



Strategies for Meeting Future EV Charging Demand

EV Charging Workshop
Javits Center, New York, NY
April 2, 2015





Pacific Gas and Electric Company



Energy services for over 15 MM people:

- 5.2 MM Electric customer accounts
- 4.4 MM Natural Gas accounts

70,000 square miles with diverse topography, climates and customers

20,000 employees

A regulated investor-owned utility

Independent Transmission System Operator

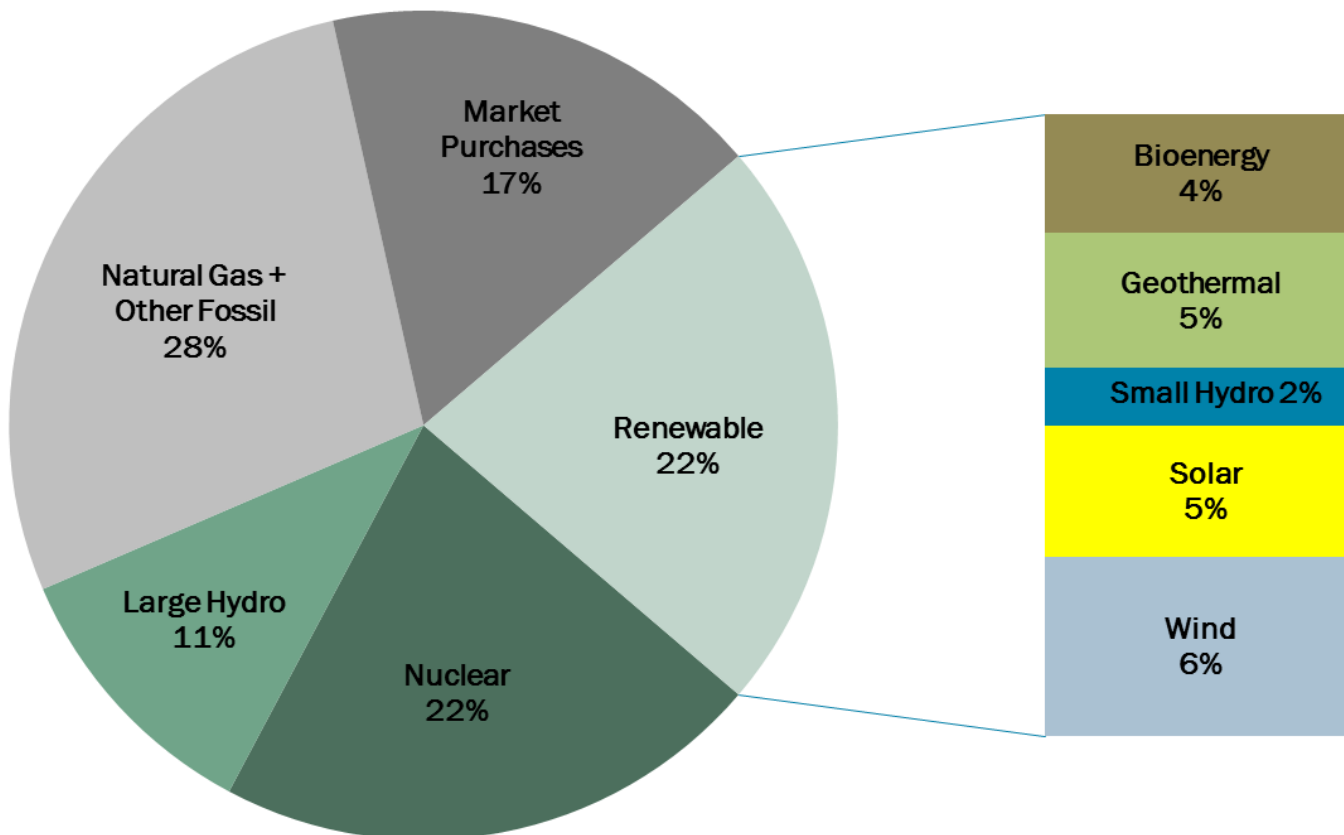
Ranked "Greenest" utility 2009 and 2010





PG&E's 2013 Electricity Mix

Figures represent % of PG&E's total bundled retail sales

