EV Charging Tech Toolbox: Bring-Your-Own Cord EV Charging

Presented by:

CalETC

California Electric Transportation Coalition

CALIFORNIA ENERGY CODES & STANDARDS

A STATEWIDE UTILITY PROGRAM

This program is funded by California utility customers and administered by Pacific Gas and Electric Company, San Diego Gas & Electric Company (SDG&E®), and Southern California Edison Company under the auspices of the California Public Utilities Commission and in support of the California Energy Commission.

WELCOME

- Who is in the room today?
  - Zoom Survey
- **Questions may be submitted through Zoom at any time during the session, but they will be saved until the Open Q&A.**
  - We may not be able to answer every question live, but there will also be opportunity for offline follow-up.
- To submit questions, use the "Q&A" button in Zoom.

SURVEY

Which of these categories best describes your role in the EV charging ecosystem?

- Agency / Government
- Charging provider (manufacturer or service provider)
- Building owner / operator
- EV charging advocate
- Utility
- EV Owner (including fleet owners)
- Other

AGENDA AND EXPECTATIONS

[9:00 – 9:10] Introduction from CalETC

[9:10 – 9:15] Panelist Introductions

[9:15 – 9:40] Moderated Panel Discussion

[9:40 – 10:25] Open Q&A

[10:25 – 10:30] Wrap-Up | Survey | What's Next

[10:30 – 11:00] *Optional: BONUS Technical Q&A*

Reminder: This event is primarily an interactive dialogue with our panelists.
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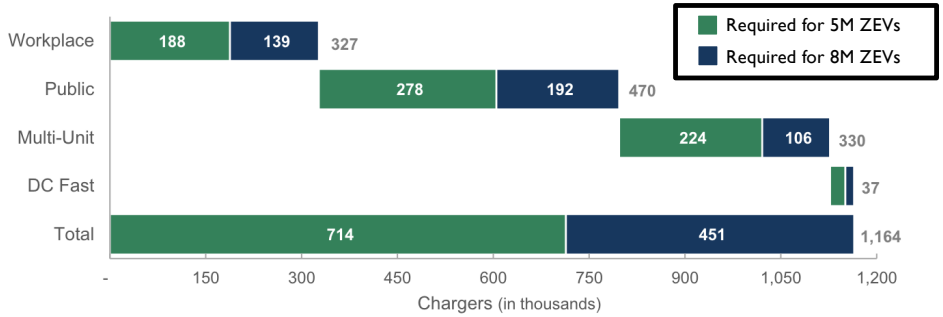
VISION / MOTIVATION FOR THIS SERIES

- Sufficient EV charging is a major barrier to EV adoption
- Millions of chargers will be needed by 2030 in CA alone
- Many stakeholders are working on parts of this problem, but rarely do we all gather in one place to discuss the issues

Figure 5: Projected 2030 Charger Counts to Support 5 Million and 8 Million Light-Duty Zero-Emission Vehicles from the First AB 2127 Assessment



Our ultimate goal is to drive conversation around the next generation of EV-related code language!

Example: Changing the CALGreen code to *explicitly* allow for the Universal EV Socket Outlet to qualify as a full L2 EVSE.

CRASH COURSE: BRING-YOUR-OWN-CORD CHARGING

BRING-YOUR-OWN-CORD CHARGING

Example of BYOC EV Charger

Example of a receptacle

"Bring-Your-Own" Cord
for use with BYOC EVSE

vs.

Today's Portable EVSE
"Convenience Cord"
(Used w/ receptacles)

Say goodbye to
(potentially unreliable or
unsafe) adapters!

BYOC CHARGING VS. OTHER CHARGING SOLUTIONS

Example of cord vandalism in Fresno, CA
(88 of 88 public chargers vandalized, $245k spent in remediation)[1]

Example of a NEMA Receptacle experiencing "thermal issues"

Customer-owned cords can be the perfect length (and color) for their vehicle!

[1] https://www.youtube.com/watch?v=F2iQaRI6wQo (CBS KSEE24 Report)

PANELISTS

Robert Cox
Professor & Executive Director, Energy Production & Infrastructure Center

UNC Charlotte

Shannon Dulaney
Director of Public Affairs

itselectric

Daniel Engelman
VP of Reliability

ChargerHelp!

Rodney McGee
Research Professor, Center for Transportation Electrification

University of Delaware & SAE

PANELIST BIO – ROBERT COX

Professor Robert Cox is the Executive Director of the Energy Production & Infrastructure Center (EPIC) at UNC Charlotte and faculty in Department of Electrical and Computer Engineering.

EPIC is an additive research center focused on energy utilization and grid modernization. He specifically focuses on advancing EPIC's research in the areas of grid resiliency and energy utilization.

