

# EV Charge Network Program Advisory Council

October 13, 2017



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# Agenda

<b>Safety</b>	<b>9:00-9:05</b>
<b>Introductions</b>	<b>9:05-9:20</b>
<b>Recurring Program Updates:</b>	
<b>Market Update</b>	<b>9:20-9:30</b>
<b>Marketing, Education, and Outreach</b>	<b>9:30-9:45</b>
<b>Site Selection and Construction</b>	<b>9:45-10:05</b>
<b>Procurement</b>	<b>10:05-10:35</b>
<b>Load Management</b>	<b>10:35-11:15</b>
<b>Base Cost Revisions</b>	<b>11:15-11:45</b>
<b>Roundtable</b>	<b>11:45-12:00</b>

# EV Charge Network Market Update



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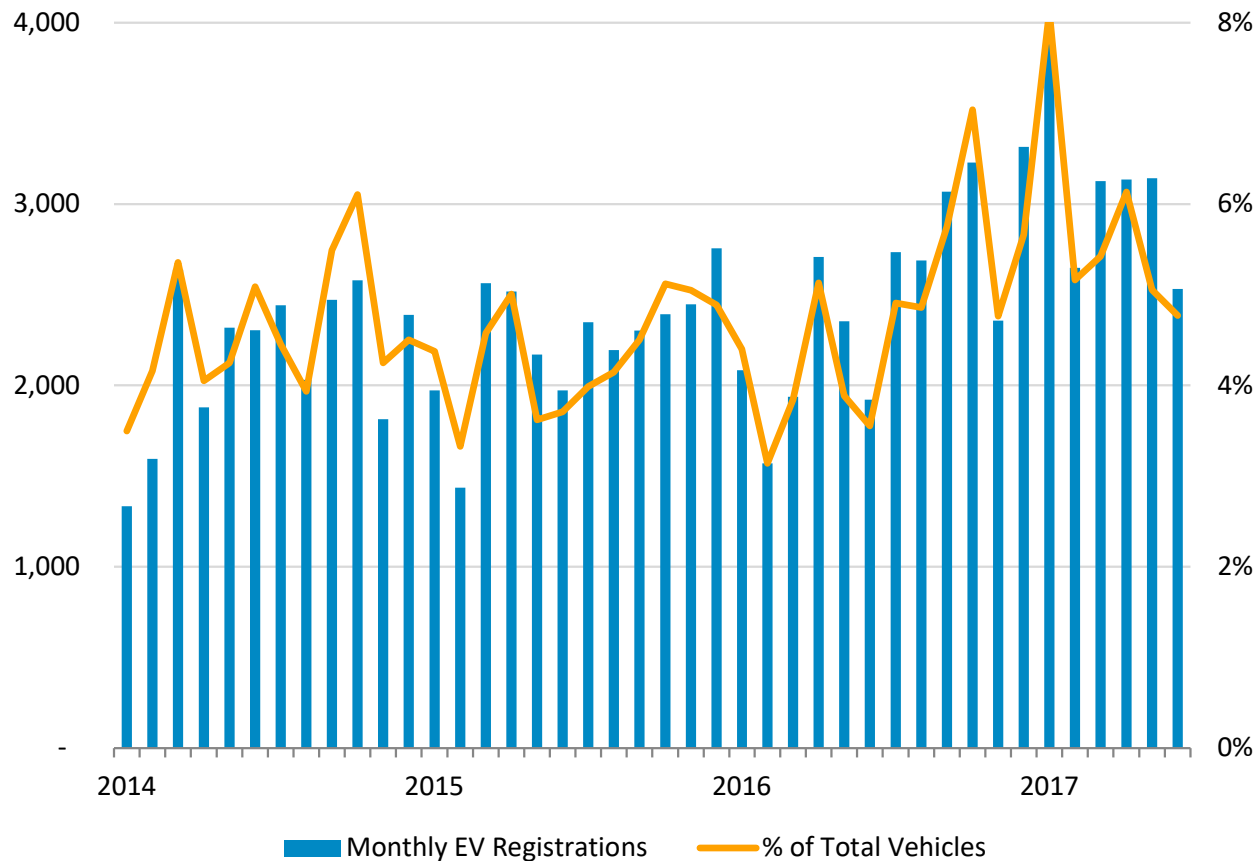


# EV registration growth

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

Monthly EV Registrations – PG&E Service Area



Monthly EV registrations have averaged **3,000 units** in 2017, up 50% over the first half of 2016.

EVs outsold traditional hybrids for the first time in the first half of 2017.

EV Market Share in PG&E's Service Territory has trended around 6% of new vehicle registrations



# EV offerings continue to expand each month

## EV Models Released by Model Year



2011

- Volt
- LEAF
- Tesla Roadster
- Fisker Karma



2013

- Volt Spark EV
- LEAF
- Tesla Model S
- C-Max Energi
- Fusion Energi
- Focus Electric
- Plug-in Prius
- RAV4 EV
- Mitsubishi iMiEV
- Smart ED
- Accord Plug-in
- Fit EV
- 500e



2017

- Bolt
- Volt
- LEAF
- Tesla Model 3
- Tesla Model S
- Tesla Model X
- C-Max Energi
- Fusion Energi
- Focus Electric
- Prius Prime
- Outlander Plug-in
- Smart ED
- 500e
- i3
- i8
- X5 xDrive e40
- 330e
- 530e
- 740e
- Panamera
- Cayenne S E
- Porsche 918 Spyder
- ELR
- CT6
- B-Class ED
- S550e
- C350e
- GLE 55e
- Soul EV
- Optima PHV
- e-Golf
- Sonata PHV
- Ioniq
- XC60
- XC90
- A3 e-tron
- Pacifica Hybrid
- Clarity
- Mini Countryman

