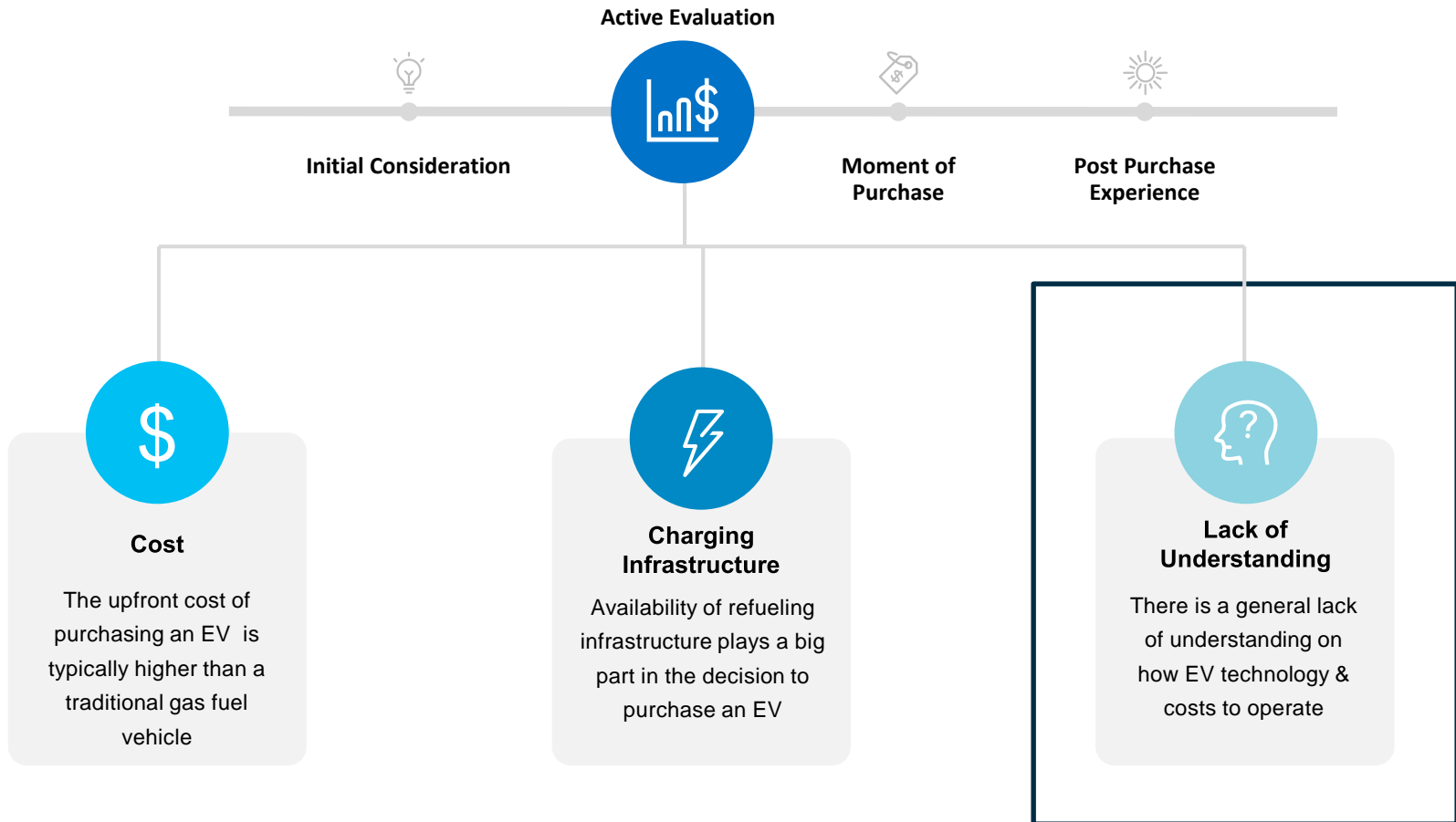
Advice Letter [5064-E and 5064-E-A](#) established “EV Cost of Ownership Tool”

A tool to help customers understand the full cost and benefits of owning an electric vehicle, while addressing:

- Vehicle range anxiety
- Electricity costs / rates
- Available incentives
- Overall cost of ownership

# Tool's Objective

McKinsey & Company found that **30 percent** of US car buyers have **considered buying electric cars**—but **only 3 percent** actually **bought one**





