Meeting Notice and Agenda

Joint Meeting of the Regional Planning Technical Working Group and the Regional Energy Working Group

The Regional Planning Technical Working Group (TWG) and the Regional Energy Working Group (EWG) may take action on any item appearing on this agenda.

>>> Please note start time and location. This joint meeting will follow the TWG meeting, which starts at 12:30 p.m. <<<

Thursday, November 8, 2018
1:15 to 3:15 p.m.

SANDAG, Board Room
401 B Street, Suite 800
San Diego, CA 92101

Please take the elevator to the 8th floor to access the meeting room.

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Agenda Highlights

- SANDAG Roadmap Program Update
- SANDAG Electric Vehicle Efforts Update
  - Plug-in San Diego
  - Regional EV Charging Program

Please silence all electronic devices during the meeting

Mission Statement
The 18 cities and county government are SANDAG serving as the forum for regional decision-making. SANDAG builds consensus; makes strategic plans; obtains and allocates resources; plans, engineers, and builds public transit; and provides information on a broad range of topics pertinent to the region's quality of life.
Welcome to SANDAG. Members of the public may speak to the Working Group on any item at the time the Working Group is considering the item. Please complete a Request to Comment form and then present the form to the Working Group coordinator. Members of the public may address the Working Group on any issue under the agenda item entitled Public Comments/Communications/Member Comments. Public speakers are limited to three minutes or less per person. The Working Group may take action on any item appearing on the agenda.

Both agenda and non-agenda comments should be sent to SANDAG via comment@sandag.org. Please include the Working Group name and meeting date, agenda item, your name, and your organization. Any comments, handouts, presentations, or other materials from the public intended for distribution at the meeting should be received by the Working Group coordinator no later than 5 p.m. two working days prior to the meeting. All public comments and materials received by the deadline become part of the official public record and will be provided to the members for their review at the meeting.

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Item No. | Recommendation
--- | ---
1. | Welcome and Introductions
2. | Public Comments and Communications
   Members of the public shall have the opportunity to address the Regional Planning Technical Working Group (TWG) and/or the Regional Energy Working Group (EWG) on any issue within the jurisdiction of SANDAG that is not on this agenda. Anyone desiring to speak shall reserve time by completing a Request to Comment form and giving it to the meeting coordinator prior to speaking. Public speakers should notify the meeting coordinator if they have a handout for distribution to TWG and EWG members. Public speakers are limited to three minutes or less per person. TWG and EWG members also may provide information and announcements under this agenda item.

Consent

3. | San Diego Regional Electric Vehicle Rebate Statistics
   The electric vehicle (EV) market in the San Diego region is rapidly growing. SANDAG has committed to provide the Regional Energy Working Group with monthly updates on regional and statewide Clean Vehicle Rebate Program (CVRP) statistics. Between June and September 2018, the CVRP received a record number of rebate applications and is still processing these applications. Once processed, the CVRP rebate statistics will be updated online. In the meantime, the San Diego County New Car Dealers Association publishes the San Diego Auto Outlook, including an update on the EV market in the San Diego region, quarterly. The 2018 third-quarter report can be found here: ncd.com/wp-content/uploads/2018/10/SD-Covering-3Q-18.pdf.

Chair’s Report

4. | Update on Regional Planning Committee Actions
   The TWG Chair will report on items discussed at the last Regional Planning Committee meeting.

Reports

5. | SANDAG Roadmap Program Update (Anna Lowe and Allison Wood)
   The SANDAG Roadmap Program has been actively supporting member agencies since 2010. Staff will present an update on the energy efficiency and climate action planning components and will share upcoming activities.
The San Diego region remains active and engaged in planning for and deployment of electric vehicles (EVs). SANDAG continues to provide resources and explore opportunities that support the adoption of EVs and reduce greenhouse gas emissions throughout the region. Two SANDAG projects will be discussed:

+6A. Plug-in San Diego
Staff will present an update on Plug-in San Diego and demonstrate the regional mapping tool, a primary deliverable of the grant-funded program.

+6B. Regional EV Charging Program
Staff will present an overview of research findings and coordination efforts to inform development of this incentive program.