## Passenger Vehicles:

- 37 EV models currently available in CA; likely doubling by 2021.
- New Chevy Bolt, Tesla Model 3 and Nissan LEAF – 200+ mile range at under \$30,000 after incentives
- Volvo will no longer sell ICE-only vehicles by 2019; Jaguar will offer electric version of every model by 2020
- Battery price declines should enable EV cost parity with ICEs between 2025-2030

## Medium & Heavy Duty:

- Many MD/HD EV models are upfit on ICE platforms
- Transit & School bus are early areas with OEMs building EV from the ground up (Proterra, BYD, Lion)
- Chanje Energy is launching an all-electric delivery/shuttle van this year with Ryder

# EV Charge Network

## Marketing, Education and Outreach

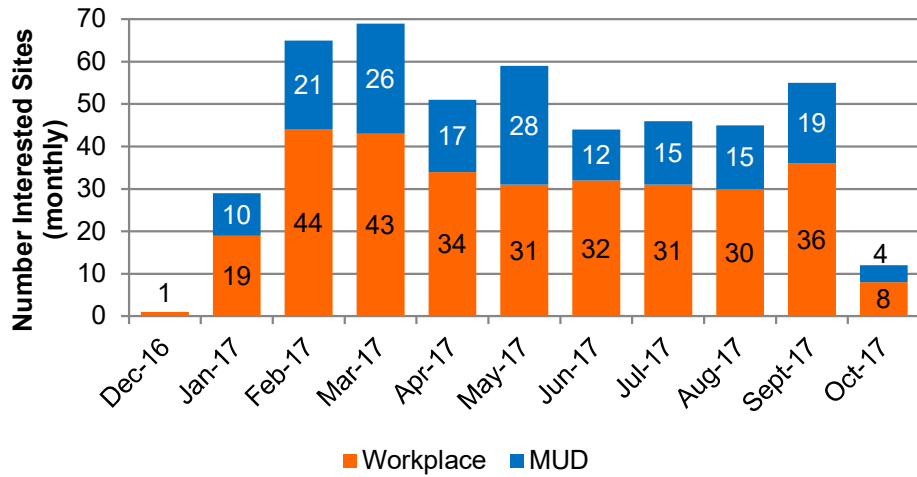


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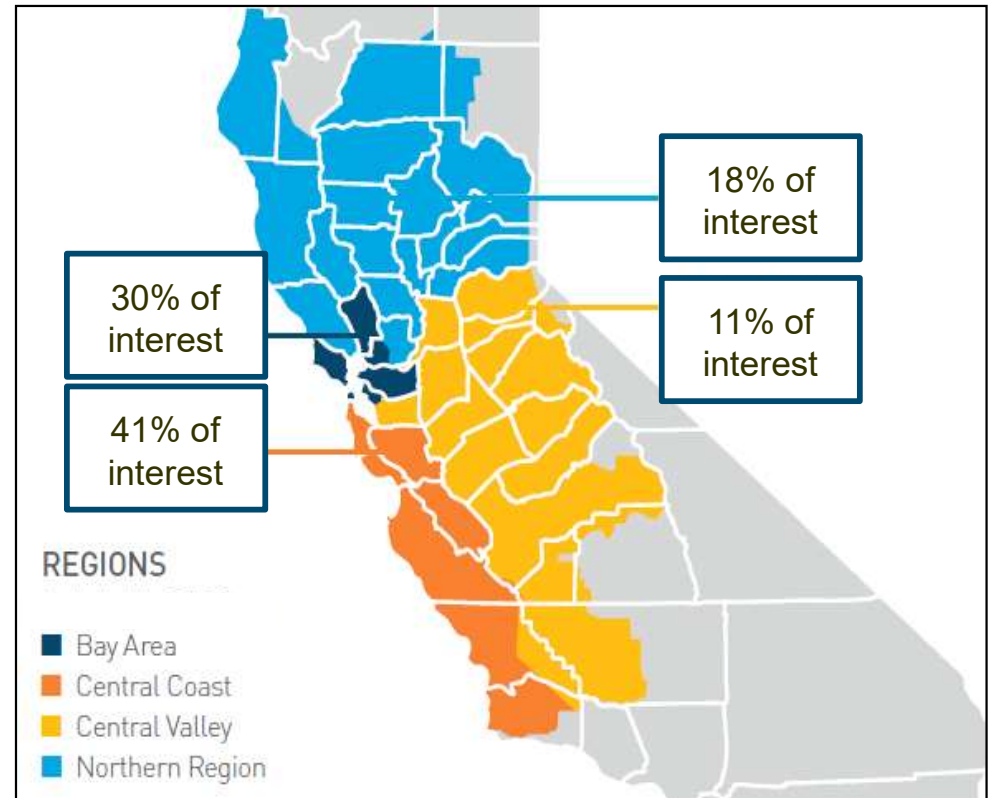


# Initial online site host interest in EV Charge Program focused in two key regions

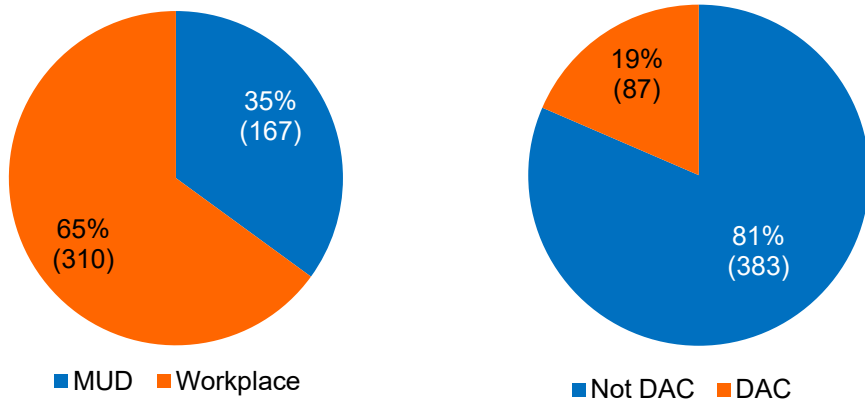
### Cumulative Registrations



### Interest by Region



### Interest by Site Type





# Community Choice Aggregator EV Forum

## Background

In August 2017 PG&E met with Community Choice Aggregators to share knowledge about EV programs and discuss potential collaboration on the EV Charge Network (EVCN).

