

STEPS workshop: EV Infrastructure for Light Duty Vehicles, Freight and Transit: Utility Perspective on EV Infrastructure Requirements

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Dean Taylor

Principal Advisor

Air & Climate Policy

EVs and the Grid

- EV market increased from near zero to over 1.3 million EVs globally in five years
 - Overcame difficult “chicken-and egg” dilemma that stopped most alternative fuels with mostly home charging and build-as-you-go approach to away-from-home charging
- Based on 2008 State Alternative Fuels Plan (CEC and CARB) EVs compared to gasoline counterparts:
 - Emit approximately 70 percent fewer greenhouse gases
 - Emit over 85 percent fewer ozone-forming air pollutants and
 - Use 100 percent less petroleum.
- These reductions were based on a grid with about 15% renewables and will grow much larger when we reach 50% large renewables in 2030
 - Reductions today can be 100% in all categories with rooftop solar for EVs

The Grid Can Accommodate EV Adoption

- The electric system is huge
 - The system use of existing assets is about 40 - 45%
 - EVs can help make the grid more efficient by charging at off-peak times
 - Off-peak charging puts downward pressure on rates
- Large amounts of zero-emission power plants are being added which will dramatically change the definition of off-peak
 - Will be a very large future need for EVs to be charging in the day for most of the year to utilize solar power

SCE's Transportation Electrification (TE) Efforts

- Established programs
 - Targeted market education and outreach (ME&O)
 - Six rates designed with TE in mind
 - Strengthening our distribution system
 - Testing and evaluation / codes and standards / fleet demonstrations
 - Trade associations (RD&D, policy, tech transfer, education)
 - EV pilots
- New programs in 2016
 - Charge Ready infrastructure pilot – make ready infrastructure and station rebates
 - Charge Ready Broad market education and TE Advisory Services for business customers
 - Light duty Low Carbon Fuel Standard credits (Clean Fuel Reward in late 2016)
- Upcoming
 - New PUC policies as accelerating widespread TE in all market segments is now a primary mission of the PUC
 - New SCE proposals to accelerate both light duty, freight and transit EVs
 - Make readies
 - Broad and targeted ME&O
 - New EV rate for above 500 kW demand
 - Low Carbon Fuel Standard for away-from home charging (fleets, workplaces, public, transit, forklifts)
 - Additional TE pilots

Utility Perspective on EV Infrastructure Requirements

- SCE's new infrastructure pilot only serves workplaces, multi-unit dwellings, fleets and destination centers with long-dwell parking
 - Pilot serves about 33% of the market need
 - Accelerated adoption is required to meet state goals and SB 350
- To receive ratepayer-funded make readies for light duty EV, SCE's new pilot requires:
 - Installation of 10 charging stations (5 in disadvantaged communities)
 - Demand response capability at the station, kiosk or circuit
 - Time of use rates for EVs from a separate service drop and panel
 - Charging stations and their providers to go through a qualification process
 - Site hosts to be responsible for selecting, owning and maintaining the charging stations and paying for a portion of the station costs
- Likely future efforts
 - Encouraging technological development
 - Two to four port stations with power sharing or sequencing
 - Demand response for medium and heavy duty EVs
 - Codes and standards for higher power charging
 - Lower cost technology and solutions
 - Exploring solutions to over supply from solar power in some months
 - Improved maintenance of stations
 - More attention to customer experience and satisfaction (e.g. better than gasoline)

Potential Future Efforts for SCE

- Encouraging technological development
 - Two to four port stations with power sharing or sequencing
 - Demand response for medium and heavy duty EVs
 - Codes and standards for higher power charging
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