



Electric Vehicle Supply Equipment (EVSE) Technology Review

April 28, 2022

Today's Presentation

- Background and context for EVSE Standards Regulation
- Technology Review of payment access and barriers to charging
- Next steps

California's ZEV Market

TODAY



1,054,095
EV Sales*



79,023
EV Chargers



54
H2 Stations

2030

5.7 Million
ZEV+PHEVs

714,000
EV Chargers

200+
H2 Stations

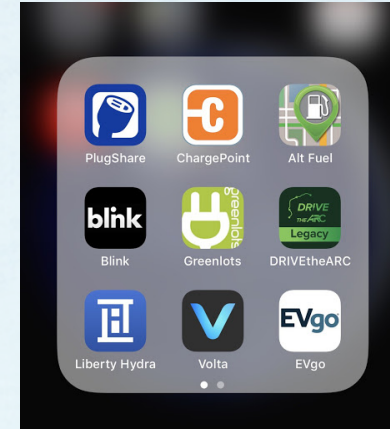
Key Milestones for the Regulation

- Legislature passed SB 454 (Corbett) in 2013
 - No membership required
 - Seamless transition to new fuel
- CARB adopted EVSE Standards Regulation in 2019
- EVSE Standards Regulation Effective July 1, 2020



EVSE Standards Regulation

- Consistent reporting
- Display of fees
- Credit card reader: mobile payment and EMV chip readers
 - New DCFC Jan 1, 2022
 - New Level 2 July 1, 2023
 - All existing stations July 1, 2033



Technology Review of EVSE Payment Access

Technology Review Topics Addressed

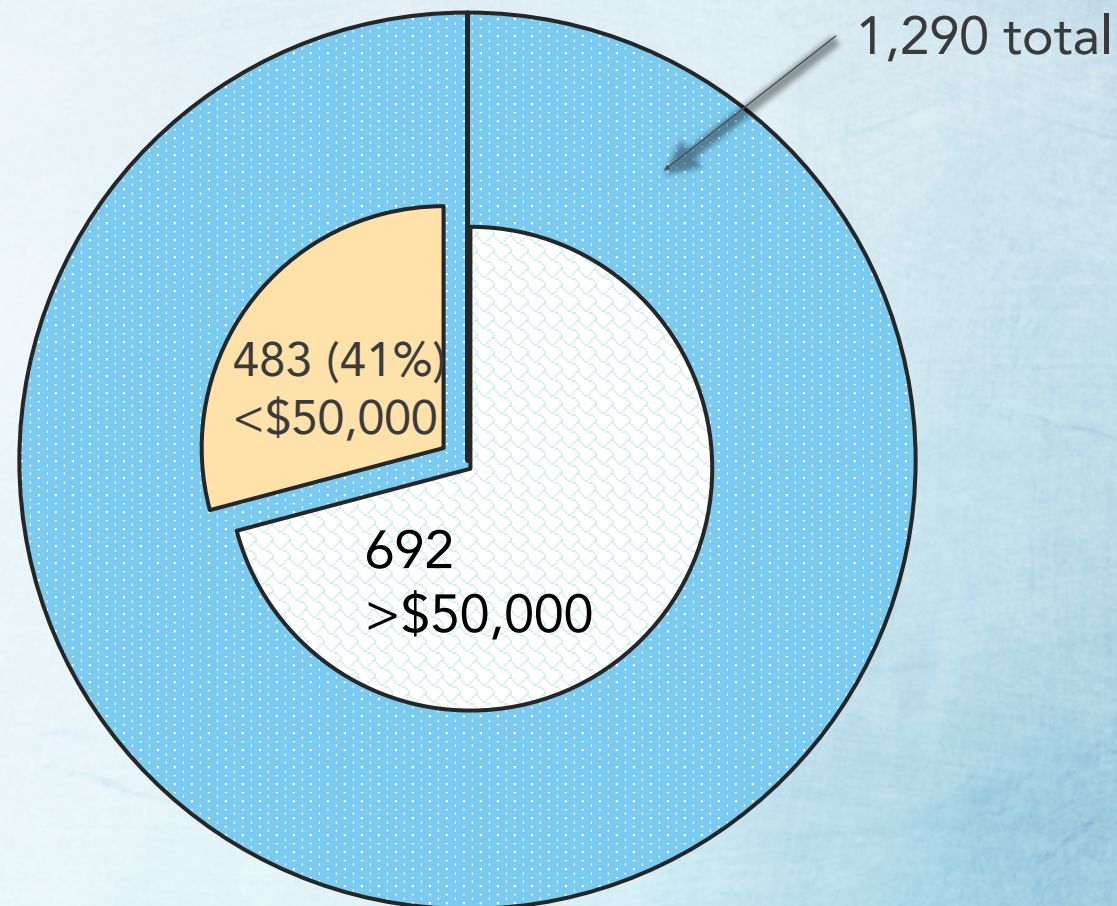
- What barriers do drivers experience when using charging stations?
- What prompts their calls to customer service?
- To what extent do drivers experience inoperable charging stations?
- To what extent are chip and contactless cards available and used by drivers?
- What payment methods are in use on charging stations?

