Welcome!

CPUC En Banc on Transportation Electrification in California Investor-Owned Utility Territory

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<td>Introductory Remarks</td>
<td>Commissioner Rechtschaffen</td>
<td>5 min</td>
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<td>State TE Goals, Progress, and Gaps</td>
<td>Energy Division, CPUC</td>
<td>25 min</td>
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<td>Statewide TE Infrastructure Deployment and Vision</td>
<td>Hannon Rasool, Deputy Director of Fuels and Transportation Division, CEC</td>
<td>30 min</td>
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<td>Commissioner Discussion on Optimizing Ratepayer Funding</td>
<td>CPUC Commissioners</td>
<td>1 hour 15 min</td>
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<td>Public Comment Period</td>
<td>3 minutes per commenter</td>
<td>15-30 min</td>
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To sign up for public comment, email Nicole.Cropper [at] cpuc.ca.gov
Transportation Electrification in California Investor-Owned Utility Territory: Goals, Progress, and Gaps

Presented by CPUC Energy Division Staff
Transportation Electrification En Banc | October 13, 2021
California climate and EV targets require rapid buildout of charging infrastructure

- GHG Emissions relative to 1990
  - Equal
  - 40% below
  - Net zero

Electricity Grid
- Zero-carbon retail electricity sales
  - 33%
  - 50%
  - 60%
  - 100%

Charging infrastructure
- Ready for 1M EVs
- 250k 10k DCFC

Transportation System
- Light-duty
  - 1M
  - 1.5M
  - 5M
  - 100% new sales
- Medium- and heavy-duty
- Freight vehicles and equipment
- Off-road vehicles and equipment

Source: CEC
California has nearly 1 million EVs on the road

- **924,822** CA EV Sales
- **2,084,118** U.S. EV Sales
- **70** CA Models Available
- **74,459** CA EV Chargers
- **52** CA Hydrogen Stations

Q2 2021 Data Update. Posted Aug 5, 2021
EV Adoption is not equal among Californians

- Currently, EV adoption is higher among higher income drivers
- California must ensure that TE benefits are received by all
However, battery prices are falling fast – EV retail prices could reach cost parity with gas cars in 2023, leading to more rapid and equitable adoption.
CEC estimates need for 1.2 million public/shared chargers by 2030 to support light-duty EVs

**Forecasted CA Charger Need = 1,164,000**

**Current Installed CA Chargers = 74,456**

- Green = 5M EVs
- Blue = 8M EVs

Source: Assembly Bill (AB) 2127 Electric Vehicle Charging Infrastructure Assessment (California Energy Commission, 2021)

CEC estimates need for 157,000 chargers to support medium- and heavy-duty EVs in 2030

- To support CARB’s estimate of 180,000 battery-electric MDHD vehicles by 2030, the CEC estimates need for:
  - 141,000 50 kW chargers
  - 16,000 350 kW DC fast chargers

- CPUC has authorized $729 million in funding to support 11,500 MDHD vehicles (<10% of CARB estimate)

- In addition, for TNCs (e.g., Uber and Lyft), CEC estimates a need for 2,000 DCFC in Greater LA, SF, and San Diego
Collaborative problem solving is critical

• Local and Regional Government
  • Air Districts
  • City/County Government
  • Metropolitan Planning Organizations
  • Regional Transportation Planning Agencies

• Federal and Tribal Governments
  • Federal Government Agencies and National Labs
  • Tribal Governments

• Vehicle Manufacturers and Supply Chain
  • Dealerships (and dealership groups; direct sales)
  • Light-Duty Manufacturers
  • Medium- and Heavy-Duty Manufacturers
  • New Market Entrants
  • Off-Road Vehicles and Equipment Manufacturers
  • Suppliers

• Grid Operators, Electricity, and Hydrogen Providers
  • Balancing Authorities
  • Community Choice Aggregators
  • Electric Utilities, Load-Serving Entities
  • Electric Vehicle Charging Station Providers and Installers
  • Gas Utilities
  • Hydrogen Producers
  • Hydrogen Station Developers and Operators
  • Registered Service Agencies

• Fleets (public and private)

• Non-Governmental Organizations
  • Codes and Standards Bodies
  • Collaboratives
  • Community-Based NGOs
  • Environmental NGOs
  • Equity NGOs
  • Trade Associations

• Investors/Financing Institutions

• Organized Labor

• Academia
  • Community Colleges
  • Universities

• International Relationships

Source: ZEV Market Development Strategy, GO-Biz, Feb 2020
CPUC and IOUs are accelerating the transition to electrified transportation

• Deploying electric vehicle charging infrastructure to meet customer demand
• Planning and building an electric grid and interconnection process that can safely and efficiently accommodate EVs
• Designing electricity rates that allow for affordable charging while facilitating grid-beneficial vehicle-to-grid integration
• Conducting program evaluation and interagency coordination to ensure ratepayer investments to support zero emission vehicles are strategically coordinated
CPUC has authorized ~$1.85 billion in TE investments