**Support EV adoption** by providing customers with a tool that is quick, easy to use and provides an accurate/personalized **cost breakdown for owning an EV**



## Quick

- Data from external sources loads instantly & and is up to date
- Results should be displayed instantly after user submits data



## Easy

- Minimize user input
- Auto fill data that is publicly available
- Allow user to modify inputs
- Benefits of owning an EV are tangible
- Results are easy on the eyes

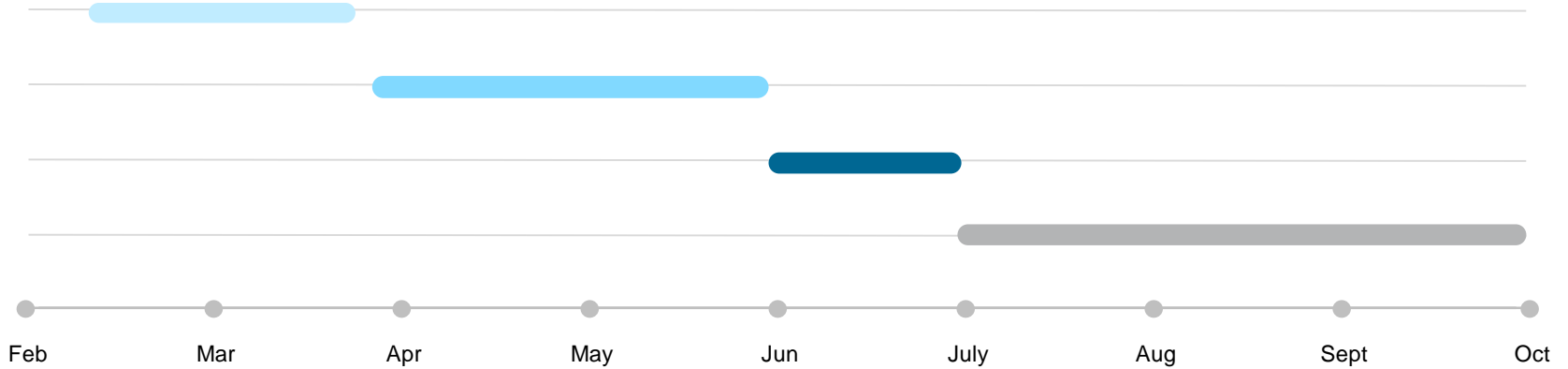


## Accurate/ Personalized

- Use user's interval data to project Electric Bill with addition of EV
- Show estimated cost for recommended electric rate plan
- Results provide High Decision Quality



# High Level Timeline



01 RFS Development

02 RFS

03 Contracting

04 Development and Implementation

# SB350 Approved Priority Review Projects



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# PG&E SB350 Priority Review Projects

	Status
1 Medium/Heavy Duty Fleet Customer Demonstration	Approved
2 Electric School Bus Renewables Integration	Approved
3 Idle Reduction Technology	Pending Tier 2 Advice Letter Filing
4 Home Charger Information Resource Pilot	Pending Tier 2 Advice Letter Filing (reduced funding)
5 Open Request for Proposals (RFP) for Third-Party EV Innovators	Not Approved



# Medium/Heavy Duty Fleet Customer Demo

## Pilot Goals



- 1. Further EV adoption by demonstrating lower Total Cost of Ownership (TCO) for electric transit buses vis-à-vis fossil fuel vehicles through:**
  - a) Minimizing infrastructure costs:** Working closely with transit agencies to find efficiencies in infrastructure installation
  - b) Minimizing fuel costs:** Managing charging to minimize peak demand potentially using tools such as energy storage and/or charge management software
- 2. Reduce Greenhouse Gas Emissions (GHG) and other criteria air pollutants**

## QUICK FACTS



### Market Segment

Transit Agencies



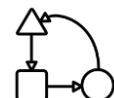
### Cost

\$3.35 million



### Implementation

Constructed by January 2019  
One year of monitored EV operations



### Business Model

Customer owned chargers  
PG&E owned make ready



### Project Partner(s)

TBD – in discussion with 1 agency



### Vehicle Goals

2-10 electric buses

## Pilot Goals



1. **Reduce the Total Cost of Ownership (TCO) of electric buses for school districts by:**
  - a) **Minimizing infrastructure costs:** Working closely with school partners to find efficiencies in infrastructure installation
  - b) **Minimizing fuel costs:** Managing charging to reduce electric usage during expensive, peak times
2. **Inform how fleet MD/HD vehicles can act as distributed energy resources during periods of high renewable penetration by testing incentive mechanisms for compensating fleet operators to adapt charging schedules**