7. Member Communications
TWG and EWG members are asked to provide updates on projects or efforts in their jurisdictions or organizations.

8. Upcoming Meetings
The next TWG meeting is scheduled for Thursday, December 13, 2018, at 1:15 p.m. The next EWG meeting is scheduled for Thursday, December 20, 2018, at 11:30 a.m.

9. Adjournment

+ next to an item indicates an attachment
SANDAG Roadmap Program Update

Introduction

The vision of the SANDAG Roadmap Program (Roadmap Program) is to leverage the unique role SANDAG plays as the regional planning agency to facilitate the reduction of energy use and greenhouse gas (GHG) emissions for SANDAG member agencies and in SANDAG activities through energy and climate action planning technical support, resources, and consistent approaches.

Discussion

The Roadmap Program launched in 2010 through a Local Government Partnership (Partnership) with San Diego Gas & Electric (SDG&E) for the 16 SANDAG member agencies without direct Partnerships. The primary function of the Roadmap Program was to provide member agencies with no-cost energy assessments and energy-management plans, or “Energy Roadmaps.” Each Energy Roadmap provides a framework, unique to each local government, to reduce energy use in municipal operations and in the community. In 2016, the Roadmap Program expanded to include technical assistance for climate action plan (CAP) development, monitoring, and implementation.

Energy Roadmap Implementation

Energy engineering and project-management support to achieve actual energy efficiency (EE) savings at municipal sites remains a primary program objective for the Roadmap Program. Reducing energy consumption at municipal facilities can help support local CAP goals. The no-cost energy engineering services available to Roadmap cities include energy audits of municipal facilities and EE project identification. Cities can leverage the Roadmap Program to support EE project procurement, management, and performance monitoring. The Roadmap Program has prepared feasibility studies for cities as an opportunity to help explain project concepts and highlight potential value. To date, all 16 cities have completed Energy Roadmaps and 8 cities currently are working to implement their Roadmaps. Implementation of EE projects identified in an Energy Roadmap can reduce energy consumption and costs and help support local GHG emissions reduction goals in municipal operations.

Climate Action Planning Services

Roadmap Program CAP services have been instrumental to advancing local climate action planning in the San Diego region. Services available to member agencies at no cost include data and technical resources as well as customized assistance to prepare or update CAPs. Technical resources include the Regional Climate Action Planning Framework, GHG inventory updates, and GHG-reduction measure monitoring reports. SANDAG provides consultant services to jurisdictions on various CAP components, such as GHG-reduction measure quantification, CAP document preparation, benefit–cost analysis, and implementation plan development. To date, three cities have adopted CAPs with assistance from SANDAG and another eight cities are utilizing customized CAP services to advance their CAP efforts.
**Funding**

The Roadmap Program is primarily funded through the Partnership with SDG&E through December 2020. The cities of Chula Vista and San Diego, the County of San Diego, and the Port of San Diego have their own Partnerships with SDG&E. The SANDAG Roadmap Program has been successful in bringing additional funding, including Caltrans and California Energy Commission grants, to the region to support non-energy-efficiency aspects of the Roadmap Program.

**Next Steps**

Tailored EE support will continue for those cities currently working to implement EE projects in their Energy Roadmaps. Additional cities have expressed interest in Roadmap Program EE support, and SANDAG will coordinate with them to help meet their needs. Updated greenhouse inventories and GHG-reduction measure monitoring reports will be available in early 2019 through the Roadmap Program CAP services.

Key Staff Contacts:  
Anna Lowe, (619) 595-5603, anna.lowe@sandag.org  
Allison Wood, (619) 699-1973, allison.wood@sandag.org
Joint Meeting of the Regional Planning Technical Working Group and the Regional Energy Working Group

November 8, 2018

Action Requested: Information

SANDAG Electric Vehicle Efforts Update: Plug-in San Diego

Introduction

The SANDAG Regional Energy Working Group last heard about Plug-in San Diego (Plug-in SD) at their July 26, 2018, meeting. Since that time, Plug-in SD has continued to provide Electric Vehicle (EV) Expert services, conduct outreach and education, and develop the San Diego Regional Electric Vehicle Charging Station (EVCS) Needs Assessment (Needs Assessment). The Needs Assessment comprises of an interactive mapping tool and methodology report and is one of the primary program deliverables. This report summarizes the current Plug-in SD program efforts and highlights the Needs Assessment. SANDAG staff will provide a brief demonstration of the Needs Assessment mapping tool.