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<tr>
<th>Year</th>
<th>Program Description</th>
<th>Funding</th>
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<tr>
<td>2016</td>
<td>SCE’s Charge Ready Pilot</td>
<td>$22M</td>
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<tr>
<td></td>
<td>SDG&amp;E’s Power Your Drive</td>
<td>$45M</td>
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<tr>
<td></td>
<td>PG&amp;E’s EV Charge Network</td>
<td>$130M</td>
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<tr>
<td>2018</td>
<td>SCE’s Charge Ready Bridge</td>
<td>$22M</td>
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<tr>
<td></td>
<td>SB 350 Small IOU Programs</td>
<td>$7.6M</td>
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<td></td>
<td>SB 350 Priority Review Pilots</td>
<td>$42.8M</td>
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<td></td>
<td>SB 350 Standard Review Projects</td>
<td>$650.5M</td>
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<tr>
<td>2019</td>
<td>PG&amp;E’s EV Empower</td>
<td>$4M</td>
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<tr>
<td></td>
<td>SDG&amp;E’s Power Your Drive Fleets Program and V2G School Bus Pilot</td>
<td>$113.5M</td>
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<td></td>
<td>AB 1082/1083 Schools, Parks &amp; Beaches</td>
<td>$54.5M</td>
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<tr>
<td>2020</td>
<td>SCE’s Charge Ready 2</td>
<td>$436M</td>
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<td></td>
<td>SB 676 VGI Pilots</td>
<td>$38.7M*</td>
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<tr>
<td>2021</td>
<td>SDG&amp;E’s Power Your Drive Extension</td>
<td>$43.5M</td>
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<tr>
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<td>TEF Near-Term Priorities</td>
<td>$240M*</td>
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* Funds authorized for IOU proposals, but no programs/pilots yet approved
IOU TE Programs advance equity through DAC and multi-unit dwelling targets, and focus funding on MDHD

- Light-duty programs require multi-unit dwelling deployments, which is aimed at increasing charging access for low- and middle-income customers
- MD/HD sector programs are critical to improving air quality for DAC residents. Each of the large IOU TE programs require:
  - at least 15% of budgets to serve transit agencies
  - rebates of up to 50% of the EVSE cost for sites in DACs and sites supporting school buses and transit focus on shuttle, delivery, or transit routes that go through DACs
  - at least 25% (PG&E), 40% (SCE), and 30% (SDG&E) of the MDHD infrastructure budget committed to DACs
- AB 841 now requires CPUC programs to commit a minimum of 30% of program budgets to “underserved communities”

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<tr>
<th>Recent TE Authorizations</th>
<th>DAC / Underserved Community Targets</th>
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<tr>
<td>SCE Charge Ready 2</td>
<td>50% of ports (15% in MUDs)</td>
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<tr>
<td>SDG&amp;E Power Your Drive 2</td>
<td>50% of funds</td>
</tr>
<tr>
<td>Near-Term Priorities PD</td>
<td>50% of funds</td>
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CPUC also helps vehicle ownership become more affordable through EV charging rate design.

For drivers charging off-peak, charging an EV is on average ~1/3 the cost of fueling a gasoline-powered car.

https://theicct.org/publications/EV-equity-feb2021
Questions?
California Energy Commission
Hannon Rasool, Deputy Director of the Fuels and Transportation Division
Policy Priorities for Optimizing TE Infrastructure Buildout

Presented by CPUC Energy Division Staff
Transportation Electrification En Banc | October 13, 2021
Are the IOUs and ratepayers responsible for further TE market acceleration?

Yes…
• SB 350 (De León, 2015) requires CPUC to approve programs that “accelerate widespread transportation electrification”, if they’re consistent with requirements
• AB 841 (Ting, 2020) authorizes distribution-side upgrades without the need for a specific application

But to what extent?
• We must “accelerate” progress, but the extent of acceleration is not defined
• How do you define and demonstrate “market acceleration”? How do you demonstrate market acceleration?

And what responsibility do other state agencies have for market acceleration?
• CEC and CARB have market acceleration directives as well, often specified by Executive Order or Legislation
The role of the IOU in TE market acceleration is evolving, but policy questions remain.

- **Utility assets** (e.g.: power lines, transformer)
  - Rule 15/16 + AB 841 Electric Rules
  - To the meter (TTM) infrastructure

- **Meter**
  - Behind the meter (BTM) infrastructure or make-ready

- **Electric panel/switchgear**
  - Mix of incentives – IOUs, CEC, CARB, Air Districts, etc., plus private sector funding

- **Charger**
  - IOU LCFS, Other Agency Funds

- **Plug-in electric vehicle**

Top Diagram source: PG&E
Energy Division’s Transportation Electrification Framework (TEF) proposed a strategic approach to TE planning and procurement; however, many issues are unresolved:

- How to align and time IOU TE targets with state TE targets / modeling
- Coordinating ratepayer TE investments with other state, regional, and local government investments
- Extent of IOU ownership of charging infrastructure on the customer's property (vs customer ownership)
- Overall levels of ratepayer funding to authorize
- Mechanism from procuring charging infrastructure
  - Durable rebate programs (e.g., California Solar Initiative)?
  - RFPs or Reverse Actions?
  - One-off IOU TE applications (i.e., business as usual)?
Resolving those issues requires policy prioritization and potential tradeoffs

• Deploying chargers as rapidly as possible to meet state goals?
• Equitable distribution of and access to charging infrastructure?
• Filling gaps left by the market/private sector?
• Reducing cost of IOU distribution system infrastructure upgrades and equipment?
• Accelerating specific sectors or use cases (e.g., transit, long-distance drivers)?
• Maximizing GHG reductions / air quality benefits?
Commissioner Roundtable Discussion Topics

1. Coordinating ratepayer TE investments with other state, regional, and local government TE investments
2. Timing of Investments: From here to 2030 and beyond
3. Optimizing TE programs for critical policy objectives
4. IOU Ownership of TE Charging Infrastructure
5. Optimal mechanisms for distributing ratepayer funding
Public Comment Period
Thank you