Q3 2018 Clean Transportation Program Advisory Council Meeting

September 20, 2018

Together, Building a Better California

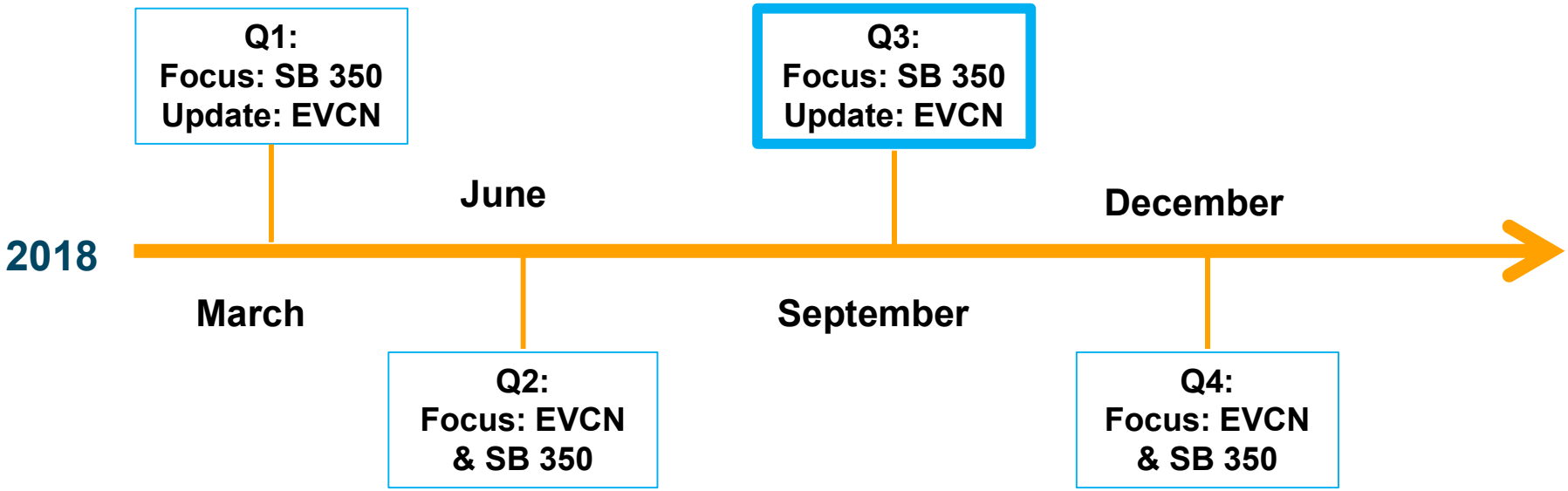
Agenda

Safety/ Introductions	9:00 – 9:15
Meeting Overview / EV Market Update	9:15 – 9:30
EV Charge Network Program Update	9:30 – 10:00
SB 350: Priority Review Projects Update	10:00 – 10:45
BREAK	10:45 – 11:00
SB 350: Standard Review Projects Update	11:00 - 12:00

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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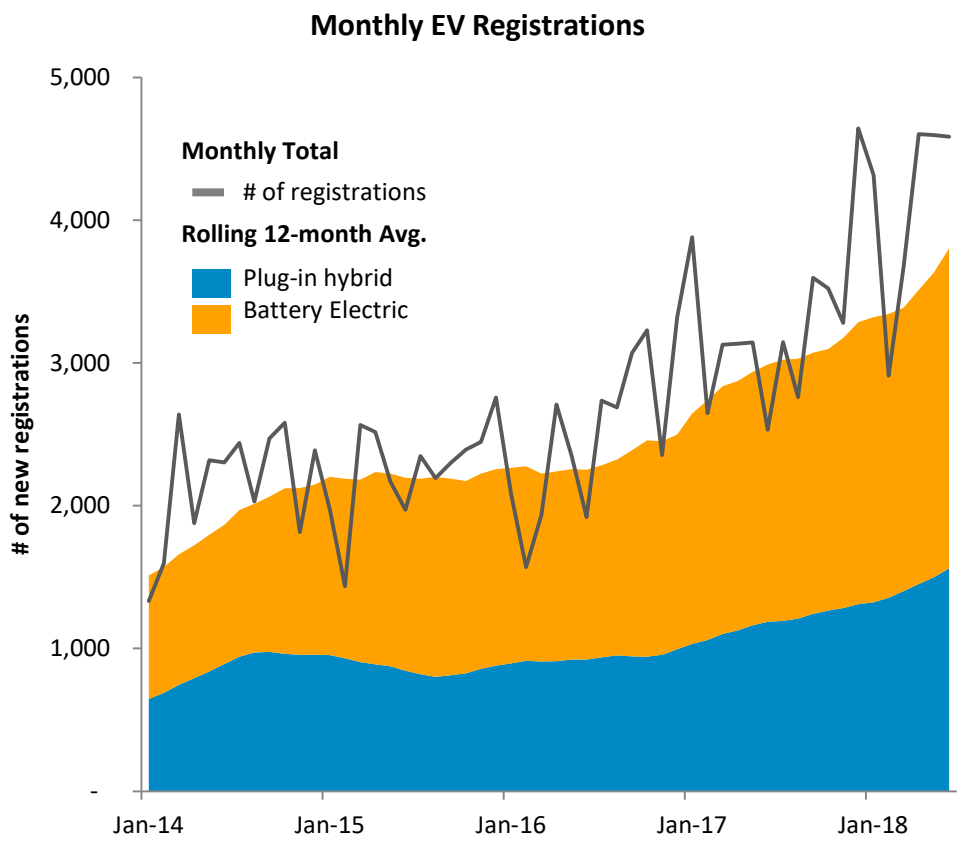
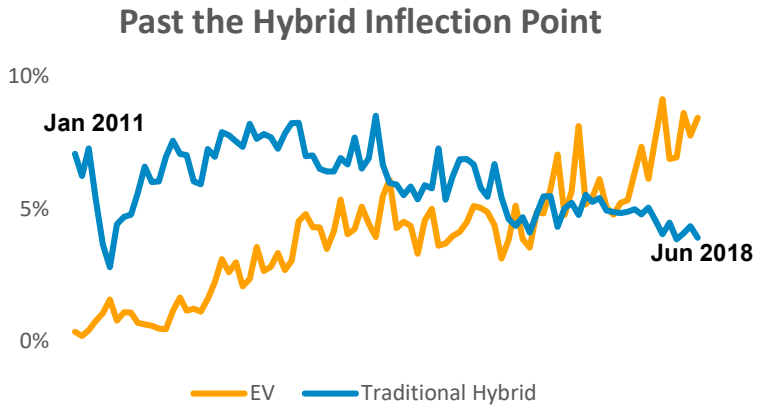
EV registration growth