Background

On January 24, 2014, the SANDAG Board of Directors accepted the San Diego Regional Plug-in Electric Vehicle Readiness Plan (Readiness Plan) as a guide for use by local governments, public agencies, and others to support plug-in electric vehicle (PEV) adoption and EVCS deployment throughout the region. In July 2015, SANDAG, in partnership with Center for Sustainable Energy (CSE), launched Plug-in SD Phase I through a two-year grant from the California Energy Commission (CEC) to implement recommendations from the Readiness Plan through a combination of resource development, training, technical assistance, and outreach. SANDAG was awarded a second grant from the CEC to continue and expand upon Plug-in SD Phase I through June 2019. In July 2017, SANDAG, in partnership with CSE, kicked off Phase II of the Plug-in SD program.

Plug-in SD Phase II

Plug-in SD Phase II continues to provide outreach and support through the CSE-supported EV Expert. The EV Expert provides no-cost general and technical assistance for local governments, employers, multifamily property managers/owners, and other stakeholders interested in electric vehicles and EVCS (Attachment 1). Through October 2018, the EV Expert has provided direct support to more than 74 inquiries, 11 of which were public agencies. Inquiries vary widely, and the EV Expert can help provide personalized assistance to all of them. In addition to the EV Expert, Plug-in SD provides electric vehicle resources and EVCS information through outreach and education in the community and to stakeholders. More information about Plug-in SD and the EV Expert is available on the program website: energycenter.org/pluginsd.

San Diego Regional EVCS Needs Assessment

In addition to the EV Expert technical support, Plug-in SD is developing the Needs Assessment. The Needs Assessment will be deployed as an interactive web-based mapping tool to help inform decision-makers about current and future EVCS needs in the San Diego region. It includes regional mapping of current EVCS infrastructure and identifies EVCS needs based on regional travel patterns identified in the SANDAG Activity Based Model and gaps in the existing network now and into the future. Additional considerations for inclusion in the Needs Assessment are disadvantaged communities and equitable distribution of infrastructure. The Needs Assessment is intended to help inform future EVCS incentive programs, climate action planning, and capital projects.
Next Steps
SANDAG is refining the Needs Assessment mapping tool and methodology report components. The Needs Assessment will be available to the public in early 2019.

Key Staff Contacts:  
Jeff Hoyos, (619) 699-1932, jeff.hoyos@sandag.org  
Anna Lowe, (619) 595-5603, anna.lowe@sandag.org  
Attachment:  
1. Plug-in San Diego Fact Sheet
Plug-in electric vehicles (PEVs) are growing in popularity in the San Diego region and their numbers are expected to rise with California’s goal of 1.5 million zero-emission vehicles on the road by 2025. With increasing PEVs comes a greater demand for residential, workplace and commercial electric vehicle charging stations (EVCS).

In support of PEV adoption, the Center for Sustainable Energy and the San Diego Association of Governments launched Plug-in SD to provide local stakeholders strategic and technical guidance to help ensure the San Diego region is PEV ready.

**Services for Target Audiences**

<table>
<thead>
<tr>
<th><strong>Local Governments</strong></th>
<th><strong>Employers</strong></th>
<th><strong>Multiunit Dwelling Residents and Building Owners</strong></th>
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</thead>
<tbody>
<tr>
<td>• Permitting and Inspection Best Practices</td>
<td>• Workplace Charging Workshops: “PEV 101”</td>
<td>• EVCS Siting Assistance</td>
</tr>
<tr>
<td>• EV Expert Consultations</td>
<td>• Incentives and Policies EV Expert Consultations</td>
<td>• Connection Cost and Fee Info</td>
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**EV Expert at Your Service**

Plug-in SD provides a technical expert who is available to assist PEV and EVCS stakeholders in person, via email or by phone. To schedule a consultation, email evexpert@energycenter.org or call (866) 967-5816.