## Attendees

Eight operating and future CCAs serving nearly 1 million customers in nine counties:

- CleanPowerSF
- MCE Clean Energy
- Peninsula Clean Energy
- Redwood Coast Energy Authority
- San José Community Energy
- Silicon Valley Clean Energy
- Sonoma Clean Power
- Valley Clean Energy Alliance

## Topics discussed

- PG&E's EV Charge Network overview
- Redwood Coast Energy Authority and Sonoma Clean Power EV programs
- Collaboration opportunities between CCA's and PG&E

## Outcomes / next steps

- Partner with CCA's to identify viable sites for EVCN program
- Develop material to assist CCA's in qualifying sites
- Check in periodically to share lessons learned
- Include CCA's in PAC meetings





# Third Party Outreach

## Overview

A key tactic in promoting the EVCN program will be collaborating with 3<sup>rd</sup> party partners. This is a win for partners who can use the EVCN program to deepen relationships with their customers or constituents, and a win for PG&E as more participants join.

Sample partners include:

- Community Choice Aggregators (CCAs)
- EVSPs
- Automakers
- Non-profits
- Trade associations

## Engagement process

PG&E provides talking points and prequalification criteria to 3<sup>rd</sup> party partners.

Partners engage viable sites, prequalify them using criteria, and encourage them to apply via website.

PG&E and partners share lessons learned. PG&E provides additional resources as needed.



# Website launch – 10/20

## Design principles

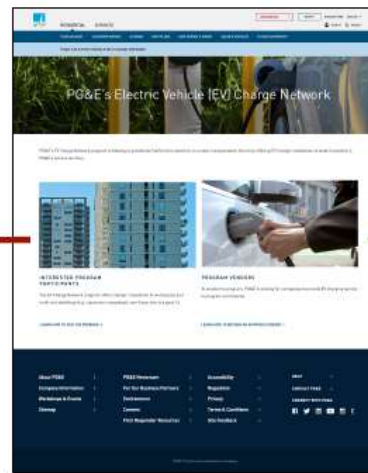
**Organize by audience:** participant or vendor

**Cascade detail down:** start high level, add detail as user navigates deeper into site

**Keep it simple:** avoid jargon, keep content user friendly and visual wherever possible

### Participant home

- About the program
- Get started
- Rates & billing
- Vendor list
- Resources
- FAQ



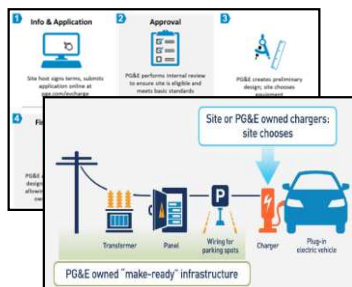
- Main homepage**
- Participant home
  - Vendor home

## Key content

- Program information (e.g., ownership options, costs, key features)
- Online application
- List of qualified vendors
- Supporting collateral (e.g., terms and conditions, sample easement)

### Vendor home

- About the program
- Get started
- Resources
- FAQ



Sample – “About the program” graphics

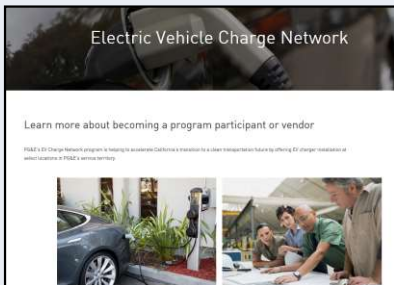


# Marketing and outreach next steps

2017

October

Launch website (10/20)  
  
Launch email campaign to sites that have registered interest (end of October)



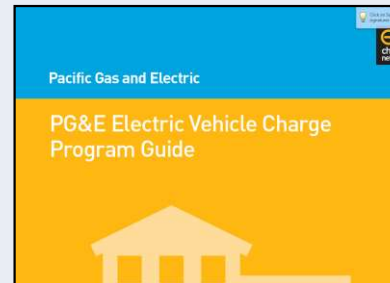
November

Customer research (round 2)  
  
Public announcement of program



December

Additional marketing material for 3<sup>rd</sup> party partners (e.g., sales collateral)

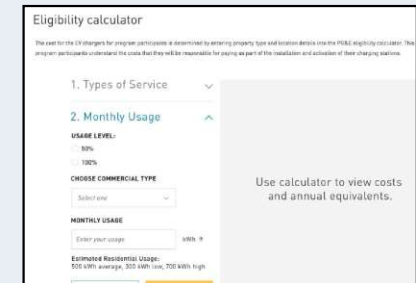


2018

January

Official program launch  
  
Website round 2 updates (select items):

- General public section
- Cost calculator
- Vendor page search functionality



# EV Charge Network

## Site Selection and Construction



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# Potential trial sites cover market segments, physical criteria and prior engagement with PG&E

## **In total 54 locations identified as likely trial sites of which:**

- 56% (30) are workplaces
- 44% (24) are multi-unit dwellings
- 17% (9) are in disadvantaged communities

## **Of the total 54 locations identified:**

- 54 potential trial sites have been considered out of which 37 have been waitlisted, 17 remaining sites include:
  - 2 are currently in the vetting process (environmental review/service review/site walk/prelim design/ROM Calculations)
  - 15 (184 ports) have been confirmed as trial sites and have proceeded to final design.
  - 2 terms and conditions signed