## QUICK FACTS



### Market Segment

School Buses



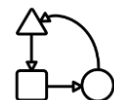
### Cost

\$3.35 million



### Implementation

Constructed by January 2019  
One year of monitored EV operations



### Business Model

Customer owned chargers  
PG&E owned make ready



### Project Partner(s)

TBD Bay Area School District(s)



### Vehicle Goals

2-5 electric buses

## Pilot Goals



1. **Further adoption of idle reduction technology by demonstrating lower Total Cost of Ownership (TCO) through:**
  - a) **Minimizing infrastructure costs:** Working closely with customers to find efficiencies in infrastructure installation
  - b) **Minimizing fuel costs:** Testing the hypothesis that “electric fuel” costs compare favorably to the cost of diesel fuel spent while idling; assessing viability of tools such as storage and/or charge management software
2. **Reduce emissions of air pollutants from diesel engines**

## QUICK FACTS



### Market Segments

eTRU: Grocery & Food Service



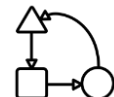
### Cost

\$1.72 million



### Implementation

Constructed by January 2019 \*  
One year of monitored EV operations



### Business Model

Customer owned chargers  
PG&E owned make ready



### Project Partner(s)

TBD – in discussion with 1-3 interested parties



### Vehicle Goals

N/A: at least 15 electrified spaces



# Evaluation Criteria for PRP Sites/Customers

## Disadvantaged Community (DAC) Status

Sited in a PG&E Disadvantaged Community \*

## Geographic Diversity

Dispersed throughout PG&E service territory

## Cost, Ability, Timing to Build

Can be built by end of year 2018

AND

Costs in line with initial estimates from SB350 filing

## Procurement Timeline

Owens its own fleet

AND

Electric vehicles already ordered

OR

Grant funding requested

OR

Electric fleet procurement plan developed

Best fit



Minimally acceptable

\* Received percentile rating greater than or equal to 64.63% per Cal Enviro Screen 3.0



# Progress Updates

## STATUS

## Q2 MILESTONES

1

### Medium/ Heavy Duty Fleet Customer Demonstration

- Preliminary design in progress with 1 transit agency
- Have received interest from 1-2 additional agencies (several of which are not in DACs)

- Customer contract signed
- Detailed project scope complete
- Equipment procurement process begun

2

### Electric School Bus Renewables Integration

- Preliminary design and contracting in progress with 1 school district for 2 chargers
- Initial discussions with other school districts for 1-2 chargers

- Easement(s) completed
- Project design complete and signed off by customer(s), PG&E
- Charging equipment procured

3

### Idle Reduction Technology

- Soliciting customer commitments
- Preparing Tier 2 Advice Letter filing and presentation for the California Freight Advisory Committee (CFAC)

- Feedback from CFAC on implementation plan
- Tier 2 Advice Letter filed

4

### Home Charger Information Resource Pilot

- Work to commence after Tier 2 Advice Letter is approved by Energy Division

- Tier 2 Advice Letter filed proposing how the budget will be spent

# Proposed Filings: AB 1082 & 1083 Schools and Parks



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# AB1082 and AB1083 Overview

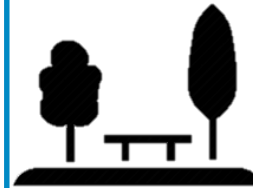
**AB1082 / AB1083** | AB1082/AB1083 authorize the IOUs to file proposals to pilot charging infrastructure in schools and state parks and beaches

**AB 1082:  
Schools /  
Educational  
Institutions**



- School can establish guidelines for use of the charging stations
- School authorized to require users to pay electricity costs
- Proposal may include parameters for installation of charging structures for school buses

**AB 1083:  
State Parks  
and Beaches**



- California State Department of Parks and Recreation shall determine which parks and beaches are suitable for charging
- Parks shall not be required to incur any costs or liability related to the charging stations for the pilot's duration

- Prioritize disadvantaged communities
- Propose reasonable mechanism for cost recovery
- Each pilot budget not to exceed \$10M
- Pilot duration not to exceed 2 years





