

April 24, 2014

**VIA E-MAIL DOCKET@ENERGY.
CA.GOV**California Energy Commission
Dockets Office, MS-4
Re: Docket No. 14-IEP-1B
1516 Ninth Street
Sacramento, CA 95814-5512

California Energy Commission

DOCKETED**14-IEP-1B****TN 72962****APR 25 2014**

Re: 2014 Integrated Energy Policy Report: Comments of Pacific Gas and Electric Company on the Lead Commissioner Workshop on Transportation over the Next 10 Years

I. INTRODUCTION

Pacific Gas and Electric Company (“PG&E”) appreciates the opportunity to provide comments on the Lead Commissioner Workshop on Transportation Technology over the Next 10 Years (“Workshop”), held on April 10, 2014, as part of the 2014 Integrated Energy Policy Report (“IEPR”) Update. The Workshop focused on the status of key alternative and renewable fuels, fueling infrastructure, and vehicle technologies.

As stated in previous comments, PG&E supports California’s climate change policies and believes that the transportation sector provides significant opportunities for greenhouse gas (“GHG”) emissions reductions. At the Workshop, the CEC requested stakeholder feedback on four topic areas: hydrogen fueling systems, electric vehicle (“EV”) charging networks, zero emission vehicles (“ZEV”) and near-ZEV medium and heavy duty vehicles, and biofuels. In these comments, PG&E focuses on EV charging networks, and ZEV and near-ZEV trucks as these technology areas have the greatest connection to PG&E’s operations and knowledge base.

II. ELECTRIC VEHICLES CHARGING NETWORK

The CEC requested stakeholder feedback for the following questions related to the State’s electric vehicle charging network. Below are PG&E’s responses.

1. Do we have the fundamental technologies that are needed for a mass market EV charging system, or are additional technology innovations needed?

While the fundamental charging technologies currently exist to support development of the EV market, additional technology advancements would further enable a mass market EV charging system. For example, the cost inefficiencies associated with current charging technology may challenge the viability of a widespread EV charging system. Additional technology innovation that can improve the overall value proposition of charging infrastructure and enhance customer engagement has the potential to help accelerate the market. Additionally, innovation is needed to develop charging station interoperability of various networks in order to grow a sustainable market. PG&E looks forward to working collaboratively with other interested stakeholders to identify opportunities for further technological innovation that will facilitate a widespread charging network that is convenient to customers.

2. Do we have the fundamental tools to create a widespread, consumer friendly charging network, or are additional business, technology or regulatory measures needed?

In order to create a widespread, consumer friendly charging network, it is important to recognize regional diversity and its implications on charging needs. Within regions, differences in population density require different types of charging infrastructure. For example, urban areas may have different charging infrastructure placement strategies at residential, workplace and public locations when compared to more rural areas. Varied power levels for charging infrastructure could play significantly different roles as well. For instance, if automotive manufacturers choose to offer larger batteries that ensure longer driving range, consumers may require higher power levels for charging, such as direct current fast charging. Placement of a reliable and convenient charging network is critical to building consumer confidence in electric transportation technologies in both urban and rural areas.

3. How can ARFVTP funding be used to overcome specific technology and market barriers?

From the research that PG&E has conducted, the major barriers to EV adoption are (1) the upfront cost of the EV itself; (2) the range and associated amount and location of available retail EV charging infrastructure; and (3) consumer knowledge and awareness of the benefits and costs of EVs. PG&E believes that Alternative and Renewable Fuel and Vehicle Technology Program (“ARFVTP”) funding can accelerate adoption by addressing these three major barriers. ARFVTP funding currently addresses some of these market barriers through EV rebates (via the Clean Vehicle Rebate Project) and incentives for charging infrastructure. Funding could also be used to promote the awareness of available charging infrastructure in order to build range confidence for EV

consumers. Examples include standardizing all signage and deploying signage to raise awareness of where charging stations are located. This would include the blue sign program on federal and state thoroughfares as well as directional signage on secondary roadways.

4. What role can electric drive vehicles play in helping to meet California's climate policy goals through 2023 and beyond?