# 54 potential sites have been considered, 15 have proceeded to final design (184 Ports)

Trial Site Number	Region	Program Option	Site Type	DAC Status	# of Ports	Terms and Conditions Received	Final Design Complete
Site 1	SOUTH BAY	Owner	Work Place	NON-DAC	12	X	X
Site 2	GREATER SACRAMENTO	Owner	Work Place	DAC	12	X	X
Site 3	GREATER SACRAMENTO	Owner	Work Place	NON-DAC	10		X
Site 4	SOUTH BAY	Owner	Work Place	DAC	12		X
Site 5	EAST BAY	Owner	Work Place	DAC	10		
Site 6	NORTH BAY	Owner	MUD	NON-DAC	12		
Site 7	CENTRAL COAST	Owner	Work Place	NON-DAC	10		
Site 8	SOUTH BAY	Owner	Work Place	NON-DAC	10		
Site 9	SOUTH BAY	Owner	Work Place	NON-DAC	19		
Site 10	SAN FRANCISCO	Sponsor	MUD	NON-DAC	22		
Site 11	EAST BAY	Owner	Work Place	DAC	15		
Site 12	SOUTH BAY	Owner	MUD	NON-DAC	10		
Site 13	EAST BAY	Owner	MUD	NON-DAC	10		
Site 14	EAST BAY	Sponsor	MUD	NON-DAC	10		
Site 15	CENTRAL COAST	Sponsor	MUD	NON-DAC	10		



# Updated site construction schedule now planned for Q1 2018

## **Complexity of program terms and conditions**

- Length and complexity of program terms and conditions a challenge to finalizing site host participation

## **High interest in EV Charge Sponsor option**

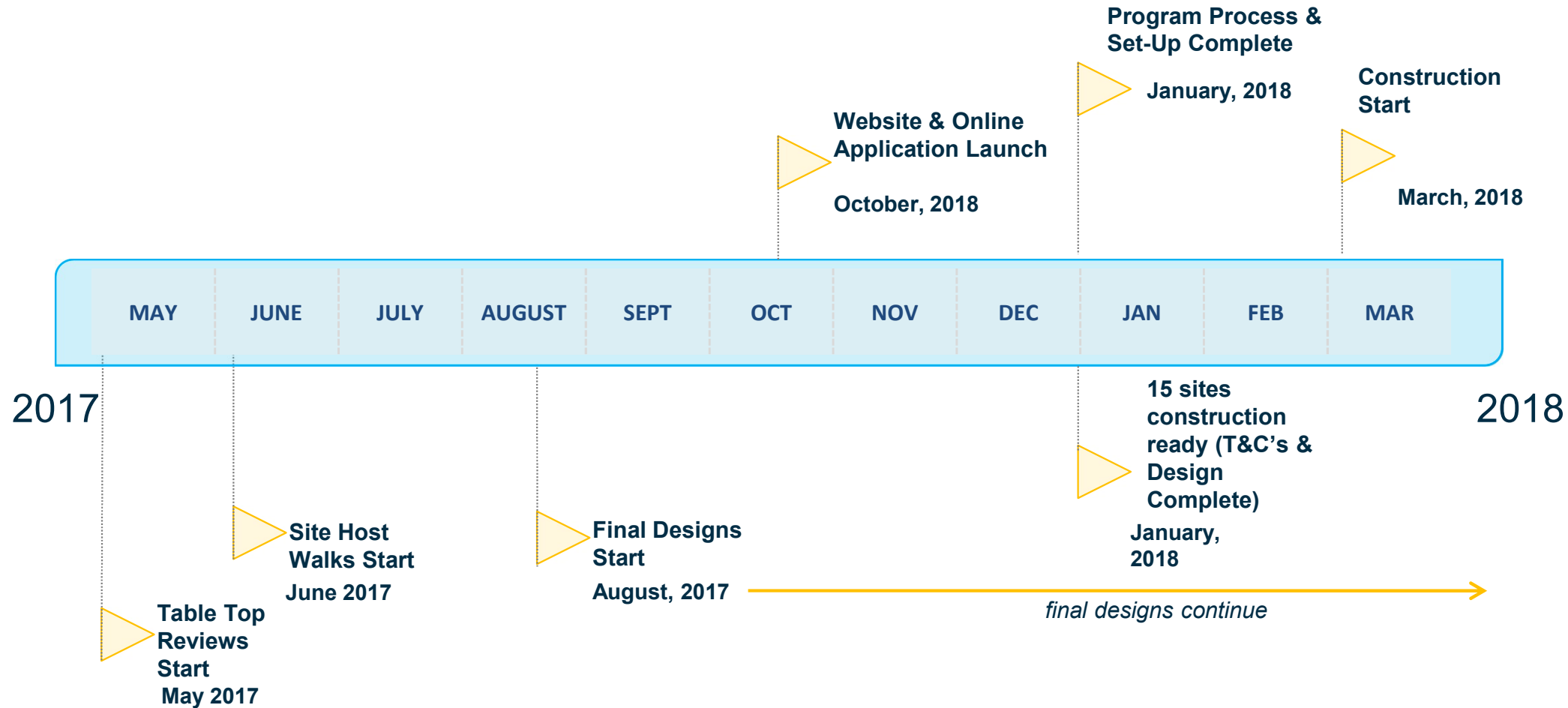
- Many trial site hosts (MUDs) are interested in the EV Charge Sponsor Option but are hesitant to sign on until PG&E equipment solicitation has been completed.

## **Lower installation costs by grouping site hosts and selecting approved installation vendors**

- Potential to receive more competitive pricing via a construction RFP and grouping installs by geography



# Updated timeline to construction estimates breaking ground in Q1 2018



Purpose of trial site work is to stress-test program processes and assumptions, and ensure program is ready for planned go-live





# EPC Contracting Strategy includes a 3 – step process

## **Contract Award Announcement**

- Description of procurement process and outlines Engineer Procure Construct services for the Program.
- Released September 11<sup>th</sup>.