# Public School Landscape in PG&E Territory

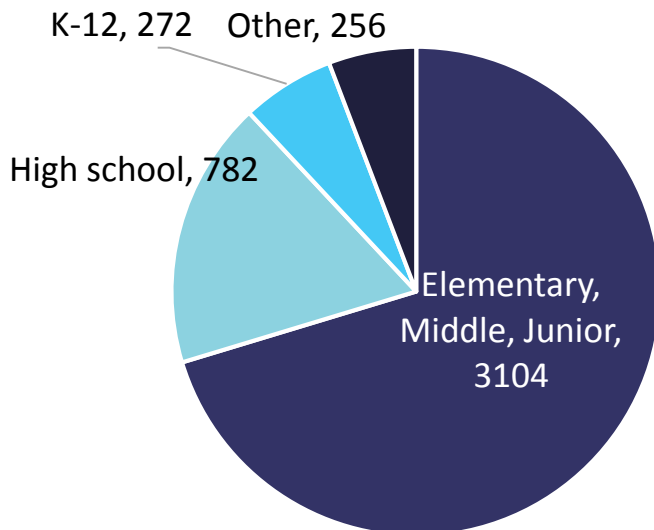
## K-12 Schools: Key Inputs

- Schools have few resources available for program design, planning, maintenance, etc.
- Schools are concerned about:
  - Limited number of parking spaces
  - Allowing the public access to chargers on school campus
  - Vandalism
- Schools are interested in incorporating EV charging into the curriculum, and/or integrating with past investments in solar and energy efficiency

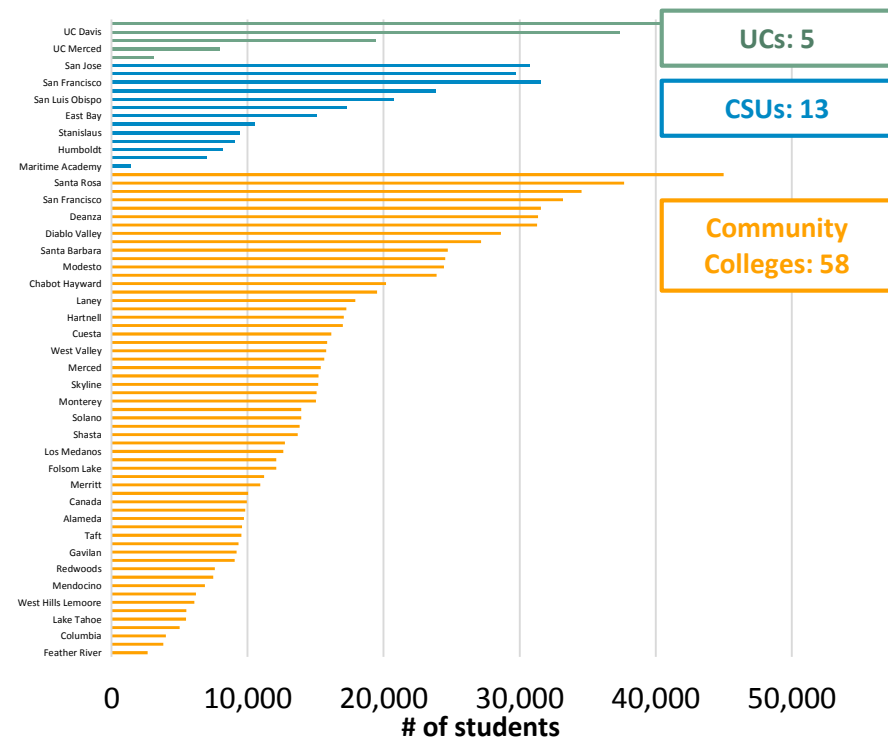
## Higher Education Campuses: Key Inputs

- Campuses are seeking ways to meet sustainability goals, including fleet electrification
- Many larger campuses have already installed some EV chargers
- Many higher ed campuses own their own distribution systems

## >4,000 Public K-12 Schools in PG&E territory



## 75 Public Higher Ed campuses in PG&E territory





## ELEMENTARY, HIGH SCHOOLS and SMALL HIGHER ED CAMPUSES

### *Vision*

Meet the needs of small campuses through a installation of 2-4 Level 2 charging ports

### *Program Details: Work in Progress*

**Number of sites:** 10-20

**Equipment:** 2-4 Level 2 charging ports per site

**Vehicle type:** Personal vehicle: staff, possibly students and parents

**Rates:** Customers to stay on existing rates

**Ownership model:** Option to schools of site host ownership or PG&E ownership

**Participation payment:** None



## LARGE HIGHER EDUCATION CAMPUSES

### *Vision*

Meet multiple campus transportation needs and support nearby transit corridors with multiple different charging technologies

