

DOCKETED

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Project Title:	Vehicle Grid Integration Roadmap Update
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Workshop Schedule for California Vehicle-Grid Integration Roadmap Update

Monday and Tuesday, October 29-30, 2018

October 29, 2018: Technology Showcase from 10:00 a.m. to 12:00 p.m.

Workshop Panels beginning at 1:00 p.m.

October 30, 2018: Workshop Panels beginning at 9:00 a.m.

CALIFORNIA ENERGY COMMISSION
1516 Ninth Street
First Floor, Rosenfeld Hearing Room
Sacramento, CA
Wheelchair Accessible

Overview: Staff will lead a two-day public workshop to solicit public and stakeholder input on proposed actions, responsible entities, and prioritization to include within the Vehicle-Grid Integration (VGI) Roadmap Update. Expert panelists representing the automotive, charging, electric utility industries, research laboratories and environmental and customer organizations will discuss their recent work pertaining to VGI policy and planning, economic potential, technology needs, and the customer experience.

The updated VGI Roadmap Matrix and the discussion questions below will inform the topics that will be explored during the workshop panels. An updated VGI Roadmap Matrix is available here:

<https://www.energy.ca.gov/transportation/vehicle-grid-integration/documents/index.html>

The primary objective of the workshops is to gather information, through panelist and audience interaction, that staff can use to develop and prioritize proposed actions that are assigned to responsible entities to advance the integration of transportation electrification with the electric grid. These proposed actions and assignments will be made available following the workshop and comment period in a draft roadmap update for public review and comment.

To save resources, we encourage attendees to download workshop presentations from the Commission's Docket: <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=18-MISC-04>

October 29, 2018 Schedule

Time	Item
10:00 a.m. – 12:00 p.m.	Technology Showcase (First Floor Atrium) <i>The showcase will feature a variety of organizations and their VGI-related technologies and projects to provide an opportunity for the public to become more familiar with smart charging and advanced vehicles.</i>
12:00 p.m. – 1:00 p.m.	LUNCH BREAK

<p>1:00 p.m. – 1:20 p.m.</p>	<p>WELCOME AND OPENING REMARKS</p> <ul style="list-style-type: none"> ➤ Welcome and Housekeeping <ul style="list-style-type: none"> • Eli Harland, California Energy Commission ➤ Opening Comments <ul style="list-style-type: none"> • Kevin Barker, Deputy Director, Fuels and Transportation Division ➤ Overview of process to update the VGI Roadmap and Discussion Document
<p>1:20 p.m. - 3:00 p.m.</p>	<p>DISCUSSION PANEL 1: Policy and Planning</p> <p><i>The policy and planning panel will focus on the interactive factors that affect the integration of transportation electrification with the electric grid and whether and how these factors are aligned with achieving widespread deployment of managed vehicle charging and discharging.</i></p> <hr/> <p>Discussion Questions:</p> <ol style="list-style-type: none"> 1) What solutions or strategies can create a more cohesive policy framework for integrating transportation electrification with the grid? 2) How should policymakers characterize and leverage VGI as a distributed energy resource that travels across charging networks, utilities, and balancing areas? 3) How can the state develop more consistent procurement and program requirements that leverage technology standards where appropriate to create a robust, competitive market for VGI solutions? 4) What changes to energy and transportation planning or utility business models are necessary to realize the full potential of VGI at the scale of at least 5 million vehicles by 2030? <hr/> <p><u>Panelists:</u></p> <ul style="list-style-type: none"> • Noel Crisostomo (Moderator), California Energy Commission • Matt Stanberry, Advanced Energy Economy • Jamie Fine, Environmental Defense Fund • Hannah Goldsmith, California Electric Transportation Coalition • Jeremy Whaling, American Honda Motors • David Schlosberg, eMotorWerks <hr/> <p><u>Public Participation:</u></p> <ul style="list-style-type: none"> • Stakeholders suggest actions, responsible entities, and their prioritization to resolve barriers to VGI • Respond to panelist presentations

3:00-3:10 p.m.	BREAK
3:10 p.m. – 5:00 p.m.	<p>DISCUSSION PANEL 2: Economic Potential</p> <p><i>The economic potential panel will focus on the range of grid integration requirements and costs to achieve California’s transportation electrification goals, including the cost and benefits of different managed charging and discharging scenarios.</i></p> <hr/> <p>Discussion Questions:</p> <ol style="list-style-type: none"> 1) How can utility programs provide economic incentives for drivers and charging network operators to manage charging? How can programs - ranging from rates, incentives, and procurements - account for circuit-level and system conditions to avoid overloading and integrate renewables? How will advanced technology facilitate customers’ participation in one or multiple programs? 2) What information collected from transportation electrification investments from the CPUC or CEC can be used to understand the costs and benefits of smart charging? How do these costs and benefits change under different scales or program designs? 3) How can VGI resources be better represented in utility and state planning efforts? What near-term improvements to distribution upgrade methodologies and operational systems are possible? How can VGI be incorporated into long-term, integrated resource planning efforts? 4) Given the rapid pace of transportation electrification across many segments, how can policymakers, researchers, utilities, and industry cooperate to identify and harness the benefits of VGI? What research areas will be most effective to understand needs and opportunities for the stakeholders involved in a fully-electrified transport sector by 2045, or sooner? <hr/> <p>Panelists:</p> <ul style="list-style-type: none"> • Carolyn Sisto (Moderator), California Public Utilities Commission • Cynthia Fang, San Diego Gas & Electric • Dean Taylor, Southern California Edison • Eric Cutter, Energy and Environmental Economics • Jason MacDonald, Lawrence Berkeley National Laboratory • Pamela MacDougall, Natural Resources Defense Council <hr/> <p>Public Participation:</p> <ul style="list-style-type: none"> • Stakeholders suggest actions, responsible entities, and their prioritization to resolve barriers to VGI