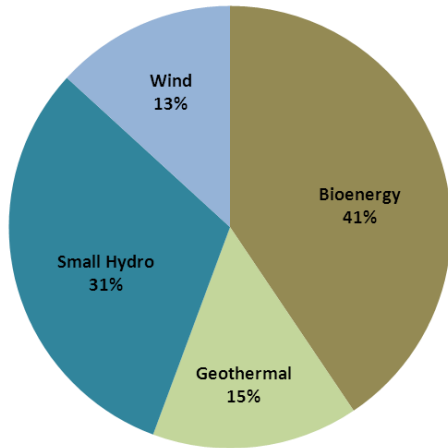




Resource Integration: Past, Present, Future

2002 Actual

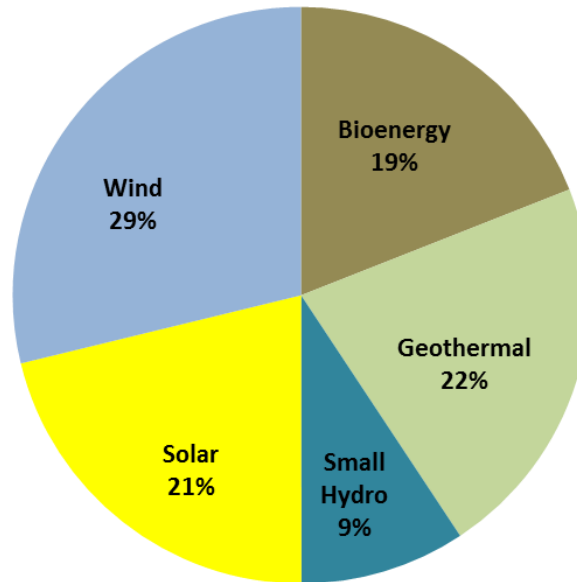
11% of total bundled retail sales



Total RPS-Eligible Procurement
7,504 GWh

2013 Preliminary

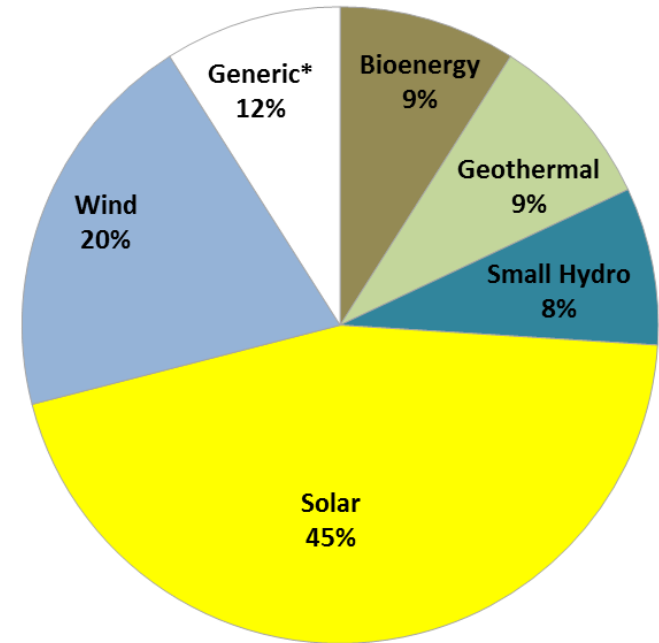
22% of total bundled retail sales



Total RPS-Eligible Procurement
17,030 GWh

2020 Projected

33% of total bundled retail sales

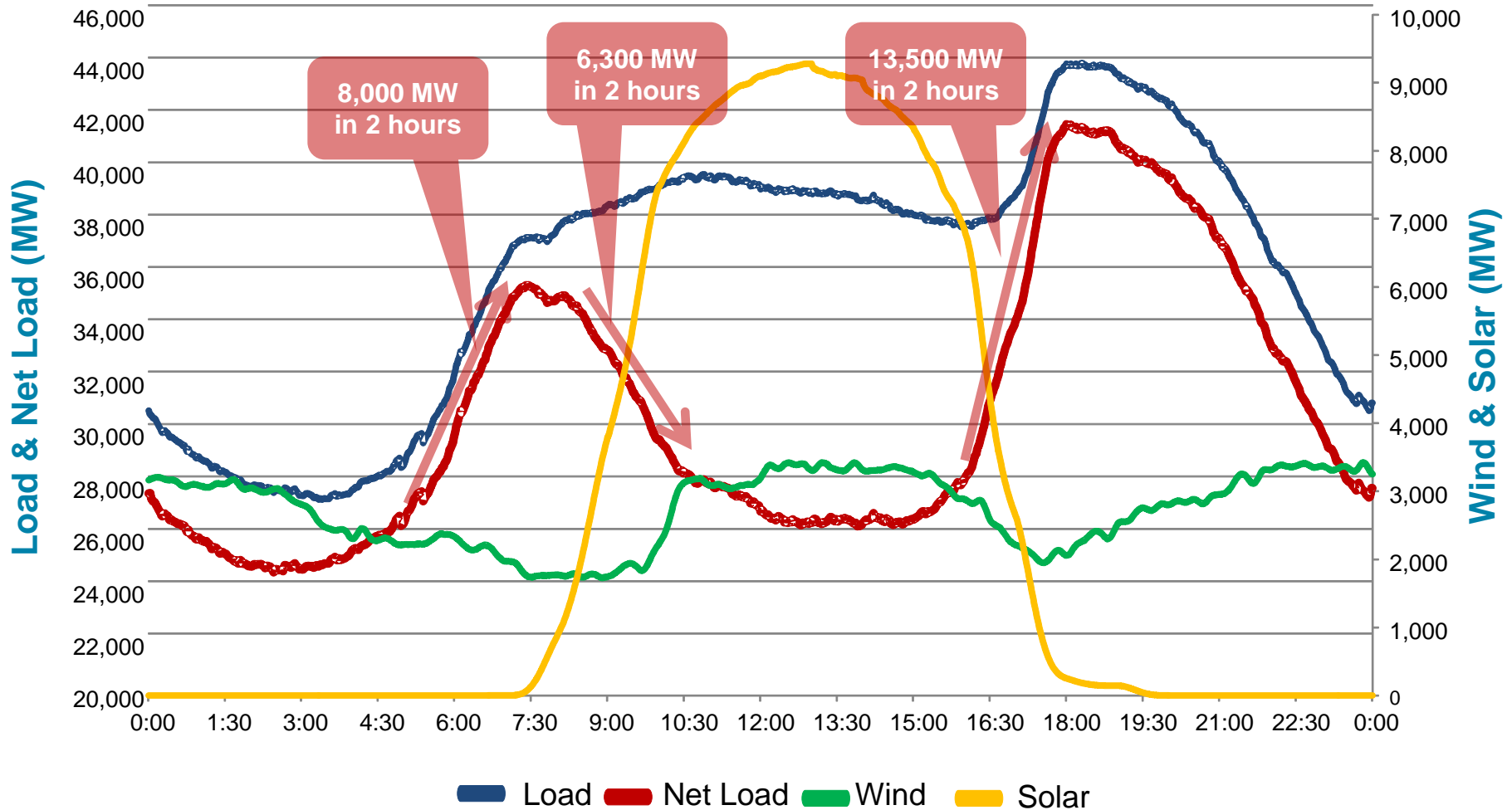


Projected RPS-Eligible Procurement
~26,500 GWh



Looking Ahead: Flexible Resources Are Important

Load, Wind & Solar Profiles – High Load Case January 2020