## **Request for Information (RFI)**

- Intended to evaluate the qualifications of suppliers interested in providing EPC services on the future Electric Vehicles Charge Network RFP.
- Released September 25<sup>th</sup>.

## **Request for Procurement (RFP)**

- Intended to receive competitive price proposals for supplier EPC services that meet PG&E's requirements.
- Criteria will include an evaluation of price, quality of bid, safety, supplier diversity, environmental commitment and financial stability.
- PG&E intends to award a contract to a more limited number of suppliers than those qualified through the RFI.
- Expected release date – November 2017.

# EV Charge Network Procurement Update



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# Procurement Process Overview

## Overall Procurement Goal:

Select EVSE Package(s) – inclusive of EVSE hardware, software, and network services – from Suppliers for the EVCN Program.

## 2-Step Procurement Process:

### Step 1 – Request For Qualifications (RFQ)

- EV Charge Owner option of the Program.
- All EVSE Package(s) that meet minimum requirements qualified.
- # Suppliers qualified will not be restricted.

### Step 2 – Request for Proposal (RFP)

- EV Charge Sponsor option of the Program.
- Successful participation in Step 1 is mandatory for participation in Step 2.
- Suppliers will not be required to participate in Step 2.
- PG&E intends to award a contract to a more limited # of suppliers than identified in Step 1.



# RFQ 1 Results

## Summary stats:

15 vendors are approved for the EV Charge Owner Program

- Andromeda Power LLC
- BTCPower
- ChargePoint
- EV Box North America
- EV Connect
- EVoCharge LLC
- EVSE LLC
- Shell
- Greenlots
- Kitu Systems
- Oxygen Initiative
- Liberty Plug-Ins
- SemaConnect
- Tellus Power
- Verdek





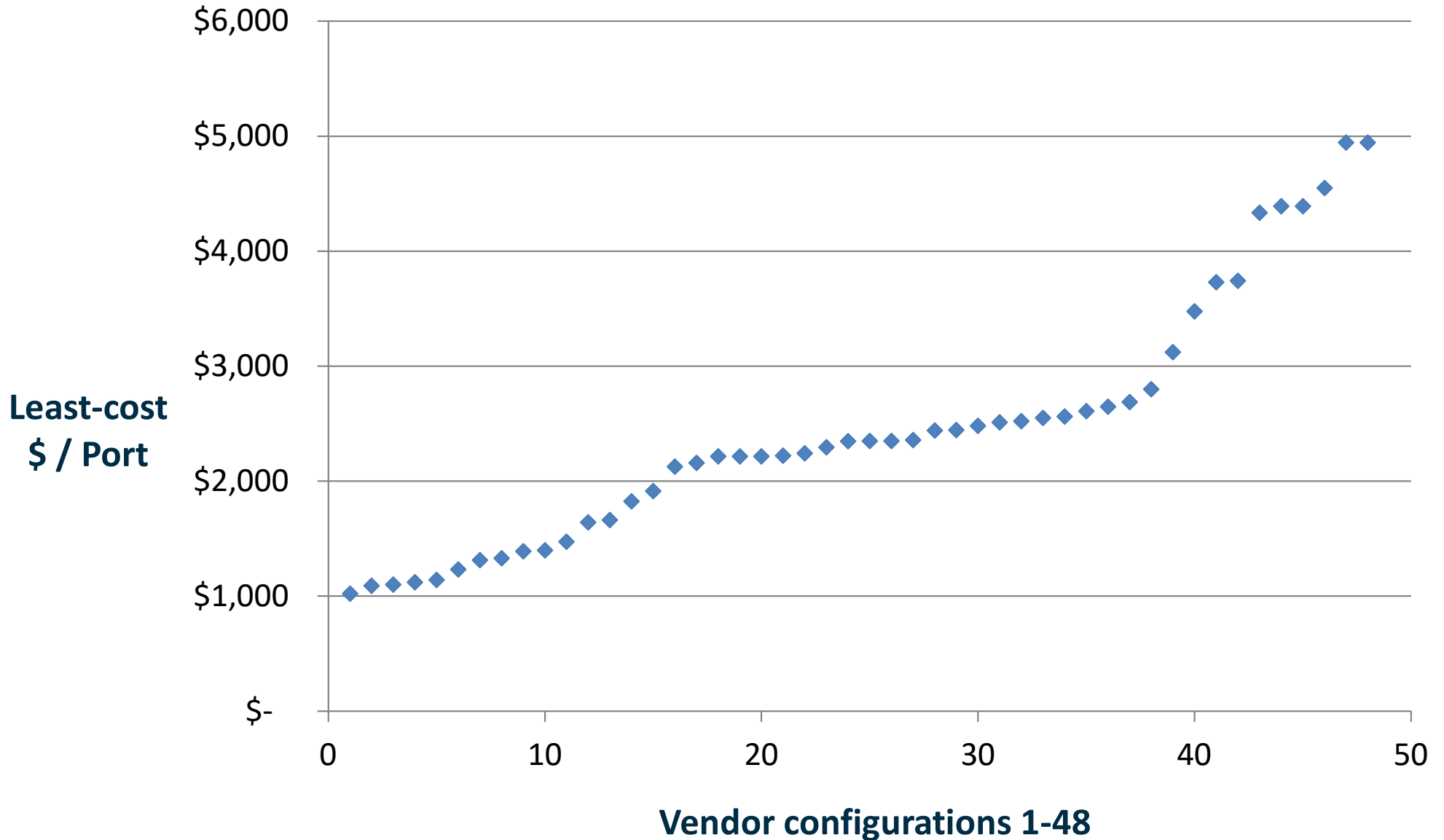
# RFQ 1 Approved EVSE Samples





# RFQ 1 Hardware Prices Reported

Vendor prices for least-cost units and 3 yr. warranty:





## RFQ 1 Data Shared with Trial Site Hosts

**PG&E has shared the following information with Trial Site Hosts to aid them in the selection of EVSE for the Charge Owner Option:**

- Primary vendor Name
- Vendor Contact info
- Vendor Website
- EVSE Manufacturer
- EVSE Management Provider
- Approved EVSE Models
- Approved Software
- Approved EVSE Description (provided by vendors)
- RFQ Qualification Date
- Vendor's least-cost hardware and 3 year warranty cost

This information will be shared publicly via the website once launched, it has been shared with Trial Sites via PDF as an intermediate solution.