	<ul style="list-style-type: none"> Respond to panelist presentations
5:00 p.m. – 5:10 p.m.	<p>WRAP UP AND ADJOURNMENT</p> <ul style="list-style-type: none"> ➤ Day 1 Closing Remarks <ul style="list-style-type: none"> Siva Gunda, Deputy Director, Energy Assessments Division ➤ Adjourn

October 30, 2018 Schedule

Time	Item
9:00 a.m. – 9:15 a.m.	<p>WELCOME AND OPENING REMARKS</p> <ul style="list-style-type: none"> ➤ Welcome and Housekeeping <ul style="list-style-type: none"> Eli Harland, California Energy Commission ➤ Opening Comments <ul style="list-style-type: none"> Laurie ten Hope, Deputy Director, Research and Development Division
9:15 a.m. – 12:00 p.m.	<p>DISCUSSION PANEL 3: Technology Needs</p> <p><i>The technology needs panel will focus on VGI-enabling technologies, including cyber-security, for all vehicle classes to advance managed charging and discharging and enable the actions to be identified in the roadmap update.</i></p>
10 minute break ~ 10:30 a.m. after panel	<p>Discussion Questions:</p> <ol style="list-style-type: none"> 1) What types of analytical models are needed to link charging demand with grids operating at high penetrations of renewable electricity, against the backdrop of changing consumer mobility needs and the electrification of larger vehicle classes and additional modes of transportation? 2) Which new technologies should be incorporated into electric vehicles and equipment to improve cybersecurity? What are the technical barriers or requirements to advancing low-cost cybersecurity measures? 3) What standards and methods of communication need to be considered in VGI programs (e.g. involving unidirectional, bidirectional, high-powered, inductive, or pantograph charging, and potentially involving automated connections)?

	<p>4) Which charging use cases would most benefit from EVSE-embedded metering? What can be learned and commercialized from the utilities' submetering pilots? How can the state and network developers balance metering records-keeping requirements with the need for cost-effective solutions? Does NIST Handbook 44 provide the solution or a starting point?</p> <p>5) How can policymakers, researchers, and industry foster advanced technologies into to a global, vibrant e-mobility market to save customer costs and minimize emissions?</p>
	<p><u>Panelists:</u></p> <ul style="list-style-type: none"> • Matt Fung (Moderator), California Energy Commission • Joshua Eichman, National Renewable Energy Laboratory • Kenneth Rohde, Idaho National Laboratory • Celia Dayagi, Siemens • Jacqueline Piero, Nuvve • Sunil Chhaya, Electric Power Research Institute • Oleg Logvinov, Charging Interface Initiative • Barton Sidles, Hsubject
	<p><u>Public Participation:</u></p> <ul style="list-style-type: none"> • Stakeholders suggest actions, responsible entities, and their prioritization to resolve barriers to VGI • Respond to panelist presentations
<p>12:00 p.m. – 1:00 p.m.</p>	<p>LUNCH BREAK</p>
<p>1:00 p.m. – 3:30 p.m.</p> <p>10 minute break ~ 2:15 p.m. after panel</p>	<p>DISCUSSION PANEL 4: Customer Experience</p> <p><i>The customer experience panel will focus on fostering a positive and enriching customer (driver or owner) experience as a key element to increasing PEV adoption and integrating transportation electrification with the electric grid, including the barriers and actions to expand PEV and VGI in disadvantaged and low-income communities.</i></p> <p>Discussion Questions:</p> <ol style="list-style-type: none"> 1) What are the most robust ways to account for consumer behavior within utility grid planning forecasts and technical analyses? 2) How effective are VGI-related consumer outreach and education efforts? What information and framing is needed to expand cost-effective transportation electrification opportunities to all types of vehicle customers and disadvantaged communities?

	<p>3) To what extent can VGI technologies improve air quality and criteria pollutant emissions in specific disadvantaged communities, particularly from expanded use of renewable energy or reductions in the dispatch of local conventional power plants?</p> <p>4) How can technologies solve customer barriers to participating in smart charging rates, maximize driver cost savings, and reduce overall impacts on ratepayers?</p> <hr/> <p><u>Panelists:</u></p> <ul style="list-style-type: none"> • Eli Harland (Moderator), California Energy Commission • Byron Washom, University of California San Diego • Doug Black, Lawrence Berkeley National Laboratory • Samveg Saxena, Lawrence Berkeley National Laboratory • Carlo De La Cruz, Sierra Club • Eric Borden, The Utility Reform Network • Rick Kubin, Grid Democracy <hr/> <p><u>Public Participation:</u></p> <ul style="list-style-type: none"> • Stakeholders suggest actions, responsible entities, and their prioritization to resolve barriers to VGI • Respond to panelist presentations
<p>3:30 p.m. - 4:30 p.m.</p>	<p>PUBLIC COMMENTS</p> <ul style="list-style-type: none"> ➤ Topics that require additional discussion time ➤ Questions and Answers
<p>4:30 p.m. - 5:00 p.m.</p>	<p>WRAP UP AND ADJOURNMENT</p> <ul style="list-style-type: none"> ➤ Day 2 Closing Remarks and Next Steps <ul style="list-style-type: none"> • Peter Klauer, California Independent System Operator • Carolyn Sisto, California Public Utilities Commission • Stephanie Palmer, California Air Resources Board • Rey Gonzalez, California Energy Commission ➤ Adjourn