175,784 **EVs registered** in PG&E service territory, through Q2 of 2018



Nearly **25,000 new EVs** were registered in PG&E's service area **in the first half of 2018**. It took 8 months to reach that mark in 2017, and 10 months to do so in 2016.

EVs represent **8% of new vehicle registrations** through Q2, and have passed hybrid vehicles in market share:



Source: EPRI, Based on external registration data

A growing market for electric transit buses

The California Air Resources Board is considering regulations to shift all public transit bus fleets to Zero Emissions by 2040

- The Innovative Clean Transit rule would mandate 100% of new bus purchases be ZEVs after 2029
- Of the roughly 10,000 bus fleet statewide, **110 electric buses are in operation**, with another 600+ on order, awarded via grants, or planned
- 12 transit agencies, representing 40% of the total fleet, have set 100% ZEB targets, including SF MTA, San Joaquin RTD, SamTrans, VTA, and Santa Cruz Metro
- A coalition of 35 mayors across the state signed on to support the transit rule at CARB.

It can be done!

Shenzen, China – the burgeoning megalopolis of 12 million people that surrounds Hong Kong – converted all 16,000 of the city's buses to electric drive.

Source: CARB Innovative Clean Transit

EV Charge Network Program Update

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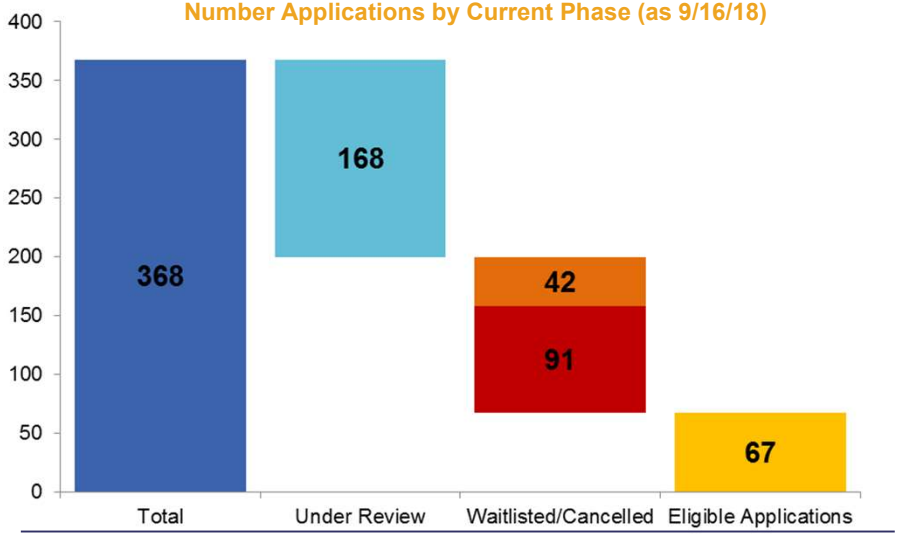
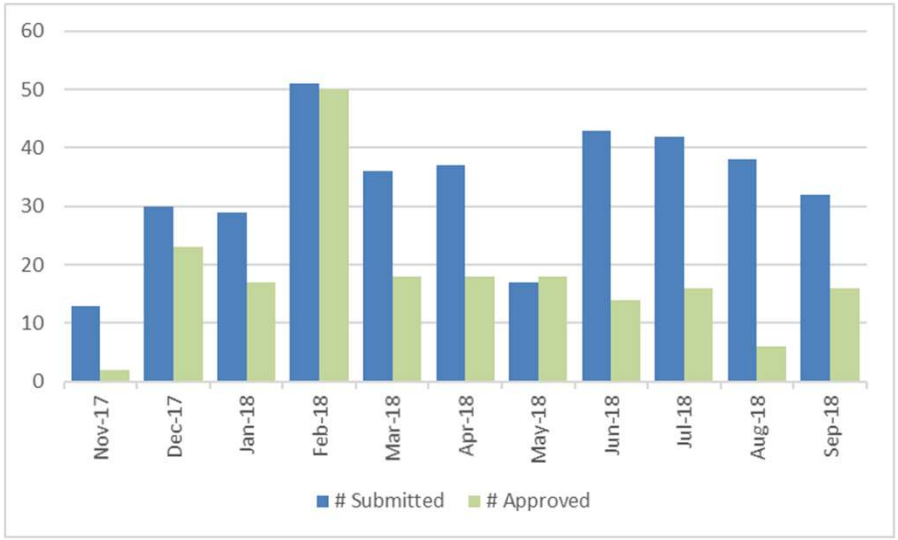
Customer Acquisition Metrics

Number Applications by Current Phase (as 9/16/18)



Applications Submitted and Approved by Month

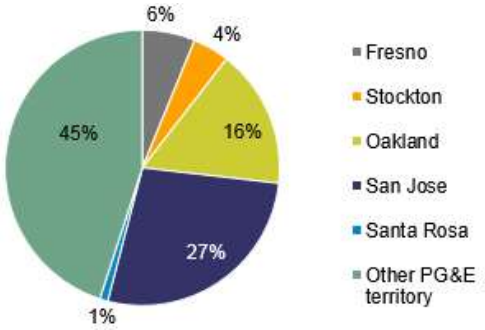


Of the 368 applications received thus far, 67 have been approved as eligible sites and are in design, construction, or utilization phases.