Technology Review Development

- Ongoing stakeholder engagement
 - Public Webinar in October 2020
 - Numerous informal meetings
- Literature and data review
 - FDIC and financial industry reports about banking
 - U.S. DOE (AFDC) and other EVSE data trends
- Surveyed Electric Vehicle Service Providers (EVSP), credit card companies, and drivers

Driver Survey

- Barriers they experience with charging in public
- What payment methods they have access to (phone, tap cards, EMV chip)
- EVSP membership questions
- Interactions with customer service
- Sociodemographic



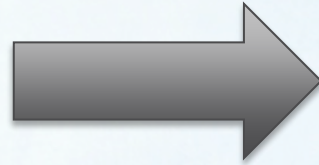
Survey Respondents by Annual Household Income

Technology Review Findings

1. Inoperable stations and payment issues are barriers
2. Membership requirements are at least a perceived barrier
3. Multiple payment methods exist, but most EVSPs rely on tap
4. Tap cards deployment remains low but is accelerating
5. Tap can expand payment options for under and unbanked drivers, but barriers remain

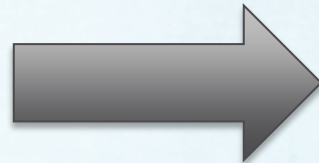
1) Inoperable stations and payment issues are barriers to drivers

What are the
"Barriers to using
public infrastructure"



- 32% membership requirements
- 24% charging station operability issues

"Reasons for
contacting customer
service"



- 70% of responses (top 3) related to inoperable stations
- 20% indicated payment challenges

2) Membership requirements may be a perceived barrier to drivers

“What was the primary reason for creating a charging network membership?”

- 76% of drivers said they had a membership
 - 67% of these said they needed one to access the station
- 62% of drivers indicated they have 2-5 memberships

3) Multiple payment methods exist, but most EVSPs rely on tap



4) Tap cards are a small segment of cards today. Deployment is accelerating.

- Visa indicates tap is 15% of their national market share
- Mastercard estimates 25% within two years nationally
- Survey revealed 52% don't use their tap feature



4) Lower-income survey respondents are somewhat less likely to have tap

- 79% of PEV drivers above \$50,000 report having tap cards
- 57% of PEV drivers below \$50,000 report having tap cards
- CARB lacks detailed data on the broader distribution of these cards among Californians generally



5) Tap has the potential to expand payment options for under and unbanked drivers, but barriers remain

- Minimum balance requirements keep households unbanked
- P2P mobile apps give access to better banking options
- Smartphone without tap payment is a barrier to public charging



Survey Response:

"29% of drivers with annual income below \$50,000 did not have a smartphone with tap payment."

Next Steps

- Track metrics for availability and use of contactless technologies
- Develop metrics and a process for tracking station up/downtime with CEC
- Deepen understanding of low-income drivers' needs
- Strengthen transparency on implementation of the regulation

The need to move away from old infrastructure...