Dr. Cox has been leading efforts in managed EV charging with partners from Duke Energy. EPIC's work is funded by many government and private partners including the Department of Energy, the National Science Foundation, and several major corporations and small businesses. He is a graduate of the Massachusetts Institute of Technology.

PANELIST BIO – SHANNON DULANEY

Shannon Dulaney is an urbanist with a decade-long commitment to advancing sustainable transportation. As Director of Public Affairs for itselectric, she oversees the company's government relations and public policy activities, and secures municipal permits and government funding to support itselectric's growth.

Prior to joining itselectric, she led the North American Community Partnerships team at Spin, a shared micromobility company, and worked as a federal policy analyst and lobbyist for Honda. Shannon holds an MBA and a Master of Environmental Management from the Yale School of Management and the Yale School of the Environment, and a bachelor's degree in political science from the University of California, San Diego. She lives in Fort Greene, Brooklyn with her family.

PANELIST BIO – DANIEL ENGELMAN

ChargerHelp is fixing the single, greatest barrier to faster electric vehicle adoption: the charging experience. As the first company exclusively dedicated to EVSE operations and maintenance, we're working together with the entire EVSE value chain to make true uptime the norm — so the overall EV market can flourish. We achieve that goal through three pillars: offering turnkey EVSE O&M through Reliability as a Service (RaaS), empowering EVSE owners and operators, as well as EVSE O&M providers, through the EMPWR software platform, and providing learning and development programming to foster a skilled EVSE technician workforce.

As VP of Reliability, Daniel Engelman oversees the service delivery of ChargerHelp!'s Reliability as a Service (RaaS) product. He holds a bachelor's degree in Electrical Engineering and almost two decades of demonstrated success leading complex programs maintaining and operating publicly deployed IOT assets. As VP of Link at Intersection Daniel led the program development, deployment, and operation of LinkNYC, the world's largest public WiFi and digital out-of-home advertising network.

PANELIST BIO – RODNEY MCGEE

Dr. Rodney McGee is a research professor at the Transport Electrification Center at the University of Delaware. In this role, McGee leads a team of engineers in designing, testing, and productizing advanced bidirectional (V2X) EVSE and EV systems while working closely with OEMs and suppliers to foster cutting-edge technology development.

In addition to his work at the University of Delaware, McGee chairs SAE's Medium- and Heavy-Duty Conductive Power Transfer Task Force (SAE J3068) and the NACS (SAE J3400) Task Force. Through these leadership roles, he actively contributes to advancing industry standards in the electric vehicle sector.

MODERATED PANEL DISCUSSION

Q1: What is the difference between a receptacle and the EV socket outlet?

Receptacle (NEMA 14-50)

EV Socket Outlet

Q2: What needs to happen before BYOC charging options are ubiquitous in the United States?

Q3: What are typical challenges with providing power to curbside EVSEs?

Q4: Is there a cost difference between corded EVSEs and BYOC EVSEs?

Does this differential come mainly from first cost or maintenance cost?

Q5: What is the one message you would like to send to the public regarding BYOC charging?

OPEN Q&A

Reminders:

We may not be able to answer every question live, but there will be opportunity for offline follow-up.

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WHAT COMES NEXT?

- Future event topics
  - Balancing customer charging session costs with site host needs for cost recovery
  - Parking lots that are grid-interactive and ready-to-export
  - **Contact us with ideas at evtechtoolboxideas@gmail.com**

- Materials from this event will be emailed to all participants and posted to Tech Toolbox Website
  - **Website Link:** https://caletc.com/advocacy/ev-tech-toolbox/
  - **Link to join Tech Toolbox distribution:** https://forms.gle/ZVHTSEUxEQLSNWeBA

- Survey… coming right up!

SURVEY

- How would you rate the usefulness of this event [0-5]?
- What topics should we consider for the next Tech Toolbox session?
- Any other feedback on how we can improve the event?

BRING-YOUR-OWN-CORD CHARGING PROS AND CONS

High-level benefits of BYOC Charging

- Guaranteed Compatibility
- Reduced risk of vandalism/damage
- Compact form factor, good for curbside
- ALMS friendly and V2G ready
- Single-phase and 3-phase compatible
- Improved safety vs. corded EVSE or receptacle

Downsides vs receptacle

- BYOC is more expensive than receptacles for site hosts

Downsides vs corded EVSE

- BYOC customers need to remember to bring their cord in order to charge
- BYOC customers (may) have to pay for a cord (if not provided by vehicle OEM)

Thank You For Attending!

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https://caletc.com/

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https://title24stakeholders.com/about-us/

BONUS TECHNICAL Q&A

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Link to useful pictures

REFERENCES

1. 2024-02 Community Charging - Emerging Multifamily, Curbside, and Multimodal Practices - Joint Office of E&T
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4. 2024-08 SFMTA Curbside Charging Presentation
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