Learn more about Plug-in SD and PEV/EVCS readiness at energycenter.org/pluginsd.
SANDAG Electric Vehicle Efforts Update: Regional Electric Vehicle Charging Program

Introduction

California currently comprises almost half of the total U.S. electric vehicle (EV) market for passenger vehicles with about 475,000 registered EVs as of October 2018. At this pace, California’s EV sales are expected to exceed 1.5 million before 2025. As of July 2018, the San Diego region has about 27,500 registered EVs. Charging infrastructure to support these vehicles is not keeping pace with expected vehicle demand: California has about 17,800 public charging station ports, and about 1,300 are located within San Diego County (stations can have multiple ports).

SANDAG is designing a regional incentive program to support public and workplace EV charging stations through a Caltrans Senate Bill 1 (Beall, 2017) planning grant. The program will help implement San Diego Forward: The Regional Plan (2015 Regional Plan) by reducing greenhouse gas (GHG) emissions associated with passenger vehicles. Staff presented an introduction to the Charging Program at each SANDAG working group earlier this year and will provide an overview of research findings and program coordination efforts to date.

Background

Zero-emission vehicles (ZEVs), like EVs and hydrogen fuel cell vehicles, are playing a major role in how countries, states, and regional and local governments plan to reduce GHG emissions, improve local air quality, and reduce petroleum dependence. In January 2018, Governor Brown issued Executive Order B-48-18 calling for 5 million ZEVs in California by 2030 along with 250,000 charging stations by 2025. The Governor also pledged an additional $2.5 billion in state funds to support these goals. Similarly, automakers are making significant investments in a wider selection of EV models. See Attachment 1 for general information on EVs and Attachment 2 for types of charging infrastructure.

To ensure the success of this relatively new vehicle market, both public and private investments are being made to deploy adequate charging infrastructure. The 2015 Regional Plan calls for SANDAG to establish and fund a regional incentive program to expand charging opportunities for EVs by supporting a regional public network of charging stations. In development of San Diego Forward: The 2019–2050 Regional Plan, SANDAG is considering ways to further expand public charging opportunities and accelerate the transition from gasoline vehicles to EVs. Additionally, multiple member agencies have adopted or are developing climate action plans (CAPs) or have sustainability goals that also contain EV-related measures.

Discussion

Research on Programs and Policies

The first phase of the grant project is to conduct a review of best practices from existing charger incentive programs and policies. Two research reports that will inform next steps in developing the SANDAG regional charger incentive program are nearing completion. The first is a Draft Summary Report on Existing Electric Vehicle Charger Incentive Programs in the United States that reviews more than 35 charger incentive programs in terms of program scope, administration, eligible technologies, participation criteria, incentive...
levels, program metrics, and additional measures. See Attachment 3 for the report introduction.
Informational interviews will be undertaken with a select number of programs to gain additional insights into program design and operation.

The second report will be a summary review of policies to guide program development. It will identify critical federal policies such as the federal vehicle emissions standards and tax credit; state policies from the California Air Resources Board, California Energy Commission, and Caltrans; regional policies, including the SANDAG Regional Energy Strategy and The Regional Plan; and local CAPs. When completed, the reports will be available for review on the SANDAG EV Charging Program website.

Project Coordination

In addition to the research efforts, coordination and outreach is ongoing with other charging programs, local governments, and other stakeholders. During this initial project phase, meetings with Caltrans District 11, the San Diego County Air Pollution Control District, most SANDAG member agencies, San Diego Gas & Electric (SDG&E), Electrify America, and the Energy Commission’s California Electric Vehicle Infrastructure Project (CALeVIP) have taken place. Wherever possible, SANDAG is seeking to coordinate and build upon regional EV efforts and outside investments.