### *Program Details: Work in Progress*

**Number of sites:** 2 or 3

**Equipment:** 10-20 Level 2 charging ports; 1-2 DC Fast Chargers

**Vehicle type:** Personal vehicles, commuter vehicles; passenger shuttles and other fleet vehicles

**Rates:** Customers to stay on existing rates

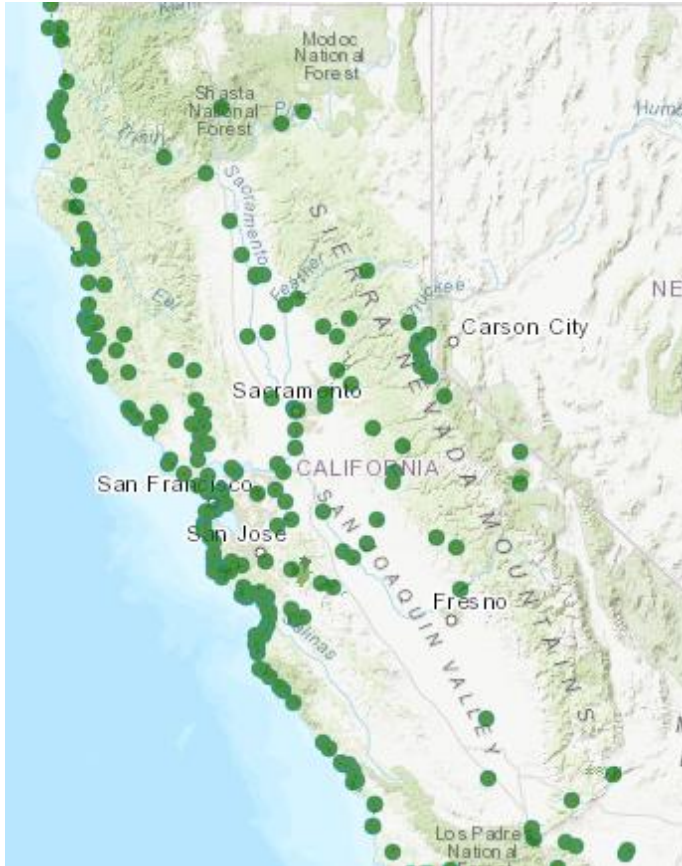
**Ownership model:** Option to schools of site host ownership or PG&E ownership\*

**Participation payment:** TBD

\*Will vary for higher ed campuses that own their own distribution systems



# California State Parks in PG&E Territory



## California State Park considerations:

- **Minimize cost and risks** associated with chargers in parks
- Minimize impact to **availability of visitor parking**
- Facilitate **fleet electrification** in accordance with Governor's Executive Order
- Increase **park revenue and visitor-ship**
- **Increase access** to parks for disadvantaged communities

## 2016 ZEV Action Plan

**50%**

of all state agency light-duty vehicle procurements be ZEV by 2025

**5%**

of all workplace parking spaces at state-owned facilities to have EV charging



# Proposed Program design for AB1083



## DC FAST CHARGING TO CONNECT REMOTE PARKS AND BEACHES

### *Vision*

Electrify scenic routes across the state, enabling EV access to California Parks and Beaches

### *Program Details: Work in Progress*

**Number of sites:** 6-8

**Equipment:** 1 DC Fast Charger per site

**Vehicle type:** Personal vehicles (visitors)

**Rates:** Customers to stay on existing rates

**Ownership model:** PG&E owns

**Participation payment:** None



## FLEET AND EMPLOYEE VEHICLE CHARGING

### *Vision*

Facilitate State Park adoption of electric fleet vehicles to meet the Governor's mandates

