

May 23, 2011

California Energy Commission
Docket Office, MS-4
Re: Docket No. 11-IEP-1L
1516 Ninth Street
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DOCKET 11-IEP-1D
DATE _____
RECD. <u>May 02 2011</u>

Re: Docket # 11-IEP-1L: 2011 IEPR-Transportation Fuels and Infrastructure

To Whom It May Concern:

On May 11, 2011, the California Energy Commission (“Energy Commission”) held a Transportation Committee Workshop on Transportation Fuel Infrastructure Issues (the “Workshop”) in connection with the 2011 Integrated Energy Policy Report (“2011 IEPR”). Southern California Edison Company (“SCE”) participated in the Workshop and appreciates this opportunity to provide these follow-up comments.

SCE’s comments will respond to the questions presented in the Attachment to the Workshop Notice related to issues that can affect availability and impacts of electric recharging.

1. *What are the estimated costs, timing, vehicle population requirements, and distribution of recharging infrastructure between private residential and public facilities?*
 - These factors are significant “unknowns” which will be dictated by consumer preferences over time. However, SCE anticipates (and encourages) that most Plug-In Electric Vehicle (PEV) owners will charge at home during nighttime, off-peak periods. Workplace and public charging will account for a much smaller percentage of the overall PEV charging load, and SCE expects that this infrastructure will continue to develop along market trends through private investment (e.g., businesses installing workplace charging), public funding (e.g., cities installing infrastructure), and public-private partnerships (e.g., federal stimulus funding for public charging).
 - While charge infrastructure options and associated costs vary widely based on individual circumstances, a “level 2” 240-Volt residential charger costs on average around \$2,500, whereas a typical public installation may cost between \$10,000 and \$15,000.
2. *What is adequate recharging infrastructure coverage over the next twenty years?*

- The answer to this question will depend on PEV adoption, the types of PEVs purchased, as well as the driving habits of their owners. For example, a plug-in hybrid (PHEV) with back-up from a gasoline engine or a battery electric vehicle (BEV) with a small commuting distance will not necessarily require any public / workplace infrastructure.

3. *How will electricity be charged to consumers and at what rates?*

- SCE residential customers currently have two electric vehicle rates to choose from (a whole house and a separately metered time-of-use (TOU) rate) as well as the option to remain on their current tiered domestic rate. SCE also offers two commercial PEV rates. The electric vehicle rate options are designed to provide customers with lower-priced off-peak time periods. For example, the residential TOU-EV-1 rate charges \$0.11 per kWh for charging that occurs after 9:00 PM and before noon. While these rates will change over time to adapt to customer demands and technological advancements, SCE anticipates that at the very least, PEV rates will continue to encourage charging behaviors through variable pricing which minimize grid impacts while potentially increasing overall system efficiency.

4. *The geographic distribution of electric-drive vehicles may vary considerably - What consequences might this have for distribution infrastructure requirements?*

- The concern for distribution infrastructure is not wide geographic adoption, but rather vehicle clustering on already ageing or overloaded circuits. As part of its current general rate case, SCE has filed for approximately \$70 million to address these concerns over the next three years. However, it should be noted that from a distribution planning perspective, PEVs are another piece of load growth, and represent a small fraction of the over \$2.3 billion request related to SCE's capital forecast for grid upgrades over the next few years. Going forward, PEV forecasts will be included in distribution system planning and standards formation as with any other new load growth variable.

5. *What portion of new electric vehicles sold into the market will be sold to fleets as opposed to residential-based consumers?*

- SCE expects a majority of vehicles will be sold to residential-based customers. This will likely vary widely by vehicle brand and PEV type.

6. *How will the large scale introduction of plug-in hybrids and full electric vehicles affect recharging infrastructure and what is needed to ensure that incremental vehicle electricity demand occurs off-peak?*

- See answers to questions # 4 and # 9.

7. *To what extent will the forecasted installation and use of public-charging stations impact peak electricity demand loads?*

- SCE anticipates that by 2020, load from electric vehicles will account for approximately 3% of its total electrical load served. In a high case forecast, this could increase to 6%. As for impacts on-peak, these will be determined by the customer education efforts as well as the load management rates and programs employed over the next decade (which may or may not be electric vehicle specific).
8. *How will multifamily dwellings and homeowners without attached garages charge plug-in electric vehicles? What will be the charging rates for these consumers?*
- Significant uncertainty remains for these customers. Many will have to rely on building ownership / management as well as potential private market arrangements. In other cases, these customers may charge at work or at public charging stations. There is not a “one size fits all” answer for multifamily dwelling charging questions. In as much, rates will also vary by the charging arrangement / location.
9. *What methods will be used to maximize the use of charging infrastructure given varying charging patterns and times? Are there methods to manage this charging?*
- There are two primary types of load management options for PEVs: rates and programs. By using variable pricing, rates can be used to encourage certain charging behaviors. These options are already deployed, although they will continue to be refined. Programs, such as event-driven peak system load demand response, may also be used. In the future, programs which help to manage the charge state of a vehicle within a longer time period or balance intermittent renewable generation fluctuations can be envisioned. These types of load management measures are currently in development as part of a larger ongoing “smart grid” discussion.

Thank you again for the opportunity to offer these comments and please feel free to contact me if you have any questions concerning the matters addressed herein.

Sincerely,

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