Workshop Summary

Integrating Transportation and Electricity to Reduce Carbon Impact

July 27, 2016
Berkeley, CA

Background

New state mandates encapsulated in SB 350—increasing renewable energy generation and electrifying transportation—are each potentially significant paths to reducing greenhouse gas emissions. However, this combination may cause conflicting signals, with implementation scenarios that could increase carbon. By increasing electricity demand, transportation electrification could result in higher carbon content electricity. To date California's electricity and transportation sectors are separately planned for and regulated..

Purpose

This workshop brought together thirty stakeholders and experts, including representatives from automakers, regulatory agencies, electric vehicle charging firms, academics, energy storage firms, distributed energy firms, energy service providers, Investor-Owned Utilities, the Independent System Operator, and academic researchers, to explore and identify key areas that may need to be pursued to ensure a low to no carbon electricity system. Discussion focused on four key questions:

- Which scenario might ensure that Electric Vehicle (EV) electricity demand does not increase carbon content of electricity?
- What policies, actions might be needed for EVs to be used as a grid asset?
- What role might EVs have as a storage asset for buildings to reduce electricity demand?
- What role might smart grids, micro-grids, energy storage, distributed generation, and other strategies play?

Key Takeaways

√ **The carbon coefficient of electricity increases** if EV demand exacerbates peak load and system ramping needs, and needs are met by fossil fueled flexible resources**.**

√ **Scenarios to flatten the demand curve can avoid new fossil fuel resources,** such as dynamic load management, incentivizing daytime charging, and control systems that aggregate chargers to stagger charging times.

√ **We can reduce the need for fossil based flexible resources by increasing gridwide renewables combined with storage and optimized with multiple level strategies** (ISO system, distribution level, and consumer level) so that demand increases during high renewable supply and decreases at peak.

√ **Distributed Energy Resource distribution level services need to be defined and monetized.** Utility rate structure does not value services that flatten load profiles, charge at variable times, or manage volatility close to the source.

√ **Difficult to design incentives/regulations without knowledge of, or influence on, EV design.** It may be beneficial to develop vehicle design parameters for original equipment manufacturers (OEMs) that could maximize vehicle-to-grid opportunity.

√ **OEMs, IOUs, and regulators need to identify the technology, communications systems, and rules needed to implement Vehicle-Grid Integration and flatten the demand curve.**

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