Joint Oversight Hearing
Assembly Transportation Committee
Assembly Utilities and Commerce Committee
"In Support of Electric Vehicles: Building Cars, Providing Power, Disposing Batteries"

Remarks of Commissioner Nancy E. Ryan
California Public Utilities Commission

Monday, May 24, 2010

Thank you for inviting me to testify at today's hearing on behalf of the California Public Utilities Commission.

The PUC is excited to be part of an active dialogue with the California Air Resources Board, California Energy Commission, legislature and other state and local agencies to pave the way for significant increases in electric vehicle usage in the coming years.

Introduction

Electric vehicles present a major opportunity to save energy, cut greenhouse gas emissions, improve air quality, and save drivers money.

The transportation sector accounts for over half of the energy consumed in California and generates 38% of the state's greenhouse gas emissions.[1]

According to a recent study conducted by the Electric Power Research Institute and the Natural Resources Defense Council, the widespread adoption of plug-in hybrid electric vehicles could result in annual greenhouse gas reductions of over 400 million metric tons nationwide by 2050.[2] That's equal to about a quarter of all the greenhouse gas emissions from the US transportation sector in 2008.[3]

The same study projects electric vehicles could result in significant reductions in particulate matter emissions in California, and improvements in visibility in southern California.[4]

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[1] Murtishaw, S., L. Price, S. de la Rue du Can, E. Masanet, E. Worrell, J. Sathaye. 2005. *Development of Energy Balances for the State of California.* California Energy Commission, PIER Energy-Related Environmental Research. CEC-500-2005-068, p. 11*;* California Air Resources Board, *Climate Change Proposed Scoping Plan*, October 2008, p. 11.

[2] Electric Power Research Institute and Natural Resources Defense Council, *Environmental Assessment of Plug-in Hybrid Electric Vehicles, Volume 1: Nationwide Greenhouse Gas Emissions*, Final Report, July 2007, p.2.

[3] United States Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2008*, p. ES-8.

[4] Electric Power Research Institute and Natural Resources Defense Council, *Environmental Assessment of Plug-in Hybrid Electric Vehicles, Volume 2: United States Air Quality Analysis*, Final Report, July 2007, pp. 6-8, 6-10.

Electric vehicles have been around at least since the days of Thomas Edison. However, today we are seeing a new renaissance of electric transportation, and California is leading the way.

As evidence of this, last March, when President Obama announced important federal commitments to electric transportation, he chose Southern California Edison's electric vehicle technical center in Pomona as the setting for his announcement.

Last week's announcement that Palo Alto-based Tesla motors has partnered with Toyota to build electric vehicles in the NUMMI plant in Fremont is a further indication that California is becoming a hub of electric vehicle investment.

The state is also the home of leading charging service providers such as Better Place and Coulomb Technologies. Similarly, our California utilities are recognized national leaders in electric transportation.

The CPUC's Role

While electric vehicles are referred to as "zero emission vehicles", of course, that is not true in the broadest sense. Instead of emitting tailpipe emissions, electric vehicles contribute to power plant emissions. Fortunately, in California we have an electric system that is relatively clean, and getting cleaner.

Increasd electric vehicle use will require more electricity production and will also place new demands on the state's distribution and transmission system. However, electric vehicle usage can benefit all ratepayers, for example, by helping to better integrate renewable energy.

Electric vehicles' reliance on the electric system presents a number of important challenges that the California Public Utilities Commission is addressing.

CPUC Rulemaking

In May of last year, the PUC's Policy and Planning Division issued a white paper examining potential barriers and opportunities for light-duty vehicle electrification in the state. The white paper drew upon extensive stakeholder input to identify what the California utilities need to do to prepare for the introduction of electric vehicles.

The white paper recommended that the Commission open a rulemaking to consider measures to reduce barriers to electrification.

Then in August of 2009, the PUC launched a new electric vehicle rulemaking. Through the rulemaking the PUC seeks to ensure that the electric grid is ready for electric vehicles. We are considering infrastructure, rates, and policies to support these new vehicles. The rulemaking is also addressing the requirements of Senate Bill 626 (Kehoe),

signed into law last year. SB 626 requires the CPUC to evaluate policies and set the rules necessary to provide fueling infrastructure for plug-in hybrid and electric vehicles.

In theory there is more than enough excess electric generation, transmission, and distribution capacity to support millions of electric vehicles. One recent study found that the nation's existing electricity infrastructure has sufficient available capacity to fuel 84% of the nation's cars, pickup trucks, and SUVs on electricity. The reason for all that excess capacity is that the grid is built to meet peak demand, even though much of the time demand is only one-half to one-third of that peak.