PG&E believes that electrifying the transportation sector has the potential to provide significant opportunities for GHG emissions reductions. EVs produce less GHG emissions than conventional vehicles. Since lifecycle emissions of EVs depend on the electricity mix used to power the vehicle, and PG&E's electricity mix is increasingly carbon free, EVs can help play a major role in helping to meet California's future climate change goals.

III. ZEV AND NEAR ZEV MEDIUM AND HEAVY DUTY VEHICLES

The CEC requested stakeholder feedback for the following questions related to the emerging EV market. Below are PG&E's responses.

1. In advance of the pending 2023 federal regulatory NOx requirements for truck emissions, what level of market penetration and acceptance can be achieved through 2023 for ZEV and Near-ZEV trucks?

PG&E is currently working with two small manufacturers based in California to develop extended range electric work trucks. PG&E has also purchased a small number of full battery electric work trucks. Based on experience to date, PG&E believes that battery technology does not yet achieve the cost to energy density that may be required for many medium and heavy duty vehicle applications. While PG&E is unable to forecast market penetration at this early stage in the emerging market, overcoming the aforementioned barrier would improve opportunities for ZEV and near-ZEV trucks.

PG&E believes that natural gas can replace diesel in near-ZEV medium and heavy duty vehicle classes to help reduce GHG emissions. PG&E believes that the lack of well-placed and reliable fueling infrastructure is the common barrier to adoption for all vehicle classes. PG&E continues to explore the market potential for alternative transportation fuels with a focus on electricity and natural gas applications to support California's environmental policies.

2. What key technology and cost challenges must be surmounted?

Based on its experience to date, PG&E believes that battery technology does not yet achieve the cost per energy density that may be required for many medium and heavy

duty vehicle applications. Increasing investment for battery technology innovation to improve battery energy density and cycle life are areas of opportunity that warrant funding support. Fueling infrastructure also poses a cost challenge. PG&E believes that the lack of well-placed and reliable fueling infrastructure is the common barrier to adoption for all vehicle classes.

3. Assuming that technology and cost issues can be resolved, what needs to occur to spur market demand and acceptance in a conservative, cost-conscious industry?

Information related to total cost of ownership is needed to spur market demand and acceptance. Additionally, market incentives, which help improve the total cost of ownership value proposition, can also support market acceptance. Investments in well-placed reliable fueling infrastructure may increase ZEV and Near ZEV miles traveled and provide consumers and fleet operators with the confidence in technologies, which could translate into higher market demand.

4. How can ARFVTP funding be used to overcome specific technology and market barriers?

For medium and heavy-duty ZEVs and Near ZEV, funding should be focused on improving the value proposition by reducing market entry and upfront costs. For example with medium and heavy duty EVs, the CEC could link this funding to battery size to reward increased range, which is consistent with the Federal EV tax credit approach. Other performance targets that can be rewarded with incentive premiums are improved drivetrain and auxiliary load efficiencies, as these approaches will also increase ZEV range. Investments in well placed reliable fueling infrastructure may increase ZEV and Near ZEV miles traveled and provide consumers and fleet operators with the confidence, which could translate into higher market demand.

5. What role can zero and low emission advanced technology trucks play in helping to meet California's climate policy goals through 2023 and beyond?

PG&E has identified a significant number of daily deployed work trucks (757) that can operate electric power take off ("EPTO") to eliminate engine idling at worksites resulting in emissions reductions. To date, 530 EPTO trucks have been deployed by PG&E. Most commercial fleets will have some applications within their daily operations that can leverage electric drive technologies to lower fleet emissions, operating costs and noise, improve safety, and increase vehicle life.

Sharing best practices across a variety of fleets and more case studies are needed to spread the environmental and economic benefits of adopting electric transportation technologies. If costs and technology barriers can be effectively addressed to encourage fleet electrification and technology acceptance, freight and heavy duty fleet applications can play a significant role in helping meet California's climate policy goals.

IV. CONCLUSION

PG&E appreciates the opportunity to provide these comments and looks forward to further participating in the 2014 IEPR Update. Please do not hesitate to contact me if you have any questions or need additional information.

Sincerely,

/s/

Matthew Plummer

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