

Charging Ahead: Electric Vehicles & the Impact on Electricity Delivery in California

A Joint Informational Hearing of the Senate Committees on Energy, Utilities & Communications and Transportation & Housing

With great fanfare and welcome, electric vehicles are making a comeback to the showroom floors of automobile makers this fall. The successful delivery, deployment and use of these plug-in electric vehicles (PEVs) will require policy makers, planners and consumers to rethink the way we drive and fuel our cars. Although we have a significant amount of work to do in the long-run, in the short run the California Energy Commission estimates that 30,000 PEVs will hit the roads of California within the next three years. It is critical to the long-term success of PEVs that the customer experience with these vehicles is positive and the electric grid maintains its stability. The purpose of today's hearing is to explore the infrastructure investments at the customer site, commercial site, public charging site, and distribution system level that are necessary to prepare the electricity system for the widespread use and deployment of PEVs and access to charging for PEV owners.

No one entity can electrify all or any portion of the transportation sector alone. It will require a broad range of public and private partners to modify the fueling system for vehicles to the electric grid and create access to the grid for charging those cars. State agencies including the California Public Utilities Commission, California Energy Commission and the California Air Resources Board have all dedicated significant resources to the policies surrounding electric vehicles. In the private sector vehicle manufacturers, vehicle charging companies and the investor-owned public utilities have also made the successful deployment of PEVs a priority. Local publicly owned utilities are also at the forefront. Attempts to bring electric vehicles to the market were made in the 1990s but languished though there are still several hundred of those cars on California roads.

For today's hearing the committees will explore several issues including: the lessons that can be learned from the 1990s roll-out of PEVs that can be used to ensure success going forward.

- How many PEVs can we expect in California and in what regions?
- Are local governments and the utilities ready to work with customers to establish PEV charging service quickly and efficiently?
- Access to residential charging is critical yet a good portion of California residents are "garage orphans" – particularly those in urban communities. What can be done to reach into those areas to provide charging access?
- The Electric Power Research Institute has extensively studied the issue of PEVs and adopted a pyramid for prioritizing charging services – the top is public, the middle is

work, and the base of the pyramid, which is the largest section, is designated as residential resulting in an assumption that the bulk of charging access should be available at home which is consistent with balancing the electrical load on the grid. Is this priority the right one for California? Do our state policies reflect this priority access?

When managed properly, the new demands on the state's electricity distribution systems can benefit ratepayers and PEV owners alike. Electric vehicles can benefit the environment by reducing tailpipe emissions but absent strong state policy, electrification of the transportation sector could result in the construction of more conventionally-fueled power plants to meet increased peak demand loads and also result in increased power plant emissions. A well-planned PEV charging infrastructure can shift a significant amount of charging to off-peak times, thereby avoiding new capacity builds and increasing utilization of existing plants, which can reduce the costs of the electric system in the state. How are agencies and the utilities preparing to manage that load?

Related Studies, Reports & Resources

Light-Duty Vehicle Electrification in California: Potential Barriers and Opportunities
Staff White Paper, California Public Utilities Commission
<http://www.cpuc.ca.gov/NR/rdonlyres/AD8A4A5E-6ED9-4493-BDB6-326AB86A028E/0/CPUCPPDElectricVehicleWhitePaper2.pdf>

2010-2011 Investment Plan for the Alternative and Renewable Fuel and Vehicle Technology Program
California Energy Commission
July, 2010
<http://www.energy.ca.gov/2010publications/CEC-600-2010-001/CEC-600-2010-001-CTF.PDF>

Assessment of Plug-in Electric Vehicle Integration with ISO/RTO Systems
ISO/RTO Council
<http://www.isorto.org/site/apps/nlnet/content2.aspx?c=jhKQIZPBImE&b=2613997&ct=8107539¬oc=1>

Zero Emission Vehicle Program
California Air Resources Board
<http://www.arb.ca.gov/msprog/zevprog/zevprog.htm>

Plug-in America
<http://www.pluginamerica.org/index.shtml>

DriveClean: A Buying Guide for Clean and Efficient Vehicles
California Air Resources Board
<http://www.driveclean.ca.gov/>