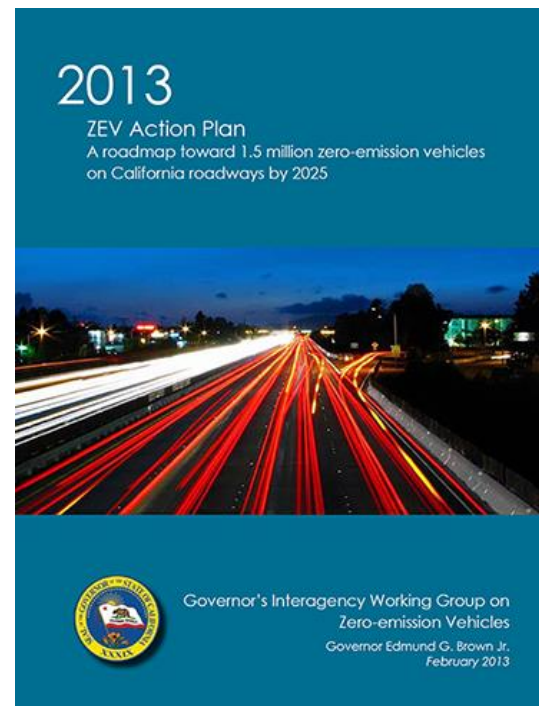
Electric vehicle market is gaining momentum, and California is focused on accelerating adoption

Electric Vehicle (EV) Market Conditions

- EV offerings are growing significantly each year (20+ models on the market today; 30+ planned for 2016)
- Sales growth limited by high vehicle cost and range anxiety
- EV adoption is outpacing infrastructure deployments

State Focus on EV Adoption

- January 2013: Governor Jerry Brown issued the Zero Emission Vehicle (ZEV) Action Plan calling for 1.5 million ZEVs in California by 2025, and the infrastructure to support 1 million EVs by 2020