Approved vendors may begin marketing the program once the website is launched and the base charger cost is established for Site Hosts to calculate rebates.



# Procurement Timeline – RFP



## RFP Timeline – EV Charge Sponsor

Release of RFP	September 8, 2017
RFP Bidder Conference Call	September 15, 2017
RFP Submission due	October 9, 2017
Evaluation of Submissions	October 9 – 30, 2017
RFP Interviews / Equipment Testing (as necessary)	October 30 – November 20, 2017
Estimated Notification of Selected Vendors	November 21, 2017





# Procurement Timeline – RFQ 2



## RFQ 2 Timeline – EV Charge Owner

Contract Opportunity Announcement	September 15, 2017
Release of RFQ	September 29, 2017
RFQ Submission due	October 30, 2017
Notification of Approved Vendors	November 30, 2017

# EV Charge Network Load Management Plans



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# CPUC decision established two pricing options, both require a load management plan

	<b>Pass through</b> (previously Rate-to-Driver)	<b>Custom</b> (previously Rate-to-Host)
<b>Pricing for driver</b>	Site host mirrors the PG&E time-of-use (TOU) rate and passes it directly to drivers	Site host creates their own pricing structure (e.g. free, flat rate, etc.)
<b>Load management</b>	TOU rates send a price signal to shift charging behavior	Site host must submit a <b>load management plan</b> to PG&E

→ PG&E is determining what “load management” is for the EV Charge Network and how to implement it



## The CPUC decision established two pricing options for site hosts, both with a load management plan

1. PG&E discussed load management plans at the Q2 Program Advisory Council meeting on June 14 and in a meeting with EV Service Providers (EVSPs) on June 29.
2. PG&E requested feedback from the PAC members and EVSPs on possible frameworks for Load Management Plans in the EV Charge Network program.
3. 13 PAC members and EVSPs provided comments on load management goals and potential load management program frameworks.



# Load management goals focus on supporting the grid , customer choice and driver preferences

PG&E presented the following goals for its load management program:



## Grid

- Integration of variable renewable energy resources
- Support of the electric distribution system



## Customer

- Customer choice
- Fuel cost savings
- Easy for site host to understand/implement



## Innovation

- Innovation in the EV charging market
- Inform future development of vehicle-grid integration



# Summary of PAC and EVSP feedback on load management goals



## Grid

- “Pilots or programs [should] shift load away from the distribution peak”
- “Grid security and balancing should take priority over individual site load management”



## Customer

- “For any DR program to succeed, we need to be able to minimize the impact [on] drivers”
- “The most important goal of transportation electrification programs should be to reduce the cost of owning and operating electric vehicles”



## Innovation

- “As a technology company, innovation is the most important goal”
- “An easy to understand, cost-saving program with consumer choice will drive the success of Grid and Innovation goals”



# Summary of PAC and EVSP feedback on load management frameworks

## PG&E presented a few existing DR programs:

- Peak Day Pricing
- Supply Side Pilot
- Excess Supply Pilot

## Comments on using traditional DR events:

- Events are **too long** for EV charging—one to two hour events are needed
- EV charging at individual sites is not enough to meet minimum resource requirements

## Comments on creating a new load management program for EVCN:

- Most commenters agreed that a new load management framework is necessary. Goals for a new program framework should include:
  - **Shorter** event times
  - **Ample warning and site host flexibility** to avoid inconveniencing drivers
  - **Sufficient incentives and/or penalties** to encourage participation
  - Testing and valuing program's **peak shifting ability**

# Feedback on load management strategies



## Informational:

Site host provides information to the EV drivers at its site to encourage behavioral change

- Fits goal of not inconveniencing drivers, but may not be effective
- Educating drivers about load management is nevertheless vital



## Command/control:

Site host enforces response at its charging stations

- Can be effective for load reduction events by shifting load away from distribution peak, but can adversely impact drivers
- May not be effective for events that call for increased EV charging



## Financial:

Site host changes pricing at its charging stations for EV drivers to influence response

- Most popular option
- Commenters agreed on the importance of incentives for increasing charging
- Disagreement on if drivers should be penalized for charging during load reduction times

→ Commenters also expressed that load management will be most effective when all three strategies are used together.





# Feedback on implementation

Most participating EV service providers (EVSPs) can:

- Aggregate load in order to meet minimum resource requirements
- Implement strategies to manage load, such as curtailment, pricing adjustment, driver messaging, and scheduled charging.



# Proposed program focuses on load shifting, increasing and decreasing demand based on grid conditions

PG&E proposes to use a new load management framework specifically for PG&E's EV Charge Network.

A new load management program will use two types of events:



Shift EV charging to increase site load at times when there is excess supply/overgeneration of renewables



Shift EV charging to decrease site load at peak times to support system reliability



## Next steps

- PG&E is evaluating the potential for creating a new framework for load management in the EV Charge Network (outside of existing DR programs), that would shift load in both directions (increase EV charging and decrease EV charging) at certain times in response to grid/market conditions
- PG&E is currently looking at event triggers, incentive amounts, the settlement process, and funding.
- PG&E plans to present its proposal for load management at the Q4 PAC Meeting.