### *Program Details: Work in Progress*

**Number of sites:** 10-20

**Equipment:** 2 Level 2 charging ports with infrastructure for future installation

**Vehicle type:** Fleet vehicles (with potential for employee charging during the day)

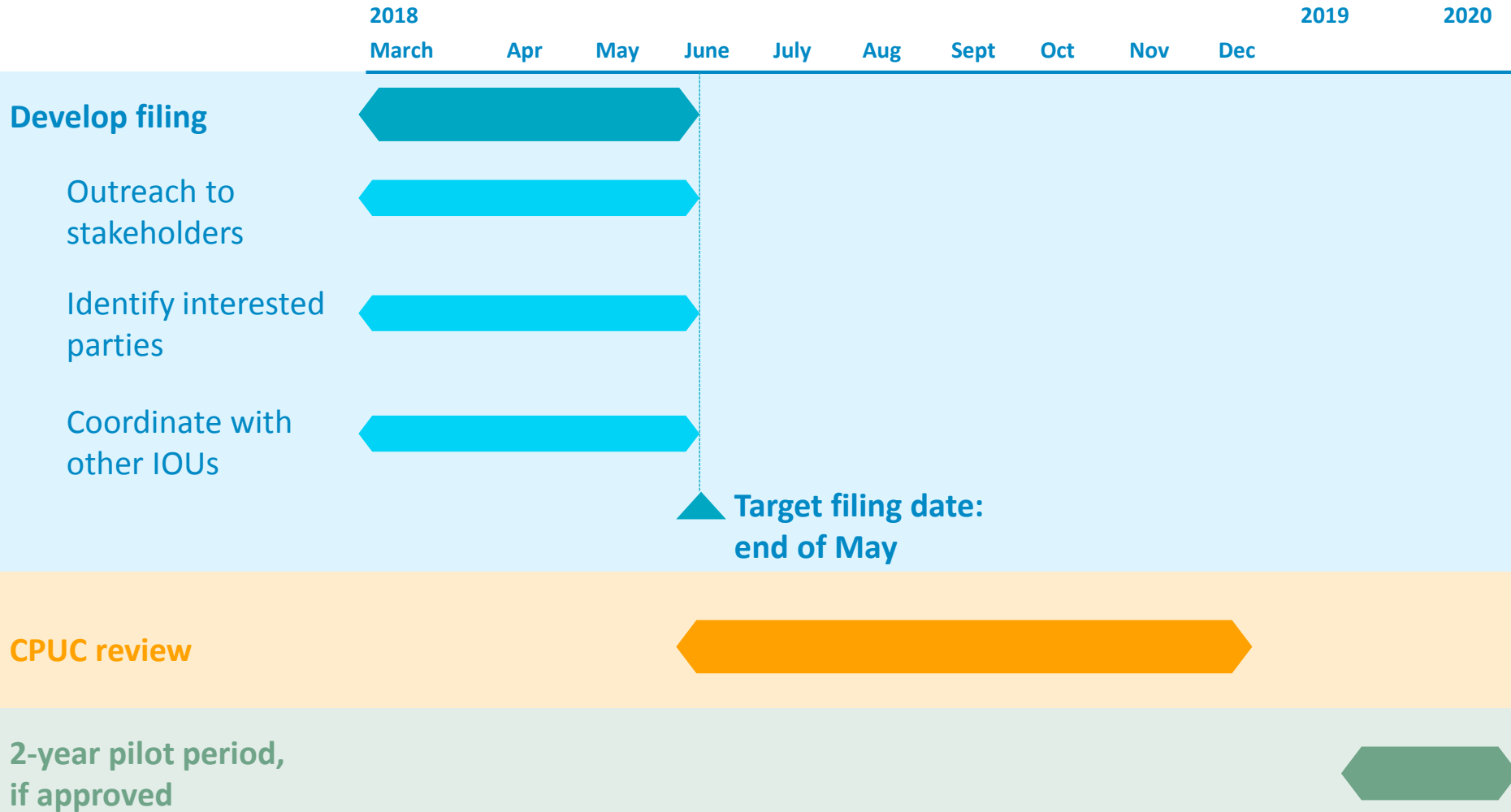
**Rates:** Customers to stay on existing rates

**Ownership model:** PG&E owns

**Participation payment:** None



# Next steps



# Discussion & Feedback

# Proposed Filings: SB 350 Priority Review Projects



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# Supplemental SB350 Priority Review Projects

## PG&E is developing a new filing of Priority Review Projects

- Under SB350 each utility can include up to \$20M of Priority Review Projects (PRPs):
  - Jan 2018 CPUC approved 4 PRPs with total \$8M budget, denied 1
  - PRPs must be “non-controversial”, short term (i.e. one year), up to \$4M per project
  - Complementary to existing efforts – not duplicative