Project Schedule

<table>
<thead>
<tr>
<th>Phase</th>
<th>Tasks</th>
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| Phase I (FY 2018–2019) | • Secure consultant and begin program development  
• Identify best practices and policy considerations  
• Coordinate with other local programs  
• Interview local stakeholders to understand participant needs |
| Phase II (FY 2019) | • Develop program criteria and eligible technologies  
• Identify base and additional incentives  
• Gain input from public and private stakeholders  
• Prepare detailed framework |
| Phase III (FY 2020) | • Build out program elements from adopted framework  
• Prepare application guidelines and reference materials  
• Determine program marketing and education elements  
• Conduct stakeholder outreach on proposed incentive program |
| Phase IV (FY 2021–2050) | • Open program (approximate budget of $1 million per year)  
• Offer incentives for public and workplace EV charging  
• Reassess program elements on a regular basis |

Next Steps

Staff will present Phase I research findings and project coordination efforts to the SANDAG Regional Planning Committee in December 2018 and Transportation Committee next quarter. Based on the research reports and stakeholder feedback, staff will develop a program framework for the Charging Program. The framework will be flexible to accommodate inclusion of future program partners and shifts in market needs and/or technologies.

Key Staff Contact: Susan Freedman, (619) 699-7387, susan.freedman@sandag.org

Attachments: 1. SANDAG InfoBits EV in the San Diego region  
2. Regional Mobility Hub Implementation Strategy – EV charging types  
3. Report excerpt: Introduction to ICF draft summary report on existing EV charger incentive programs in the U.S.
Electric Vehicles and Charging Stations

Plug-in electric vehicles (PEVs) are catching on with consumers, while at the same time playing a big role in the state of California’s plans to cut greenhouse gas emissions. With 1.5 million zero-emission vehicles expected to hit California roads by 2025, there also will be a massive demand for new charging stations.

Converting to Plug-in Electric Vehicles

PEVs come in two types...

- **battery electric** runs entirely on electricity
- **plug-in hybrids** have both an electric battery and a gas engine

There are plenty of PEV models available, and plenty of incentives to invest in them. Work is underway to deploy a network of charging stations in the region and the state.

Benefits of Driving an Electric Vehicle

- Switching to a PEV typically reduces fuel costs by half
- Reduced greenhouse gas and air pollutant emissions (zero tailpipe emissions)
- Increased energy independence (less fossil fuels, and powered by increasingly renewable electricity sources)
- Lower maintenance costs (no oil changes)

Consumer Incentives

- **Clean vehicle rebates** up to $2,500 per vehicle purchased
- **HOV lane access stickers** Solo EV drivers can use carpool lanes
- **Federal tax credits** up to $7,500
- **SDG&E EV rates** Pay lower rates for vehicle charging

Infrastructure Programs

- **Plug-in SD** SANDAG and the Center for Sustainable Energy provide guidance on the installation of charging stations.
- **SDG&E Power Your Drive Program** SDG&E will install 3,500 charging stations over the next three years.
The region and the state are poised for a rapid expansion of electric vehicle technology in the next five years. The San Diego region currently is home to about 19,000 plug-in vehicles, with that number expected to grow to more than 90,000 by 2020. Statewide, the total number of electric vehicles is expected to grow from about 170,000 to 1 million in that same time frame. There are 377 charging locations in the region (with a total of about 1,000 plug-in points) right now, and that number will grow by more than four times by 2020 (numbers do not include in-home charging). Statewide, the number of public charging plug-in points is expected to expand from 7,400 to more than 46,000 in the same time frame.

**EV Charger Locations**

- Quick charge locations
- Standard charge locations

For more information, call (619) 699-1950 or email: pio@sandag.org

**About infoBits**

SANDAG serves as the region’s clearinghouse for information and data. InfoBits publish timely, relevant information informing the public while providing context on complex issues facing the region. sandag.org

For more information, call (619) 699-1950 or email: pio@sandag.org
## ELECTRIC VEHICLE CHARGING

### DEFINITION
An electric vehicle charging station (EVCS) gives people the opportunity to charge plug-in electric vehicles (PEVs) at a mobility hub. Battery-powered electric vehicles, plug-in hybrid electric vehicles, and electric vehicle conversions of hybrid or internal combustion engine vehicles are examples of PEVs. Passenger cars, microtransit vehicles, shuttles, and large transit buses can all be PEVs. They are critical to California’s zero emission vehicle (ZEV) planning.