# EV Charge Network

## Revised Base Cost Method



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# Base Cost Background and Key Questions

## Background

From the decision: “base cost” for EVSE shall be “based on the price of the lowest cost Electric Vehicle Supply Equipment model qualified through the Request for Proposal process and the resultant base cost must be used to determine rebate and participation payment amounts.”

## Key Questions

- **Is “lowest cost” the best method?**
  - Lowest price produces low rebate not aligned with market averages
  - Does not account for gateway costs to create a functional project
  - Recommend 10-port pricing technique
- **Is RFP the best data?**
  - Smaller final dataset
  - PG&E prices may not align with market prices
  - Recommend RFQ base-cost data



# RFQ yielded 18 hardware options with 250+ sub models with varying features

## Summary of RFQ results

- 15 Qualified Primary Vendors for EV Charge Owner option
- 12 unique hardware manufacturers
- 18 unique family models (specific hardware options)
- 250+ sub-models varying by:
  - single/dual
  - ground/wall
  - RFID reader
  - GPRS model
  - screen
  - length of cables (18ft/25 ft. )
  - cable retractor



# Base cost analysis background

## **RFQ yielded many models, varying in price**

- Collected 250+ prices from the RFQ for a variety of models and configurations

## **Second round request for information to normalize lowest cost**

- Received least-cost configurations from vendors for 10 ports (this addresses gateway costs for a site deploying 10 and constricts vendor's pricing)

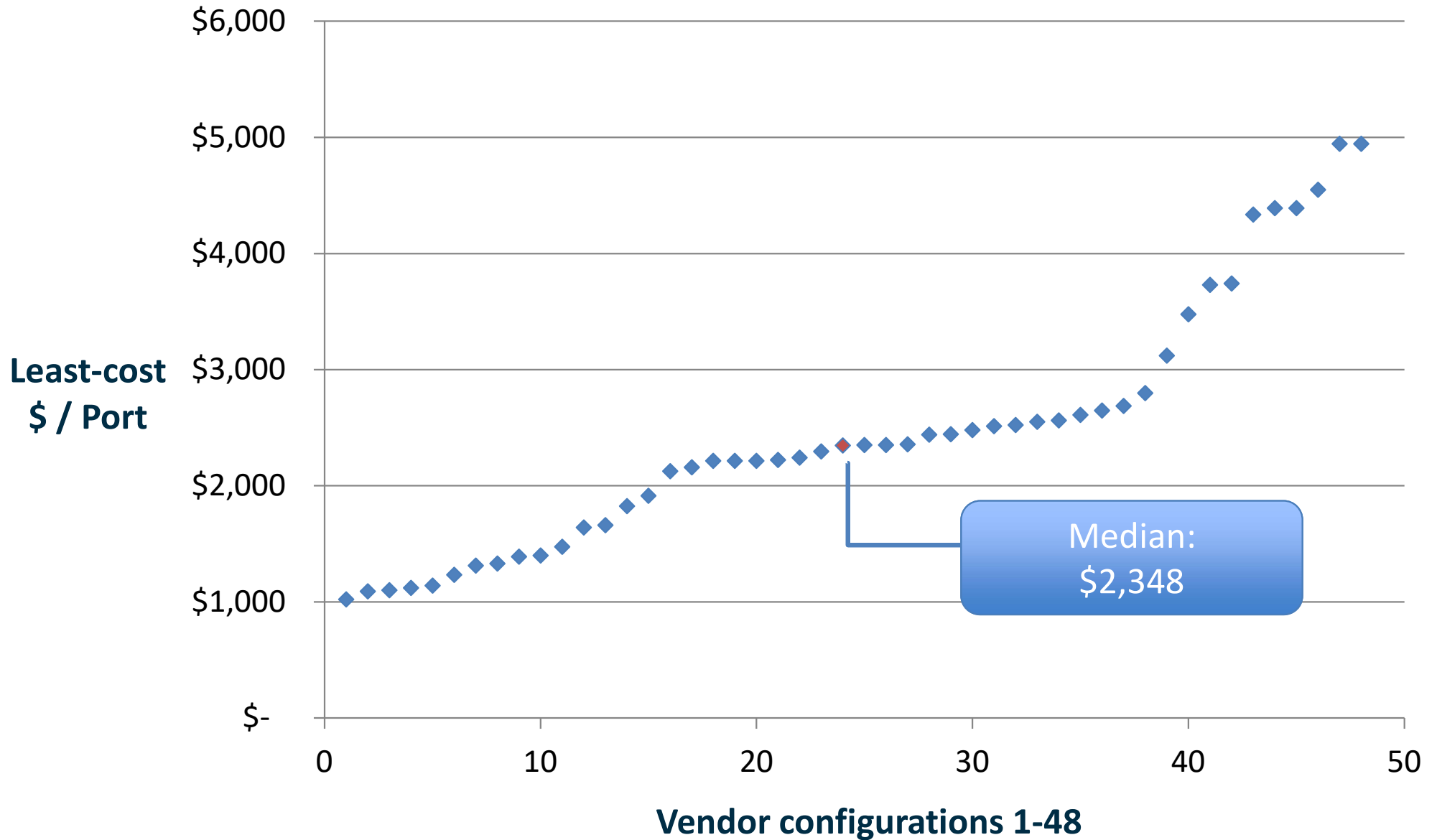
## **Outliers present, but prices cluster around \$23K**