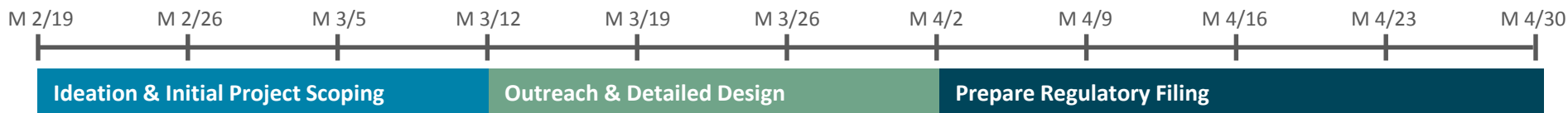
“...welcome projects that leverage ongoing rebuilding efforts in disaster-affected areas within PG&E service territory”

Current Focus Areas for PRP Filing

Wildfire Resiliency

Infrastructure for Electrification of Autonomous Vehicles (AVs)

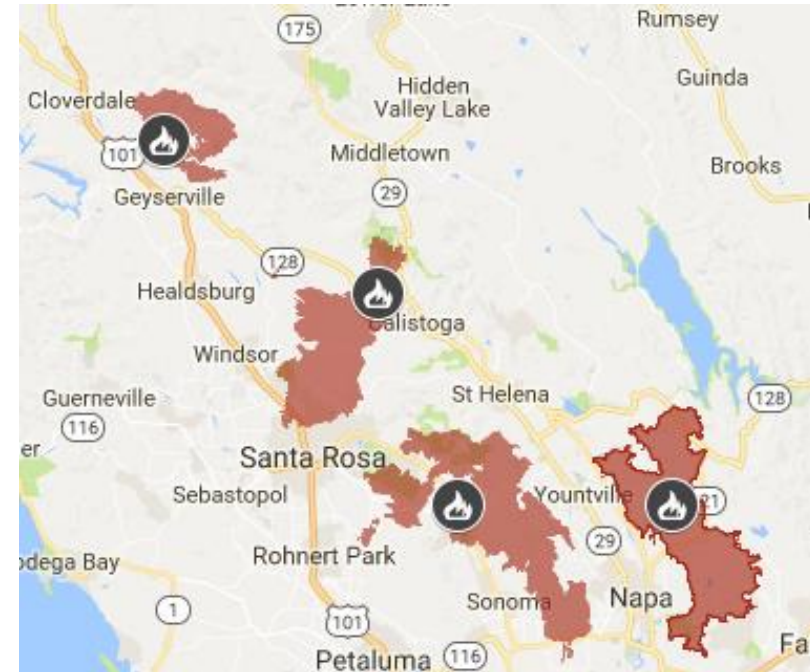
## Target Timeline





# Wildfire PRP: Affected area Background

- Majority of impacted customers are Residential and in Sonoma County
- Existing Adoption in Sonoma
  - 4,000 BEV + PHEV
  - 1% New EV Adoption (↔)
- EV Infrastructure in Sonoma
  - 66 DC Fast Chargers (↓)
  - 457 L2 Chargers (↔)



“new developments...that focus on ensuring...include TE”

“ensure the redevelopment or new development is climate-resilient”

“leverage ongoing rebuilding efforts in disaster-affected areas”

# Current Program design for Wildfire PRP

## Project Structure:

Offer EV charging infrastructure in Wildfire affected areas that is:

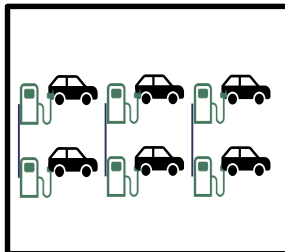
- Resilient and widespread to support residents
- In critical areas to support emergency and evacuation operations