### SAMPLE EV CHARGING TECHNOLOGIES

The types and configuration of charging stations depend on how people use PEVs at a given location. Stations can be sited in specific areas of a transit station, or within the greater mobility hub zone. In addition to EVCS options that are available today, advanced technologies for EV charging such as wireless induction could be considered for future mobility hubs as they become available and vehicles become compatible for wireless charging.

<table>
<thead>
<tr>
<th>CHARGING TYPE</th>
<th>MILES OF RANGE PER HOUR OF CHARGE</th>
<th>MOBILITY HUB APPLICATION</th>
</tr>
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<tbody>
<tr>
<td>Level 1 (L1)</td>
<td>~3-6 miles/hour</td>
<td>• Slowest charging method&lt;br&gt;• PEVs recharging using an L1 charger, or by plugging into a standard 110/120-volt outlet&lt;br&gt;• Electric bikes, mopeds, scooters, and neighborhood electric vehicles (NEVs) recharge using a 110/120-volt outlet</td>
</tr>
<tr>
<td>Level 2 (L2)</td>
<td>3.3kW (low) 8-12 miles/hour</td>
<td>• Home, office, and public applications&lt;br&gt;• All PEVs can use Level 2 chargers&lt;br&gt;• Each charging station can have 1 to 4 ports&lt;br&gt;• Supports PEVs of parked transit riders, waiting ridehailing services, microtransit, and passing drivers who may stop at a mobility hub to charge up on their way to their ultimate destination</td>
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<td></td>
<td>6.6kW (medium) 16-24 miles/hour</td>
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<tr>
<td></td>
<td>9.6kW (high) 32-48 miles/hour</td>
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<tr>
<td></td>
<td>19.2kW (highest) &gt; 60 miles/hour</td>
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<tr>
<td>DC Fast and Super-Fast Charging (50kW to 350kW)</td>
<td>~80% of battery charged in 15-30 minutes</td>
<td>• Preferred method for corridor/freeway charging&lt;br&gt;• Quick charge for transit riders, TNCs or other microtransit, shuttles, and for passing drivers to continue trips on electric&lt;br&gt;• Not compatible with all PEVs, so typically installed along with L2 chargers&lt;br&gt;• Superfast charging was exclusive to Tesla, but it’s becoming an option for more PEVs</td>
</tr>
<tr>
<td>Wireless and future advanced charging technologies</td>
<td>TBD; Likely similar to ranges identified above</td>
<td>• Cater to new and future PEV models ranging from cars to buses&lt;br&gt;• Allow vehicles to charge without plugging in&lt;br&gt;• Older vehicle models not compatible with wireless</td>
</tr>
</tbody>
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2. Electric vehicles have battery packs in various sizes; the size determines the amount of energy stored in the vehicle and the actual time to charge.
IMPLEMENTATION CONSIDERATIONS

- Consider how electric vehicle charging at a mobility hub fits in with the overall network of public charging stations in the region.
- Statewide data show a need for more charging stations within disadvantaged communities. Consider measures that help encourage people in disadvantaged communities to buy PEVs and/or use electric carsharing services.
- When installing charging stations at mobility hubs, consider the following:
  - Add wayfinding signs to direct PEV drivers to station locations and increase awareness about public charging stations.
  - If parking is limited, assess whether charging stations can be installed at nearby properties to accommodate transit riders, TNCs, and other shuttles.
  - If electrical capacity is limited, consider installing onsite electricity storage and/or renewable sources of energy.
  - Bollards and/or curbs can protect charging equipment from collisions.
  - Determine the distance between planned charging stations and electrical connections. Where possible, site charging stations near the electrical substations.
  - Provide a dedicated electric meter for charging stations at a hub.
  - Provide a network connection to track overall usage and show real-time availability at each station through phone apps and other networks.
  - Install stations with multiple ports between stalls, to increase access to charging equipment from multiple stalls. Do this where physical configuration, vendor technologies, accessibility requirements, and other design constraints allow.
- Consider how charging stations will be managed, operated, monitored, and maintained. Local agencies or jurisdictions that partner with vendors to provide stations may pay a fee to the vendor to install, manage, operate, and maintain it.
- A variety of smartphone applications and websites provide information on how to locate charging stations. This could be integrated with other trip planning websites, applications, and kiosks to encourage EV charging at mobility hubs.
- Universal transportation accounts could be expanded to allow users to pay for charging fees.
- Funding opportunities are available to support the purchase of charging stations for some types of installations and each program has its own eligibility requirement:
  - The San Diego Gas & Electric program, Power Your Drive, provides charging stations for workplaces and multi-family dwellings, if they meet certain qualifications. SDG&E aims to deploy up to 3,500 charging stations in its service territory, and the utility will pilot a project that will feature chargers at eight park-and-ride stations in the San Diego region.
  - Electrify America will invest $800 million in California for EV charging over the next ten years, and a San Diego Metro Area program will be a beneficiary. Funding comes from a $1.2 billion federal settlement with Volkswagen over emission violations.
  - SANDAG is developing a regional charging program to offer incentives to agencies and businesses for the purchase and installation of publicly accessible charging stations. The program is expected to be available in 2021.