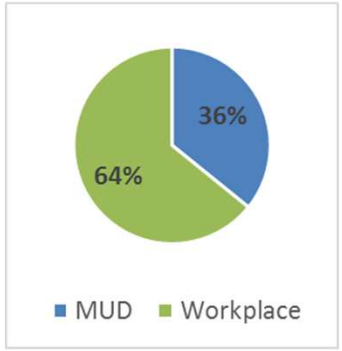
Application intake has been driven by PG&E sales reps, with roughly 60% of applications coming in from a sales rep lead.

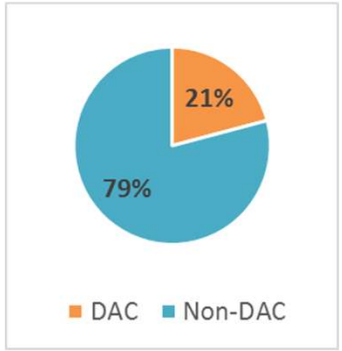
Starting in April 2018, PG&E has targeted certain geographies to promote diversity of site locations and meet targets for the site-type break-downs listed to the right.

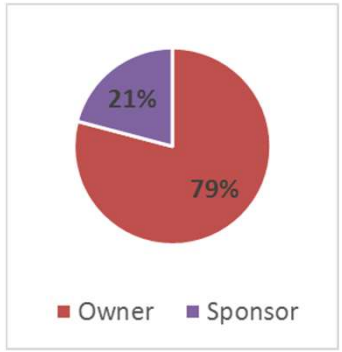
Submitted Application Geography Since 4/1



Site Type Breakdown (of Eligible Applications)







EVCN Construction and Activation

Construction & Activation

- In total, 8 sites have completed construction thus far (representing 90 ports) with 6 of those sites being activated already.
- An additional 9 sites are currently in the construction phase (representing 143 ports).
- Sites in the Construction and Activation phases are currently averaging about 14 ports per site.

RFQ Approved Vendors

19 vendors approved for the EV Charge Owner option

- ABM
- Andromeda Power
- BTCPower
- ChargePoint
- eMotorWerks
- EV Box
- EV Connect
- EVoCharge
- EVSE LLC
- National Car Charging
- Shell New Energies
- Greenlots
- Kitu Systems
- Oxygen Initiative
- Liberty Plug-Ins
- PowerFlex Systems
- SemaConnect
- Tellus Power
- Verdek

2018 RFQ 2

4 Vendors Applied

3 Existing Vendors Passed

1 New Vendor Being Reviewed

EVCN Program Update

Photos from EVCN & IBEW ribbon cutting event on August 28, 2018 at completed IBEW EVCN site in Vacaville

Trends and Milestones

- Growing **multi-site applications**, largely from government entities
- Customers placed on the **waitlist are reengaging** to continue site assessment and proceed towards construction
- Secured nearly **1,000 viable ports** to move into construction in coming months
- Currently **exceeding both MUD and DAC targets** for constructed projects
  - MUD goal: 20%; actual: 25%
  - DAC goal: 15%; actual: 38%

SB 350
Priority Review Projects

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PG&E SB350 Priority Review Projects

		Regulatory Status
1	Medium/Heavy Duty Fleet Customer Demonstration **Contractor Selected**	Approved
2	Idle Reduction Technology **Customer Selected/Contract Negotiations Underway**	Approved
3	Electric School Bus Renewables Integration **Design Phase Underway**	Approved
4	Home Charger Information Resource Pilot **Development to begin in Q4**	Approved

PG&E Charging RFI Analysis Completed

Statewide Evaluator Selected

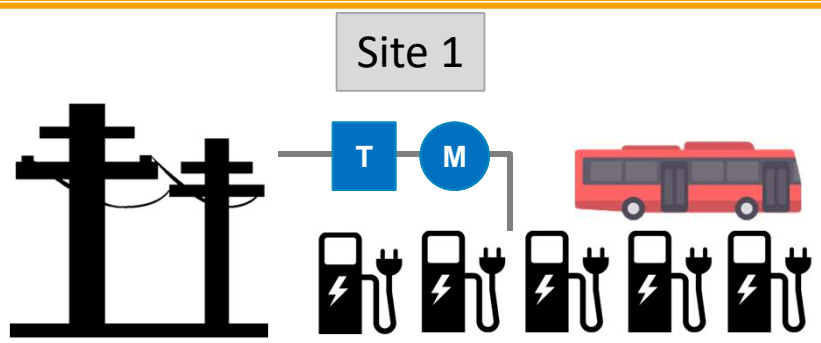
Medium/Heavy Duty Fleet Customer Demo

Project Partner

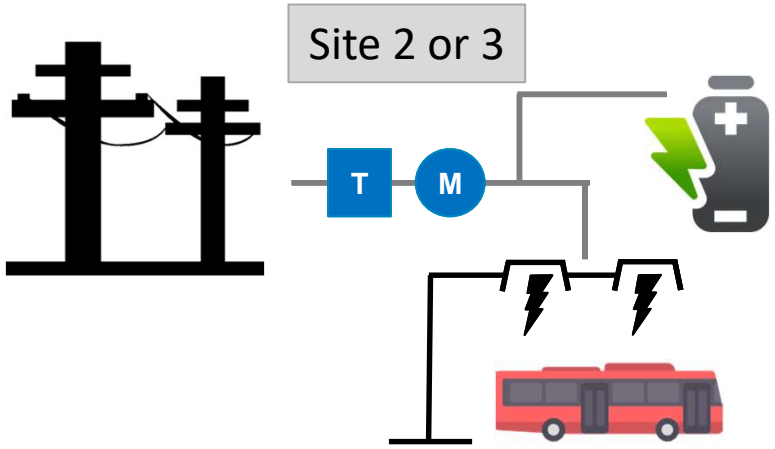
San Joaquin Regional Transit District (SJRTD)

- SJRTD is located in and serves a **Disadvantaged Community**
- Current fleet has **12 electric buses**
  - Charged using **two overhead extreme fast chargers** (each charger rated for up to 350 kW)
- Additional five electric buses on order, bringing total fleet to **17 electric buses** by end of 2018
- Plan for **all-electric bus fleet** (~100 buses) by 2025