- December 2014: California Public Utilities Commission (CPUC) repealed 2011 prohibition on investor-owned utility (IOU) involvement in EV infrastructure market
- January 2015: Governor Brown's inaugural address proposed to reduce petroleum use in cars and trucks by up to 50 percent by 2030

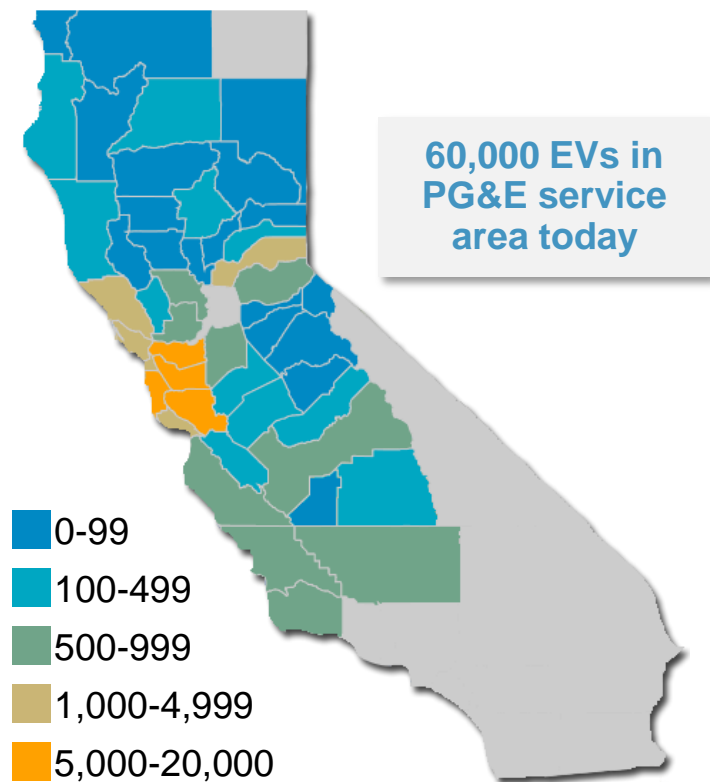




PG&E and California are seeing strong EV market growth, but infrastructure barriers to adoption still exist

Cumulative EV Sales by County¹

PG&E Service Area



PG&E's service area is adding **2,200** new EVs per month. Adoption has been strongest around the Bay Area.

