



## Transportation Committee

May 8, 2014

### Electric Vehicle Charging Infrastructure Funding Program

**Issue:** SACOG and project partners would like to create a regional program to fund charging stations in public places for plug-in electric vehicles (PEV).

**Recommendation:** None, this item is for information only. Action will be taken by the Land Use & Natural Resources Committee.

**Discussion:** In December of 2013, the SACOG Board adopted the region's first PEV readiness and infrastructure plan, called TakeCharge. TakeCharge outlines steps necessary to prepare the region for an increased number of electric vehicles on our roads. Much of this work is under way now, and SACOG continues to work with its member jurisdictions on taking steps to become more PEV ready.

The next phase of TakeCharge moves from readiness to implementation of the infrastructure plan. The plan forecasted how many, what levels, and where chargers should be placed in the region. TakeCharge was created to provide a network of PEV chargers in a way that provides opportunities for numerous drivers, uses equipment in as efficient a manner as possible, considers the impact charging has on local electricity grids, and doesn't overburden local cities and counties with stranded infrastructure. While PEV charging in homes and workplaces will be dictated largely by who is purchasing PEVs, public charging offers an opportunity to provide charging for a variety of trip purposes and users. This ranges from trips passing through the region to people living in multi-family units to people shopping in commercial corridors.

TakeCharge estimates the need for 41 Level1 chargers, 124 Level2 chargers, and 73 DC Fast Chargers in the region by 2025. Currently, there are few available funds to provide for this charging, and existing funds can be difficult to obtain. In order to be more competitive for external funding opportunities that staff believes will be made available, SACOG would like to create a program to facilitate implementation of the public charging portion of the PEV infrastructure plan. Through the program, SACOG would seek funding that can be used to purchase and install PEV chargers in publically accessible locations throughout the region. If the program is created, staff will solicit input from the Board on how best to secure and allocate funds.

Approved by:

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Attachment

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# PEV Infrastructure Funding Program

## Background

The regional Plug-In Electric Vehicle (PEV) Infrastructure and Readiness Plan (TakeCharge), adopted by the SACOG Board in December of 2013, outlines strategies and infrastructure requirements to meet the needs of PEVs on the region's roads today through 2025. PEV readiness looks at what measures need to be implemented in order to make the transition for consumers and fleet operators to electric vehicles as easy as possible. The infrastructure plan looks at current and forecasted demand for PEV chargers, and selects how many, what kind, and where chargers should be placed. TakeCharge forecasts approximately 75,000 PEVs by 2025, and these two components of the plan work together to prepare the region for vehicles.

## *Benefits of PEVs*

PEVs have many financial and environmental benefits. PEVs have a lower operating cost, as electricity is a less expensive source of fuel compared to other sources such as petroleum, and they have fewer parts that require maintenance. PEVs also have fewer or no tailpipe emissions, making them a relatively clean source of transportation. These benefits are seen by both the consumer as well as society at large.

From a societal perspective, the reduction in tailpipe emissions lowers the amount of pollutants such as ozone and GHGs. This has health and regulatory benefits. For SACOG, which must show how it intends to reach GHG emission targets through the implementation of the Metropolitan Transportation Plan and Sustainable Communities Strategy (MTP/SCS), this means a reduction in regional GHG emissions through the advancement of clean transportation technology. Technological advancements, as well as incentives for travel options, will help the region to meet the SB 375 GHG emissions reductions target. To implement the MTP/SCS, SACOG has sought and received funding to create a regional climate action plan to develop more specific GHG reduction strategies for land use and transportation, and has worked with local and regional partners on TakeCharge. The proposed funding program here would be the next step in realizing GHG savings for consideration in future MTP/SCS updates.

## *Readiness*

PEV readiness consists of three main groups of specific elements. These groups are:

1. Raising Public Awareness of PEVs: Readiness elements that try to raise public awareness include education and outreach to consumers and fleet operators on the benefits of PEVs, creating demonstration projects on the use of PEVs and charging, showcasing technology, and creating a unified message on PEV ownership.
2. Creating Local Incentives for the Purchase and Use of PEVs: Incentives include cash incentives for the vehicle, incentives for the purchase or installation of chargers, and even for their use. Incentives for the use of PEVs could include parking, tolls, HOV lanes, charging, and electricity rates.

3. Providing Opportunities for PEV Charging: Readiness on charging can be in the form of having a streamlined process for permitting the installation of a charger, requiring charging infrastructure be included in all new buildings, and consideration of charging in building ordinances and zoning codes.

## ***Infrastructure***

TakeCharge uses the vehicle forecast and modeled travel behavior to estimate the amount, location, and type of charger required. This estimate is broken into categories of chargers located at *Residential* locations (homes, apartments, condos, etc.), *Workplaces*, and general *Public* places (parking garages, retail spots, on-street, etc.). One way to think about these different locations is the length of the stay in each place.

Chargers in Residential locations, where the car is parked for longer periods of time, can be lower levels – Level 1 (L1) and some Level 2 (L2) to get a full charge. Workplace charging, where the car is parked for 4 to 10 hours, require slightly higher levels of charging – some L1 and more L2 to get a full charge. Public chargers, where cars are usually parked for shorter periods of time, need fast charging – some L2 and DC Fast charge.

Most demand for Residential charging can be met with the charger that the PEV is equipped with and a standard 110V or 220 V outlet found in most homes and garages. When installed, Workplace charging, which can be viewed as an incentive for both the employee and employer, is often provided by the property owner. Public charging, has the most barriers, as funding is often difficult to secure, but potentially the highest impact in terms of use and visibility to existing and potential PEV drivers.

## **Program Proposal**

### ***Need***

Considering the location, level, and available resources, the proposed program would seek a funding source for Public chargers throughout the SACOG region. TakeCharge estimates the need for 41 L1 chargers, 124 L2 chargers, and 73 DC Fast chargers in the region by 2025.

### ***Cost***

There are two main factors when considering the cost of providing Public PEV charging, the hardware costs and the installation costs.

Hardware costs are mostly fixed, and vary mostly by level of charging and the equipment needed for installation (installing on a wall versus a stand). L1 and L2 chargers typically cost in the \$500 to \$1500 range, while DC Fast chargers range from \$15,000 to \$90,000. L1 and L2 typically don't require additional hardware unless a separate meter is desired. DC Fast chargers, however, usually require additional electrical hardware on site. For the purposes of this proposal, an average cost of \$1,000 for L1 and L2, and \$30,000 for DC Fast was assumed.

Installation costs can vary greatly based on where they are installed in relation to the electrical supply and transmission, if trenching is required, and any permitting fees. For this proposal, an average cost of \$5,000 for L1 and L2 installs, and \$40,000 for DC Fast was assumed.

Combining the hardware with the installation costs results in an average price of \$6,000 for L1 and L2, and \$70,000 for DC Fast chargers. This equates to a total of approximately \$6 million for Public charging in TakeCharge. If funding were available once every two years, the cost would be \$484,000 per year over the life of the plan.

### ***Location Assessment***

With assistance from The Plug-In Hybrid and Electric Vehicle Research Center at UC Davis, TakeCharge created a method for assessing the most efficient locations for PEV chargers. The analysis looked at existing and forecasted PEV owner demographics, current and forecasted driving patterns, and current and forecasted land uses to determine the need for charging in particular locations. This method can be used to help assess proposed charger locations.

### ***Funding***

The program proposed is to seek funds up to \$400,000 to implement the initial phase of Public PEV charging.