Project Scope



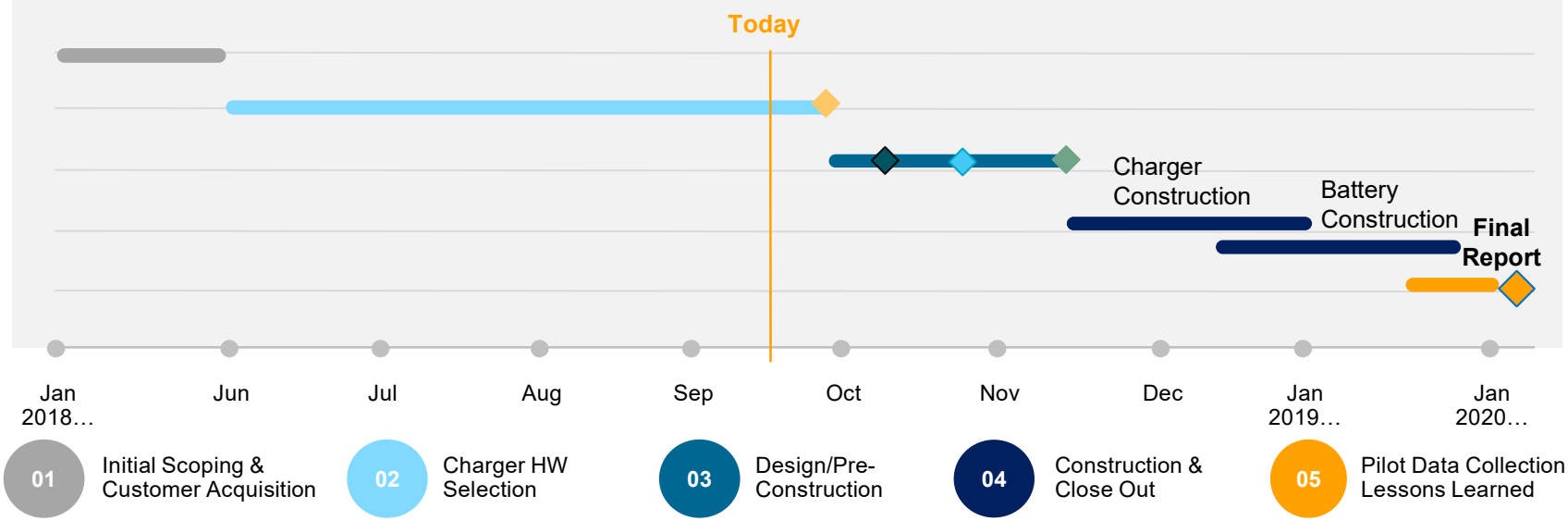
- **Five 60 kW** overnight depot chargers



- **Battery energy storage system** paired with existing extreme fast chargers

Medium/Heavy Duty Fleet Customer Demo

Pilot Project Construction and Data Collection Schedule



Key Upcoming Milestones

- Purchase order issued for chargers.....09/19/2018
- Deployment of overhead demand management software.....10/15/2018
- Begin design of depot charger site.....10/20/2018
- Battery sizing and procurement.....10/31/2018

High Level Pilot Goals

Transit Operator Electrification | *Battery Storage Integration* | *Readiness for Fleet Ready Program*

Idle Reduction Technology

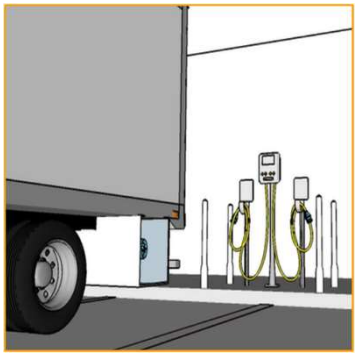
Project Partner

Food Distribution Service Center Facility

- Facility is located in and serves a **Disadvantaged Community**
- Facility is **2.2 million square feet**
- Facility has roughly **313 dock spaces**
- Current fleet
  - Consists of **664 trucks**
  - 232 trucks with eTRU units capable of running on diesel or electricity
- Plan for 550 – 600 **eTRU ports** if pilot is success