5-7 projects, sited with input from city planners and local community groups

## Portfolio of charging for resiliency applications

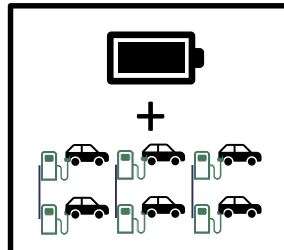
### Level 2 Chargers

- “priority restoration” central sites across the county



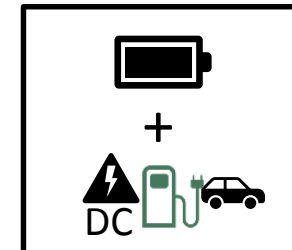
### Battery + Level 2 Chargers

- used in emergency operations during outages



### Battery + DC Fast Chargers

- provide quick charging in evacuation corridors

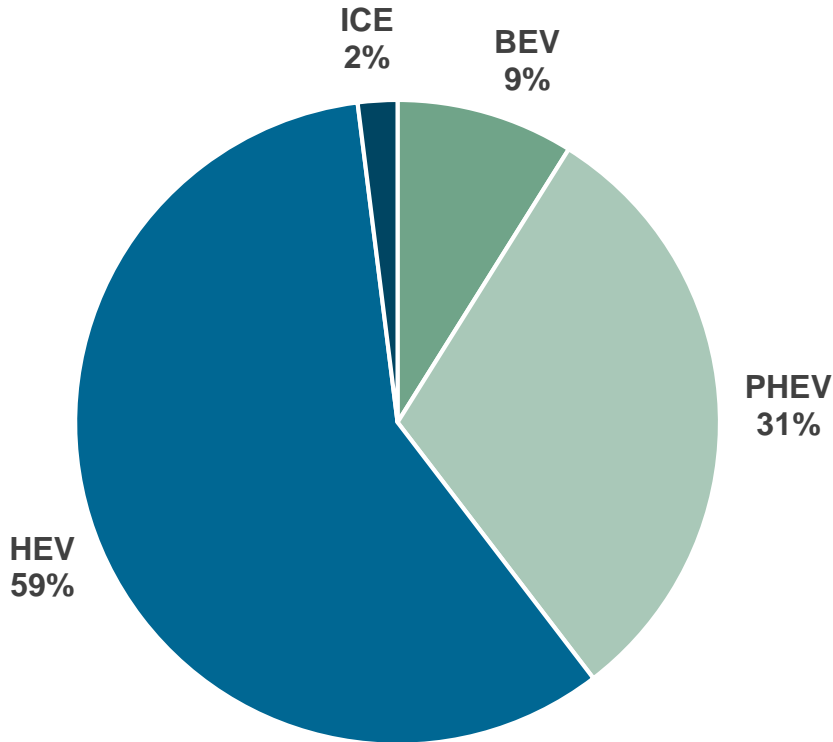




# AV Infrastructure Project: So far, Autonomous ≠ Electric

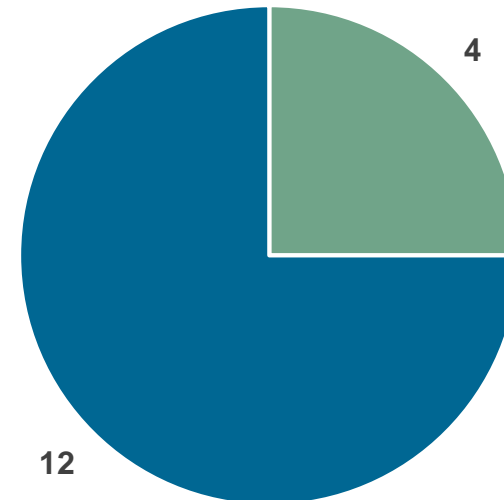
Over the last 3 years, a majority of Autonomous Vehicle (AV) testing in California has been fueled by gasoline.

### AV Miles by Vehicle Type



### AV Companies by Vehicle Type

- BEVs or PHEVs for some or all AV driving
- HEVs or ICEs for all AV driving, or unknown



BEV – Battery Electric Vehicle  
PHEV – Plugin Hybrid Electric Vehicle  
HEV – Hybrid Electric Vehicle  
ICE – Internal Combustion Engine

Percentages may not add to 100 due to rounding



# AV Infrastructure Project: Accelerate Merging of AV and EV Technology

## Gap and Customer Needs

AV Companies need easy access to fast fueling to enable high-mileage testing of autonomous technology.

Autonomous EV Use Case	PG&E's Existing & Proposed Programs		
	EVCN	Fast Charge	Fleet Ready
Light Duty Vehicles	Light Duty Vehicles	Light Duty Vehicles	Medium/Heavy Duty Vehicles
Private Access	Public Access	Public Access	Private Access
DCFC	Level 2	DCFC	Level 2/DCFC

## Objective

Accelerate electrification of AVs into the current early testing phase

## Program Details: *Work in Progress*

**Number of sites:** 2-5

**Eligibility:** partner companies must meet certain criteria aimed at:

- fast deployment
- increasing electric proportion of AV miles drive
- high utilization during off-peak hours
- safety

**Equipment:** DCFC depending on size of charging needs

**Vehicle type:** light duty AV fleet vehicles

**Ownership model:** make-ready infrastructure owned by PG&E, DCFCs owned by partner company

**Participation payment:** partner company buys DCFC, 25% rebate payment

# Discussion & Feedback