0.7% of 2014 new vehicle sales in USA were electric vehicles

3.2% of 2014 new vehicle sales in CA were electric vehicles

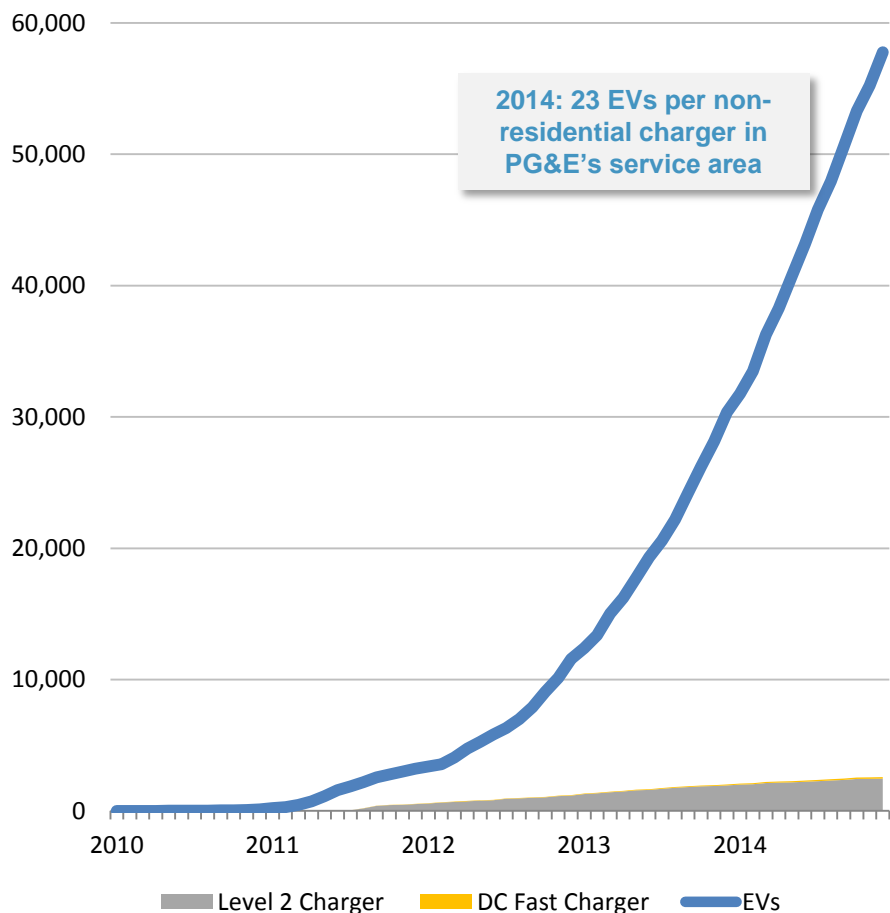
4.5% of 2014 new vehicle sales in PG&E were electric vehicles

10% of 2014 new vehicle sales in Santa Clara County were electric vehicles



Public charging infrastructure is not keeping pace with EV adoption in California

Cumulative EV registrations¹ and charger deployments² in PG&E service area



Key EV challenges today

- Higher upfront cost of EVs relative to conventional vehicle
- Range anxiety and lack of available charging infrastructure
- Charging availability for customers in multi-unit dwellings and workplaces
- Lack of easily-accessible customer information about EVs
- High infrastructure upgrade costs for commercial and fleet customers

Utility can play key role in addressing

1. EPRI, R.L. Polk Data, Dec. 2014

2. PlugShare® data, 2014



PG&E EV Infrastructure and Education Program Guiding Principles



Support California climate policy



Enable customer EV adoption



Make electricity widely available as a transportation fuel



Utilize EV load for system benefit



PG&E program designed to accelerate EV adoption through charging infrastructure and education