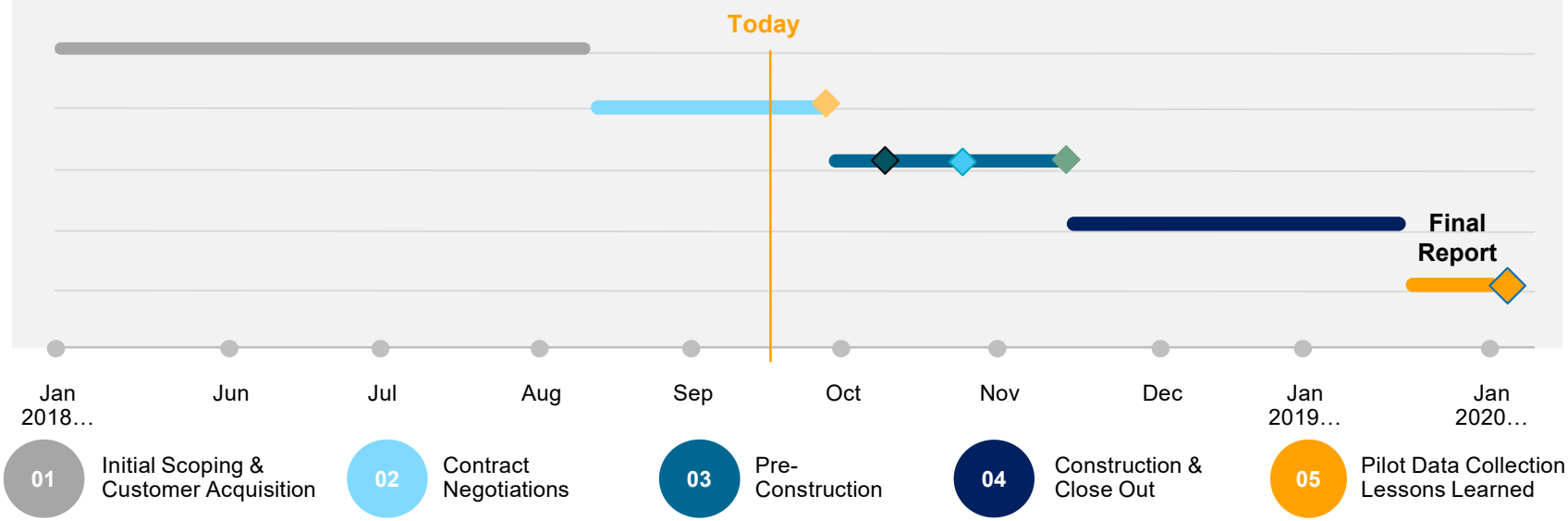
Project Scope

- **Deployment** of 25 electrified receptacles for eTRU connection (each 15-17 kW, adding a total load up to 425 kW)
- Demonstrate building off of customer owned infrastructure
- Demonstrate minimizing fuel costs by reducing diesel idling
- Understand deployment of eTRU technology and impact of site operations



Idle Reduction Technology

Pilot Project Construction and Data Collection Schedule



Key Upcoming Milestones

- Finalize contract with customer.....10/01/2018
- Select charging port technology.....10/24/2018
- Procure charging ports 10/31/2018
- Begin design of site installation.....11/15/2018

High Level Pilot Goals

eTRU Technology Adoption

Minimizing Fuel Cost

Readiness for Fleet Ready Program

Electric School Bus Renewables Integration

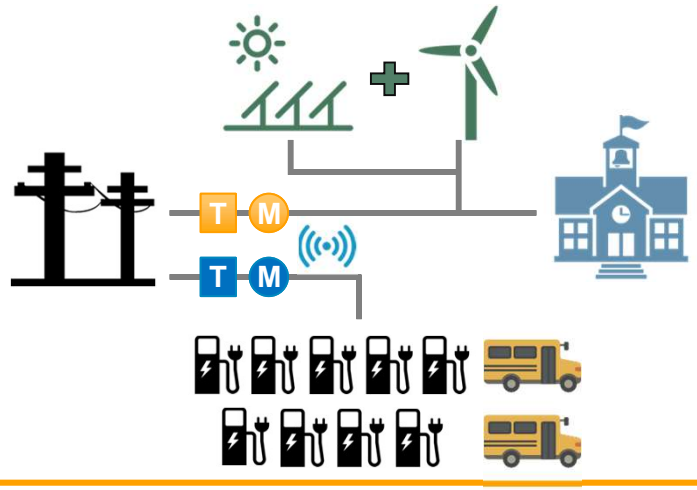
Project Partner

Pittsburg Unified School District

- K-12 school district, serving 13 school sites, including 8 elementary schools
- Serves a **Disadvantaged Community**
- PV solar arrays generate ~50% of energy needs across all sites
- Adding **9 electric buses** to fleet of 24 at bus depot at administration building
- Installing **~200KW onsite wind and solar renewable generation,** at the same location, coming online Fall 2018

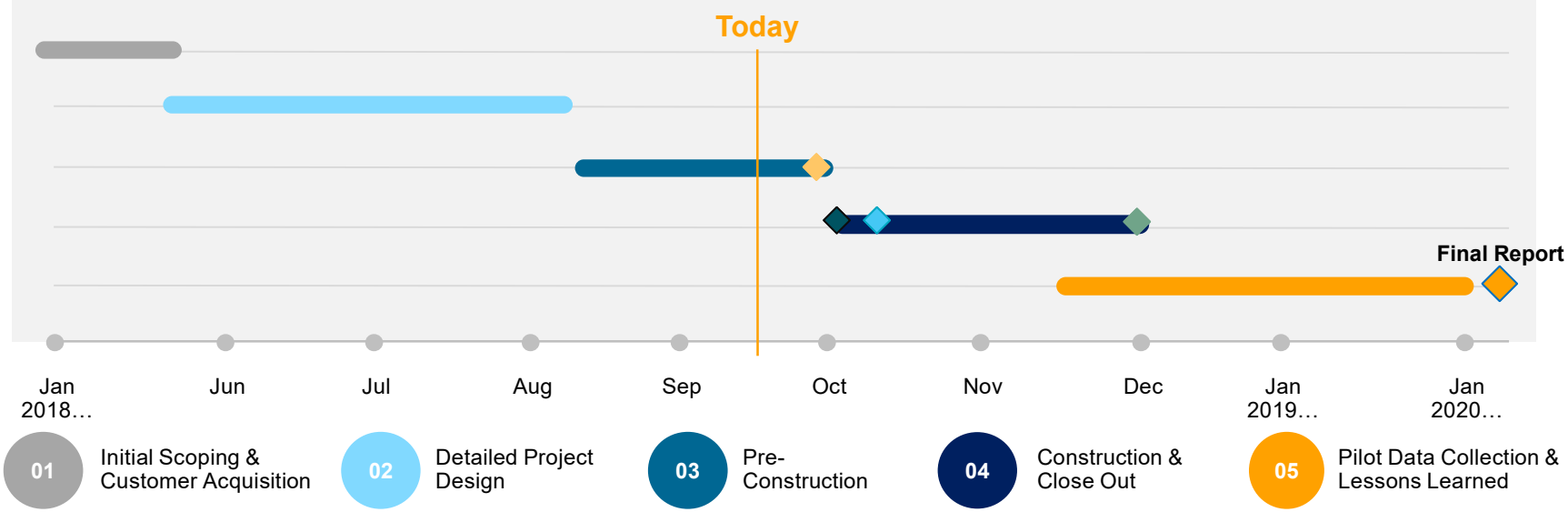
Project Scope

- Installing **9 Level 2 Chargers**
  - At 19kW each, about ~180kW total load
- Charge management software and platform to **optimize charging** for economics and GHG reductions
- Architecting **novel communications design** to integrate onsite renewables



Electric School Bus Renewables Integration

Pilot Project Construction and Data Collection Schedule



Key Upcoming Milestones

- Renewables Integration Platform SOW complete..... 9/22/2018
- Site construction begins.....10/01/2018
- Development work on platform commences.....10/08/2018
- Construction complete, chargers operational.....12/01/2018

