

April 26, 2016 workshop at UC Davis

**PEV Infrastructure for Light Duty Transport in California (Sessions 1 and 4)**

Assessment of infrastructure needed, barriers, and ideas/solutions to accelerate commercialization of PEV infrastructure for LDVs:

Status

1. What is the status of PEV infrastructure in California?
2. Why is charging important for PEV adoption?
3. What are the current and projected growth rates of PEV infrastructure?
4. How much infrastructure is needed, and by when? How can infrastructure be built out in a timely manner?
5. What types of charging are important? For which types of vehicles? For which types of consumers?
6. What are current and emerging PEV infrastructure technologies and business models?
7. What is a feasible business case for public charging stations for both slow and fast charge?
8. What current and potential revenue streams are EVSE developers and operators pursuing, and how significant are each to future business growth (e.g., subscriptions, advertising, electricity/time usage fees, LCFS credits, etc.)?
9. What are the total costs for installing PEV infrastructure? What are the cost trends? Which components can achieve larger cost reductions?
10. With fast charging, what is the best battery size (kWh) and vehicle range from the driver convenience and economic points-of-view?
11. How is the PEV infrastructure market (players, roles, business models, profitability) changing?
12. What will be the role of the electric utilities and local governments in expanding public charging infrastructure?
13. How do credits play into PEV infrastructure commercialization?
14. How will the charging infrastructure be provided in the future if the market penetration of EVs grows from 3% to 25% to 50%?

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Barriers/Solutions

15. What are the barriers for further development of PEV infrastructure in the state?
16. How can rollout be made more efficient, from readiness planning through implementation?
17. How can the burden to consumers of charging be reduced?
18. How can costs to the consumer be reduced?
19. How can charging infrastructure be deployed to people without good access to chargers (e.g., in Multi unit dwellings, suburbs, rural areas)? What are the price differentials for different EVSE technology/installation options, and what are the greatest potential areas for cost reductions?
20. How can PEV infrastructure markets be expanded in the state?
21. What are game changer technologies and trends that we should be factoring into planning now?
22. How can total cost be embedded and stay within consumer budgets? What innovative cost structures can be provided, if necessary?
23. What are some creative ways to spur the market? What are automakers looking into that may change the paradigm?
24. What more can government do to help spur PEV infrastructure development to lead to more PEV adoption?
25. What role can/should government policy have in determining profitability?
26. How will the cost of infrastructure, needed to influence EV sales, be paid while market penetration increases? At what costs are incentives still needed, and for how long? (When should government incentives phase out?)

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**PEV Infrastructure for Freight and People Movement in California (Sessions 2 and 3)**

Assessment of infrastructure needed, barriers, and ideas/solutions to accelerate commercialization of PEV infrastructure for freight and people movement:

Status

1. What is the present status of PEV charging stations for MD-HD electric vehicles in California?
2. What are the state's goals in terms of sustainable freight and people movement?
3. What is the vehicle technology mix envisioned for sustainable freight in California? How important will electrification be?
4. Who is providing the hardware and stations, and who is owning and operating them? Is there interest among *light duty* charging manufacturers to develop products for non-light duty vehicles?
5. What are the charging requirements for the various types and sizes of MD-HD electric vehicles for the different applications?
6. What are the total costs for installing EV chargers in various non-light duty platforms, including bus, package delivery, drayage etc.? Discuss costs for equipment, installation, panel/transformer upgrades, and operational costs, including demand charges, and any projections on future costs.
7. What are cost trends for this infrastructure? How do we envision costs coming down over the next 5 – 10 years? For which components do we see larger opportunities for cost reduction?
8. How much of PEV infrastructure components is manufactured in CA vs. out of state?
9. How much of the infrastructure will be private vs. public for different applications?
10. Can there be a mix of light-duty and MD-HD charging infrastructure at a single public location?
11. How do credits play into PEV infrastructure commercialization?

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Barriers/Solutions

12. Is battery charging presently a barrier to the introduction of PEVs for freight and people movement?
13. What is the status of standards being developed for non-LDV platforms such as bus and port vehicles? Is there an emerging need to develop standards for other non-light duty platforms (drayage, refuse, delivery truck etc.)? Can these standards build upon existing standards for light duty (J1772) or build upon emerging standards for bus? Should all vehicle platforms conform to the same standards?
14. How will large-scale MH-HD EV infrastructure affect the grid? Are there electric utility constraints to the installation of battery charging facilities for high power commercial applications?
15. Are there standardized products (charging systems) becoming available for sale that meet the needs of high power charging facilities?
16. What changes need to happen in the private sector to expand deployment of infrastructure for non-light duty EVs?
17. What are game changer technologies and trends that we should be factoring into planning now?
18. How can government better support deployment of EV infrastructure in non-light duty platforms? Is there a potential role for EV infrastructure vouchers to complement HVIP?
19. How can government and industry work complementarily to support the development or adoption of new standards? When and how should standards organizations (SAE) be engaged?
20. What more can government do to facilitate PEV infrastructure rollout for non-LDVs? What incentives and programs are most useful now, and what new types are needed?
21. At which stage(s) would government incentives phase out?