Proposal Overview

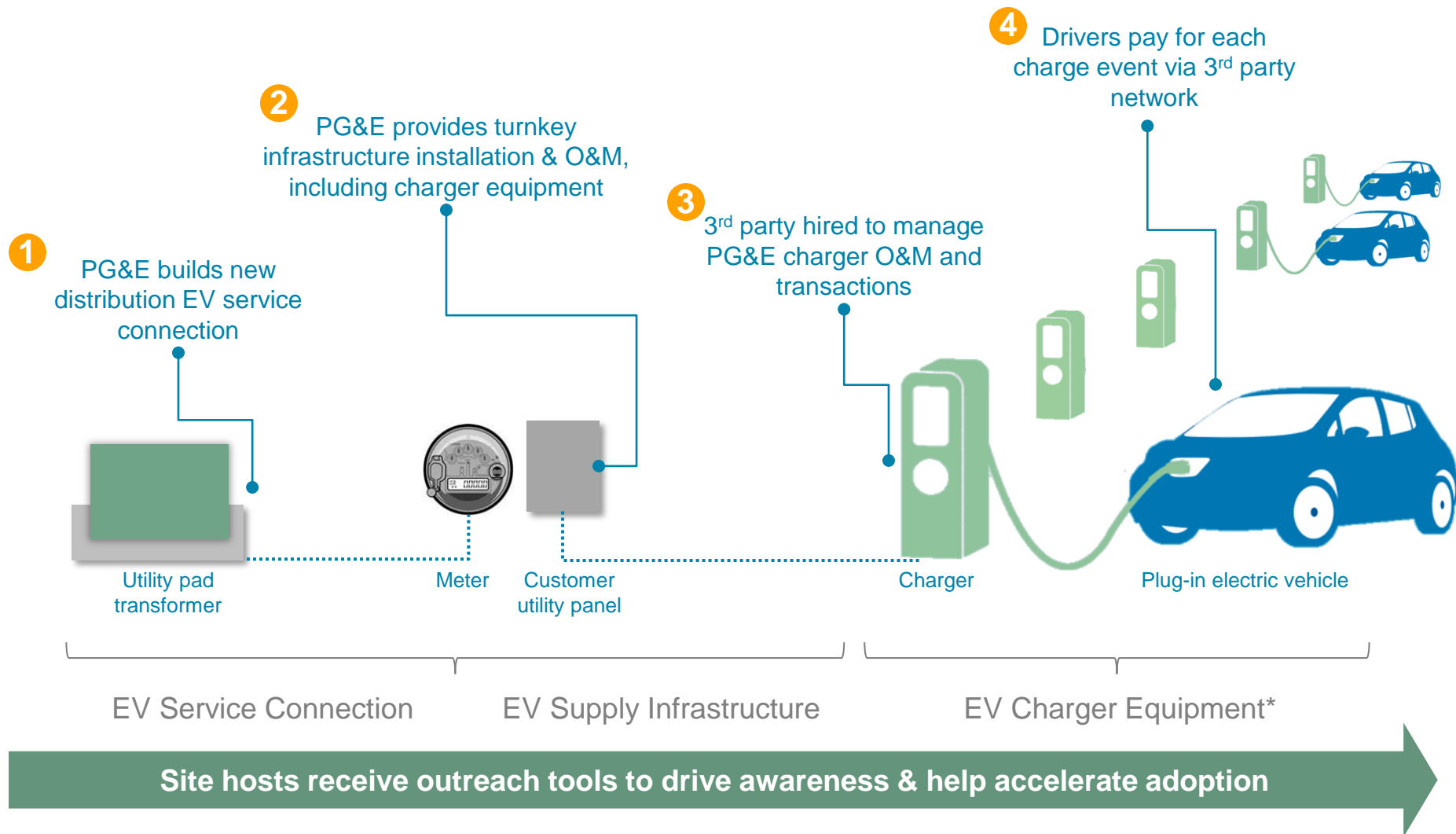
- Deploy 25,000 Level 2 chargers and 100 DC fast chargers
- 5 year program to build, own, and maintain 25% of the 2020 EV charging infrastructure need
- Deliver turnkey charging solutions with integrated education to accelerate EV adoption
- Target commercial and public locations, with approx. 10% of installations in disadvantaged communities
- Offer approved PG&E time-of-use rate to EV drivers