High Level Pilot Goals

Optimize renewables with low TCO

Best practices for schools

Readiness for Fleet Ready Program

Home Charger Information Resource Pilot

Pilot Goals

1. **Empower customers to install residential charging through:**
   a) **Updating website and checklists:** Translating these resources into Spanish and Chinese to support DACs
   b) **Installer Tool:** 3rd party tool which empowers customers to find qualified contractors and compare costs with remote bids

1 Info & Survey

Customer completes survey with Installer Tool and photographs their panel

2 Contractor Review

Contractors review customer info and bid on the work remotely

3 Customer Selection & Install

Customer selects winning bid and contractor completes installation

Quick Facts

Market Segments
Residential

Implementation
Development to begin in Q4 2018. Increase adoption and spread awareness in 2019

Cost
$500,000

Business Model
Qualified contractors receive referrals from Installer Tool

Lessons Learned to Date

1 **Wide variability in MD/HD charging equipment available**

2 **Idle reduction remains an untapped opportunity**

3 **Each site requires custom analysis and design to best suit the customers' needs**

4 **Many schools and transit agencies have received or applied for grants for vehicles**

5 MD/HD charging technology is less mature than Light Duty/Level 2 charging

- No standard for eTRU ports currently exists
- Some charger manufacturers have long lead times for their chargers
- EV charger manufacturers are still developing software functionality

6 Charge management software is still developing and not plug and play

- Telematics data is not readily available, leading to less ability to optimize based on SOC/Duty cycle
- No off the shelf charge management solutions exist for any of the PRP pilots

7 Existing rates can create challenges in implementation

- Demand charges are an issue for SJV. At approx. $7K/month, they can be a limiting factor when considering large scale fleet electrification
- Idle reduction customer is a Direct Access customer, influencing their decision to build off of their infrastructure and maintain existing rate

8 Process Improvements Identified for Fleet Ready

- Utility and OEM partnerships will be important for customer recruitment and technology assistance
- Complete a preliminary land evaluation to determine where PG&E has easements
- Use ground penetrating radar to help locate chargers
- Involve distribution planning from the start

SB350
Standard Review Program

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FleetReady and Fast Charge Program Overview

Fast Charge

$22.3M to support deployment of public, DC fast charging plazas with utility-owned make-ready infrastructure.

234 DCFCs at 52 Sites Estimated program scale based on budget, though actual deployment will vary based developer applications.

25% of sites will be located in or adjacent to disadvantaged communities (DACs), with $25,000 charger rebates for DACs.

150kW minimum capacity to future-proof all make-readies, though site hosts can install lower-power DCFCs.

FleetReady

$236M to support make-ready charging infrastructure for medium/heavy-duty and non-road fleet vehicles.

700 sites and 6,500 vehicle targets to encourage a balance of larger and smaller sites.

25% of program infrastructure budget dedicated toward fleets located in DACs.

15% minimum of program infrastructure budget toward transit agencies, while forklift sites capped at 10% of infrastructure budget.

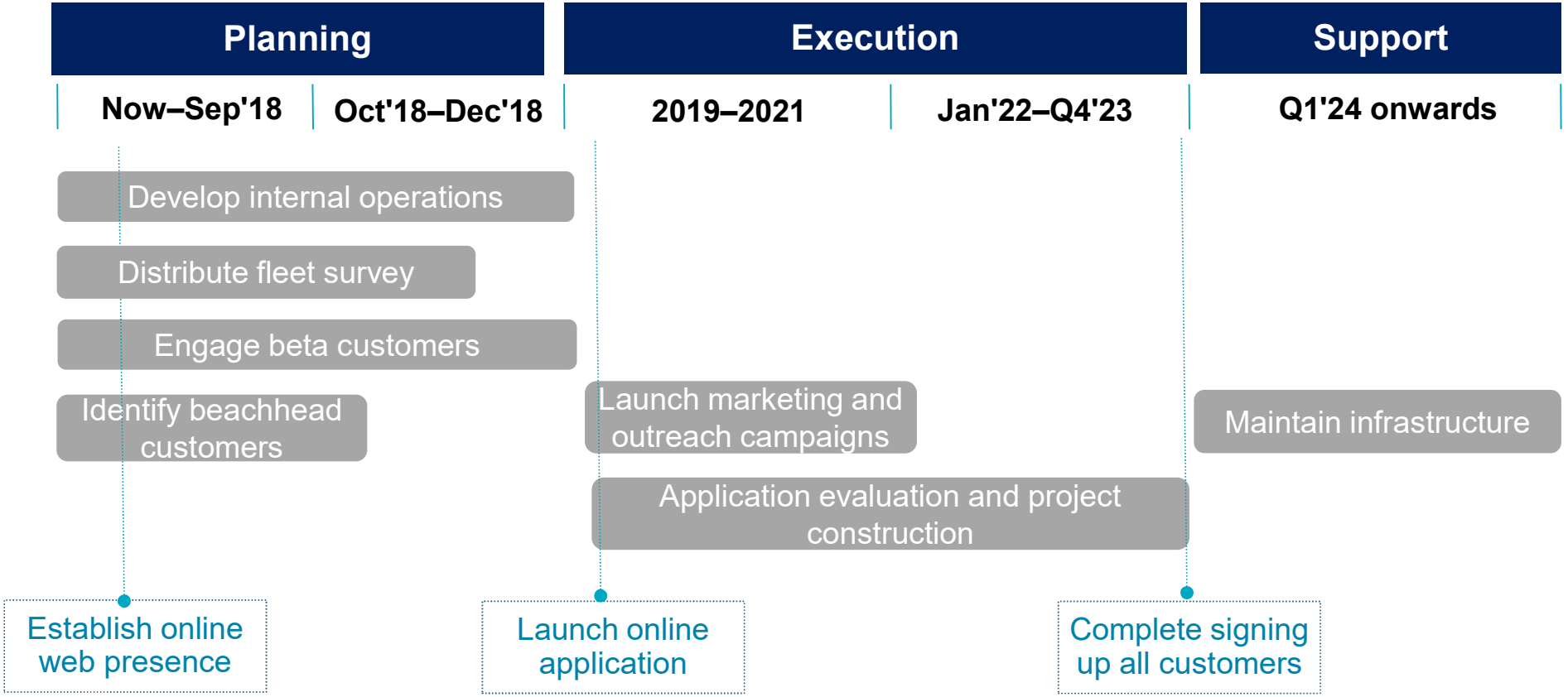
50% EVSE rebates for schools, transit agencies, and DAC sites.