However, the reality is more challenging. Much of the excess capacity is available in the middle of the night. What if a car owner needs to charge his or her vehicle in the day? We will need to develop incentives to encourage electric vehicle owners to charge their cars at times when electricity is not in peak demand and will need to make some upgrades to the network to address situations where the vehicles must be charged at peak times.

The utilities have also made us aware of challenges they expect at the local level. What if certain parts of the electric grid see a large concentration of vehicles? Will the local wires and transformers be adequate? When the Toyota Prius was first introduced certain neighborhoods purchased the cars in a much higher concentration than the rest of the state. We anticipate that the same patterns will occur with plug-in electric vehicles. Those high concentration neighborhoods will more likely need upgrades to their distribution network before many cars can be plugged in.

Rates / Smart Charging

To prevent any negative impacts on the grid, the PUC is examining policies to encourage vehicle owners to charge off-peak. For example, in the 1990s, during the last period of interest in electric vehicles, the PUC adopted time-of-use rates for the three large investor-owned utilities. Time-of-use rates charge a customer more for charging in the day and less at night, thus, discouraging charging in the day when the grid is strained. In our current rulemaking we are reviewing those rates and will make changes as needed.

We are also examining what is sometimes referred to as "smart charging", which would allow the car owner to allow the utility or charging provider to stop and start vehicle charging based on the state of the electric grid.

For example, vehicles could charge when wind farms are producing power, then stop when the wind dies down. Fortunately, the California Independent System Operator's wholesale energy markets are well suited to communicate the condition of the grid through wholesale energy markets, so enabling this type of Smart Charging is feasible in the near term.

Further, in the future we could even see electric vehicles discharging energy to the grid at certain times. In other words, electric vehicles can become a form of energy storage for the grid and could be used as an addition source of electricity at peak times.

We are also investigating cost issues. If investments are made in the grid to support electric vehicles, who pays?

Again, electric rates can be designed to ensure that customers pay for their fair share of distribution and transmission infrastructure costs. For example, demand charges may be appropriate to allocate costs and discourage charging that impacts the transmission and distribution system.

Encouraging Investment in Charging Infrastructure

The PUC is working with the Air Resources Board and Energy Commission to ensure that there is sufficient charging infrastructure to support electric vehicles.

This past March, the PUC, ARB, and CEC held a joint workshop to identify ways to accelerate the installation of home charging equipment. Anecdotally, we have heard that it takes 30 to 45 days for a homeowner to get charging equipment installed. The equipment is not difficult to install, but the delay arises in the hand-off of responsibility from one participant in the process to another.

There are many more entities involved in purchasing an electric vehicle then a gasoline powered cars. Not only does the new electric vehicle customer need to negotiate with the manufacturer and the dealer, but before he or she takes the car home the customer must work with someone to install the charging equipment in their home, with the local utility, and with the local government permitting and inspection officials.

At the workshop we learned about a number of successful local efforts to streamline the process, but more work still needs to be done.

The PUC is also looking at policies related to commercial charging stations, also known as charge spots.

The Energy Commission has announced funding from the AB 118 Alternative and Renewable Fuel and Vehicle Technology program for charging infrastructure projects throughout the state. The PUC will be working collaboratively with CEC and utilities we regulate to support public and commercial charging infrastructure network in the near term.

One question that was raised early in our rulemaking is whether providers of charging services are electric utilities under the Public Utilities Code. We are aware of a number of non-utility companies that are beginning to invest in charge spots. Potential investors in charging infrastructure and utilities asked the PUC to address this important question before they move forward with important investments.

The PUC released a proposed decision on this question last Friday. The proposed decision reviews law and past precedent, especially in the area of compressed natural gas, and concludes that electric charging providers are not utilities.

The decision notes that publicly utility regulation is not needed since vehicle fueling is not a natural monopoly. We believe that through our jurisdiction to set transmission, distribution, and generation rates we can create incentives to manage local and bulk grid impacts.

The decision also states that the PUC will investigate whether there are any health and safety concerns related to charging that should be addressed through utility interconnection policies or legislative action.

The decision is now going through a public comment period. The full PUC could act on the decision as early as late June.

The PUC also wants to ensure that lower income communities have access to charge spots. If automakers introduce vehicles that are accessible to lower income purchasers, the infrastructure needs to be there to support charging of these vehicles.

Conclusion

Thank you again for inviting me to testify at today's hearing.