- Prices for 10 ports ranged widely, relying on median for average



# Median price of lowest cost units is \$2,348

## EVSE Hardware Prices







# PG&E's proposed base cost method

Proposed Base Cost: \$2,300 per port

- The proposed base cost is based on the median of the lowest cost configurations from all qualified vendors
- Proposed base cost is more representative of the vast EVSE market and provides customers with greater access to a variety of models
- Rebate amount is not to exceed 100% of the selected EVSE cost (if, for example, a site host selects a less expensive EVSE)
- PG&E will perform an annual review of new EVSE models qualified through the RFQ and adjust the base cost if a new model would result in a material change of 25%



## Alternative proposal from TURN

- TURN agreed with PG&E's recommended base cost for multiunit dwellings
- TURN submitted alternative methods for determining the base cost for workplaces:
  - The lowest-cost model of all qualified EVSE models
  - The average of all least-cost models for the first two quartiles of qualified stations
  - The average of the lowest-cost and median least-cost configurations of all qualified stations



# Rebates and participation payments with PG&E's proposed base cost method

## Capping Rebates at EVSE Cost up to \$2,300 per Port or Associated % of Rebate

- Rebates will be capped at the lesser of EVSE hardware cost or rebate amount

### Participation payment/rebate structure:

Site Location	Qualification	EV Charge Owner Rebate	EV Charge Sponsor Participation Payment
MUD	Disadvantaged Community	Project cost up to \$2,300	Selected charger cost less \$2,300
MUD	<b>Not</b> in a Disadvantaged Community	50% of \$2,300 (\$1,150)	\$1,150 plus difference of selected and \$2,300
Workplace	Disadvantaged Community	50% of \$2,300 (\$1,150)	\$1,150 plus difference of selected and \$2,300
Workplace	<b>Not</b> in a Disadvantaged Community	25% of \$2,300 (\$575)	Not applicable in non-DAC workplace



# Sample Rebate and Participation Payments – Charge Owner vs Charge Sponsor Models

## Example A: EV Charge Owner

(Site host-owned EV Charger in MUD not in Disadvantaged Community)

### A) 50 % of base charger cost

Base charger cost	\$2,300
	x 50%
Rebate amount:	<b>= \$1,150</b>

### B) Selected charger cost

Selected charger cost	<b>\$3,000</b>
-----------------------	----------------

### Total site host costs: B - A

Selected charger cost	\$3,000
Rebate amount	- \$1,150
(per charger)	<b>= \$1,850</b>

Number of chargers	x 10
--------------------	------

<b>Net site host cost*</b>	<b>= \$18,500</b>
----------------------------	-------------------

## Example B: EV Charge Sponsor

(PG&E-owned EV Charger in MUD not in Disadvantaged Community)

### A) 50 % of base charger cost

Base charger cost	\$2,300
	x 50%
	<b>= \$1,150</b>

### B) Diff. between selected and base charger

Selected charger cost	\$3,000
Base charger cost	- \$2,300
	<b>= \$700</b>

### Total site host charger costs: Sum of A + B

Participation payment	\$1,150
	+ \$700
(per charger)	<b>= \$1,850</b>

Number of chargers	x 10
--------------------	------

<b>Net site host cost *</b>	<b>= \$18,500</b>
-----------------------------	-------------------

\*Net site host cost does not include installation costs



# Sample rebate MUD not in DAC at \$2,300 vs. \$1,000 base charger cost methodology

## Example A: \$2,300 (proposed)

(Site host-owned EV Charger in MUD not in Disadvantaged Community)

### A) 50 % of base charger cost

Base charger cost	\$2,300
	x 50%
Rebate amount:	<b>= \$1,150</b>

### B) Selected charger cost

Selected charger cost	<b>\$3,000</b>
-----------------------	----------------

### Total site host costs: B - A

Selected charger cost	\$3,000
Rebate amount	- \$1,150
(per charger)	<b>= \$1,850</b>

Number of chargers	x 10
--------------------	------

<b>Net site host cost*</b>	<b>= \$18,500</b>
----------------------------	-------------------

## Example B: \$1,000 (least cost EVSE)

(Site host-owned EV Charger in MUD not in Disadvantaged Community)

### A) 50 % of base charger cost

Base charger cost	\$1,000
	x 50%
Rebate amount:	<b>= \$500</b>

### B) Selected charger cost

Selected charger cost	<b>\$3,000</b>
-----------------------	----------------

### Total site host costs: B - A

Selected charger cost	\$3,000
Rebate amount	- \$500
(per charger)	<b>= \$2,500</b>

Number of chargers	x 10
--------------------	------

<b>Net site host cost*</b>	<b>= \$25,000</b>
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\*Net site host cost does not include installation costs



# Sample rebate MUD in DAC at \$2,300 vs. \$1,000 base charger cost methodology

## Example A: \$2,300 (proposed)

(Site host-owned EV Charger in MUD in Disadvantaged Community)

### A) 100 % of base charger cost

Base charger cost	\$2,300
	x 100%
Rebate amount:	<b>= \$2,300</b>

### B) Selected charger cost

Selected charger cost	<b>\$3,000</b>
-----------------------	----------------

### Total site host costs: B - A

Selected charger cost	\$3,000
Rebate amount (per charger)	- \$2,300
	<b>= \$700</b>
Number of chargers	x 10
<b>Net site host cost*</b>	<b>= \$7,000</b>

## Example B: \$1,000 (least cost ESVE)

(Site host-owned EV Charger in MUD in Disadvantaged Community)

### A) 100 % of base charger cost

Base charger cost	\$1,000
	x 100%
Rebate amount:	<b>= \$1,000</b>

### B) Selected charger cost

Selected charger cost	<b>\$3,000</b>
-----------------------	----------------

### Total site host costs: B - A

Selected charger cost	\$3,000
Rebate amount (per charger)	- \$1,000
	<b>= \$2,000</b>
Number of chargers	x 10
<b>Net site host cost*</b>	<b>= \$20,000</b>

\*Net site host cost does not include installation costs

# Appendix



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