+$10,350,000 for independent evaluation beginning in 2021

FleetReady Implementation Overview

Implementation Strategy

- Partnerships with automakers will drive applications to the FleetReady program, exploring the ability for PG&E to work with OEMs and educate customers on vehicles and charging options.
- Through the remainder of 2018, PG&E will focus on achieving operational readiness, confirming internal processes and developing IT functionality.



FleetReady Market Research

	Description	Vehicle Types	Availability	Low daily mileage	Low route variability	Known public commitments
1 BEACHHEAD	Vehicle segments with established markets, in best position to mainstream in the near term	 Transit  Yard  Local distribution	✓ Several OEMs currently producing models	✓ ~60% of trips <50 miles per day	✓ Many fixed routes for deliveries, buses, or in yard	✓ Many municipal bus commitments announced
2 SECONDARY	Vehicle types with existing early entrants requiring additional proof points	 Long haul freight  Industry	— Limited availability currently, but announcements	— Very long routes for Long Haul sector	✓ Many fixed routes	✓ Many private sector industry committing to sustainability
3 HORIZON	EV potential, but requires significant investment and development to become viable	 Emergent (e.g. Marine, rail)	— Very limited current and planned releases	— Very long routes for many use cases	✓ Several fixed routes for ferries or rail	— Few commitments given lack of vehicles

FleetReady Customer Acquisition Approach

Beachhead Sectors

- Conducted extensive market research to identify customers within three identified beachhead sectors: **transit, yard, local distribution**. These sectors were selected based on:
  - **Vehicle availability**
  - **Low daily vehicle mileage**
  - **Existence of mandates and commitments**

Transit

Yard

Local distribution

Beta Customers

- Engaging a number of beta customer to discuss and test program design elements such as contracts, fleet operations, infrastructure ownership preferences, construction considerations, timing, and key areas for PG&E support
- Goal is to have construction begin with beta customer sites in early 2019

FleetReady Website and Survey

www.pge.com/fleetready

FleetReady Program Implementation Progress

96 expert interviews conducted with fleet operators

11 OEMs and dealers engaged in partnership strategy discussion

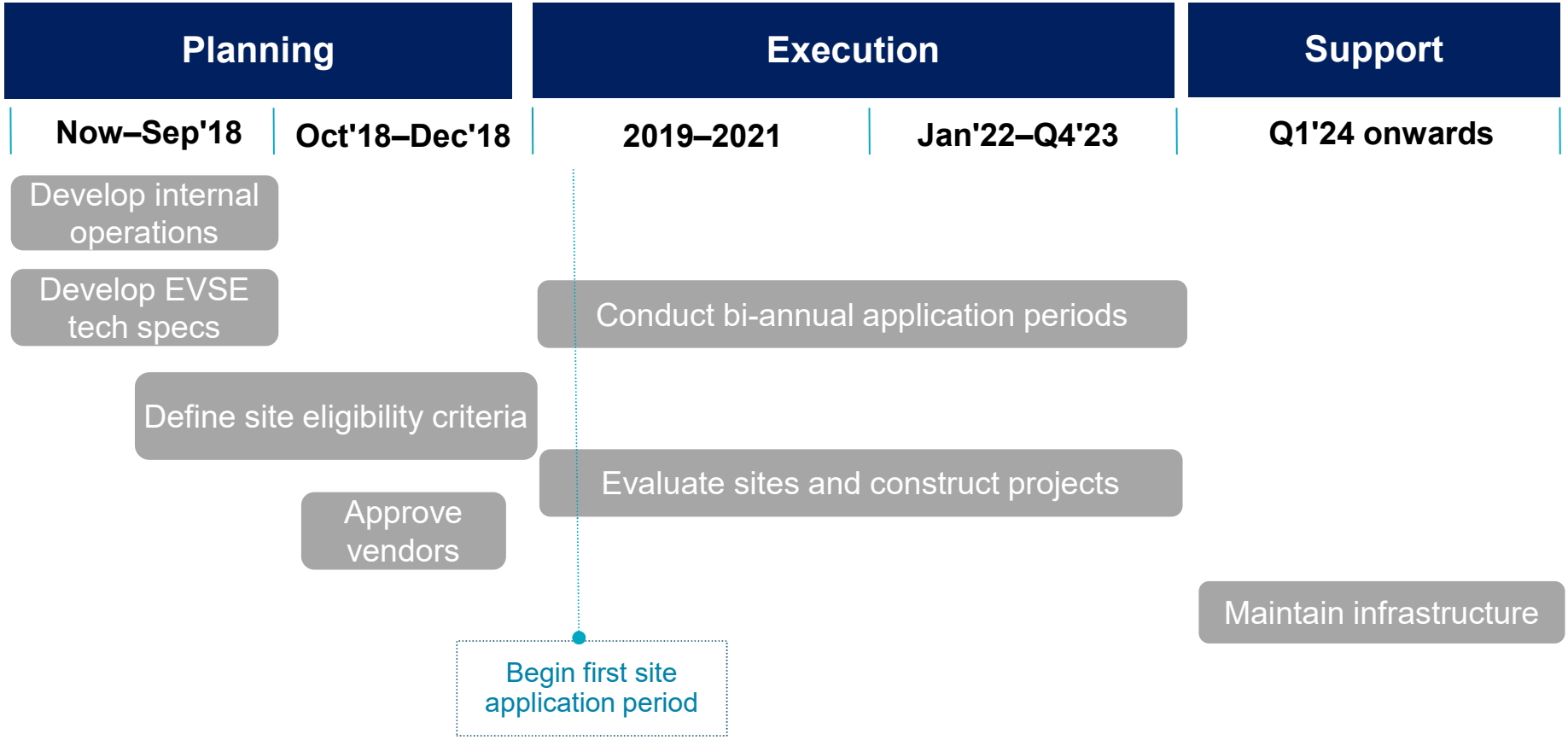
20+ OEMs and dealers expressed interest in partnering