Operational details

- No out of pocket cost to site host – requires in-kind land easement contribution
- 3rd parties service providers contracted for charger installation, O&M, & billing
- Site hosts receive outreach tools to drive awareness & help accelerate adoption
- EV charging platform enables future smart charging to support renewables integration and drive grid benefits



PG&E's turnkey program integrates EV education with charging infrastructure for participants

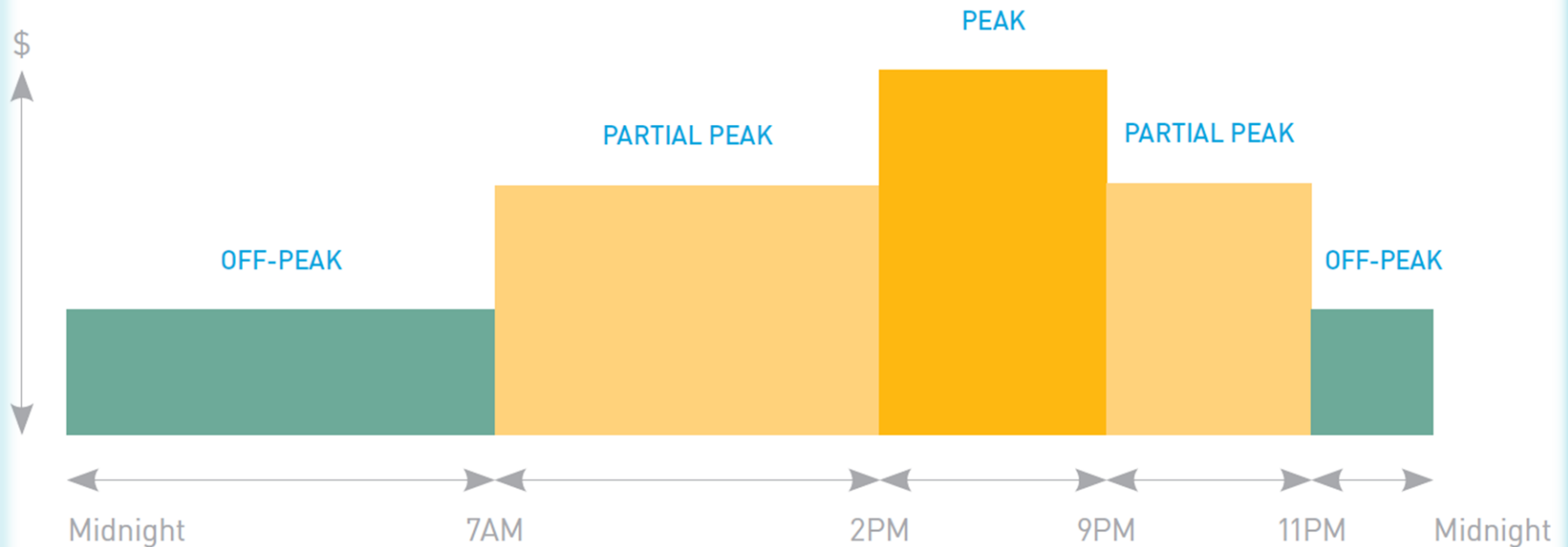


*PG&E's EV Program platform enables future smart charging to support renewables integration and drive grid benefits



Redesigned EV Rates Help Customers Lower Fuel Costs

Simplified time-of-use rates allow EV customers to charge off-peak at the equivalent of \$1/gallon, providing a benefit to customers and the utility



Thank you!