- In Q3, PG&E launched a website for the FleetReady program consisting of a customer contact form
- Interested customers can submit their information and PG&E will log these customer as interested in program participation
- PG&E has also developed a survey to help PG&E better understand fleet customers and inform program design based on responses which will be distributed to these customers expressing interest

Fast Charge Implementation Overview

Implementation Strategy

- PG&E will qualify EVSE vendors to identify sites to apply to the Fast Charge program
- Submitted sites will be evaluated for participation based on alignment with defined site criteria and program goals



Fast Charge Customer Acquisition

Establish participation criteria

1. Define site eligibility criteria (i.e. high utilization, public access, geography)
2. Qualify EVSE vendors based on specified technical requirements, similar to the EVCN RFQ process
3. Share site eligibility criteria with approved vendors

Site Procurement

The following steps will occur on a bi-annual basis

4. Invite approved vendors to go to market to find qualified sites
5. Approved vendors submit qualified sites to PG&E through online application
6. PG&E will evaluate sites for eligibility and technical feasibility

Areas for SB350 SRP PAC Feedback

Topic	Timeline per Decision
FleetReady	
Establish EVSE rebates for DAC, transit, school bus	Prior to program implementation
Verify 80% incentive for customer-owned infrastructure	Prior to program implementation
DAC adjacent applicability	Not directed by Decision
Financially fit definition	Not directed by Decision
Evaluate rebates (EVSE, customer-owned infra.)	Annually
Assess program for per se reasonableness budget modifications	After 2 years of program implementation
Any program modifications	Any time during implementation
Fast Charge	
EVSE rebate amount	Prior to program implementation
Define DAC "adjacent"	Prior to program implementation
Develop survey to determine impact on MUD customers	No specific timeline directed
Both	
Safety Requirements	No later than 18 months after Decision approval date (Nov. 31, 2019)
Meeting cadence	Ongoing

Defining DAC adjacent

- For **Fast Charge**, the Final Decision incorporates DAC "adjacent" to apply to sites qualifying for DAC status
- We are considering defining DAC adjacent as those sites with a **physical address in a ZIP code that contains a DAC census tract,** as discussed in CARB's 2014 "Investments to Benefit Disadvantaged Communities" draft report.
- Interest in applying this definition to **FleetReady**

Investments to Benefit Disadvantaged Communities
Senate Bill 535 (De León, Chapter 830, Statutes of 2012)

Cap-and-Trade Auction Proceeds
Interim Guidance to Agencies Administering Greenhouse Gas Reduction Fund Monies

REVISED DRAFT
Proposed revisions in underline/~~strikeout~~

Release Date: August 22, 2014
Comments Due: September 15, 2014
Board Consideration: September 18, 2014

California Environmental Protection Agency
Air Resources Board

Defining “financially fit”

CPUC Decision

OP 38. “Pacific Gas and Electric Company and Southern California Edison Company must ensure participating customers in either the Fleet Ready or Medium- and Heavy-Duty Vehicle Charging Infrastructure Programs be financially fit to participate.”

PG&E Approach

For the purposes of FleetReady, PG&E will assume that a vehicle PO will mean site is financially fit.

- Upfront cost of a MD/HD EV is highest cost of ownership
- Operating a conventional vehicle is more expensive than an EV

Based on past success with on-bill financing measures to capture customer eligibility, PG&E is considering implementing a payment history check to determine financial fitness

FleetReady EVSE Rebate

CPUC Decision

"Utility investments in make-ready infrastructure to serve the medium- and heavy-duty transportation sector within the adopted budget will be considered per se reasonable provided:

- *rebate levels for transit and school bus EVSE are established in consultation with the utility's respective PAC. Rebate levels should not exceed 50 percent of the charger cost;*
- *rebate levels for EVSE installed at sites in DACs are established in consultation with the utility's respective PAC. Rebate levels should not exceed 50 percent of the charger cost"*

Decision 18-05-040, *6.5 Program Modifications and Summary of Adopted Program*, pg 104-105

PG&E Approach

PG&E is proposing to determine a base cost for three tranches of charger power levels, and use 50% of the base cost as the total rebate amount cap for each tranche of charger categories. Base cost amounts will be evaluated as real data is received, and adjusted in conjunction with PAC as needed.

Power output	Base cost	Rebate for eligible customers
Up to 50 kW	$35,000	50% of the cost of EVSE, up to $17,500
51-150 kW	$46,000	50% of the cost of EVSE, up to $23,000
150+ kW	$77,000	50% of the cost of EVSE, up to $38,500

FleetReady Customer-owned Infrastructure Incentive

CPUC Decision

OP 39. "Pacific Gas and Electric Company and Southern California Edison Company must allow customers the choice of whether to own, operate, and maintain infrastructure installed behind the customer's meter. If the customer chooses ownership... The utility shall provide a rebate to the customer for customer-side infrastructure the customer installs that is the lesser of: (a) 80 percent of customer's actual installation costs or (b) 80 percent of the average utility direct cost for installing the customer-side make-ready infrastructure in the relevant sector…"

PG&E Approach

Options will be discussed at an off-cycle PAC meeting in October focused on rebates and incentives. We welcome ideas and input in establishing the rebate and incentive amounts.

Fast Charge EVSE Rebate for DAC

CPUC Decision

OP 25. "Pacific Gas and Electric Company may offer site hosts located in Disadvantaged Communities a maximum rebate of $25,000, not to exceed the full cost of the Electric Vehicle Supply Equipment and installation costs to be applied to each Electric Vehicle Supply Equipment purchase."

PG&E Approach

PG&E will offer a $25,000 EVSE rebate for Fast Charge participants located in disadvantaged communities as authorized in the Decision.

Site in DAC → **$25,000** per EVSE 

Discussion