RESOURCES

- **State policies and resources** that support the increased deployment of EVCSs include:
  - Executive Order B-16-12 calls for 1 million ZEVs by 2020 and 1.5 million by 2025, including required infrastructure to support these vehicles. Senate Bill 1275 (2014) extended the 2020 ZEV deadline to 2023.
  - The California Energy Commission Alternative and Renewable Fuel and Vehicle Technology Program provides grants to support vehicle deployments; regional EVCS planning; and research, development, and demonstration of emerging technologies.
  - The 2016 California Building Standards Code includes EVCS requirements that apply to new construction and to alterations of existing structures.
  - The California Green Building Standards Code (CALGreen), includes information on voluntary and mandatory requirements for EV charging stations.
  - The California Electrical Code (Title 24, Part 3, Article 625) specifies required methods for wiring, equipment construction, and safety (shock) protection systems and overcurrent control and protection. It also covers proper equipment marking, placement, orientation, and location.
- **Regional and local policies and resources** that support the increased deployment of EVCSs include:
  - San Diego Forward: The Regional Plan and its Environmental Impact Report identify several measures supporting the electrification of transportation. Among them:
    - Prepare a regional alternative fuels readiness plan.
    - Develop a regional charger incentive program.
    - Integrate EV charging infrastructure into new transportation projects that include parking lots and/or facilities.
    - A review of codes and standards relating to EVCS installations
    - An overview of common installation challenges in different scenarios
    - EVSC installation checklists and other best practices to help local building departments and electrical contractor
Del Lago Transit Station – Escondido, CA
Located off Interstate 15, the Del Lago Transit Station provides access to five Level 2 chargers and a DC Fast Charger with two ports. The Level 2 chargers are compatible with all PEVs and provide a full charge in four to six hours. The DC Fast Charger works well for users who need a quick charge before continuing their trip. Only electric vehicles are permitted to park in these charging spots.

Sabre Springs/Peñasquitos Transit Station – San Diego, CA
Located off the intersection of Interstate 15 and Ted Williams Parkway, this station provides access to ten Level 2 chargers and is pre-plumbed for 20 more. The chargers are compatible with all PEVs and provide a full charge in four to six hours. Only electric vehicles are permitted to park in these charging spots. This transit station incorporated other mobility hub features including smart parking, bike lockers, and solar shading for rooftop parking.

Metro Charge Stations – Los Angeles County
Metro has installed 62 EV charge stations at 15 rail station parking lots throughout Los Angeles County. The charge stations allow users to charge their vehicles while they ride Metro. Charge stations are available for $1 per hour with a $3 daily max to riders who sign up for an account through Metro’s website. There is no monthly or start-up fee. An app-based system is used to initiate a charge, and a user can receive an email, text, or a mobile app notification when the charging session is completed or if it’s experienced any interruptions.

EVCS Portals
The U.S. Department of Energy’s Alternative Fuel Data Center station locator provides information on alternative fueling station locations and features, and the infrastructure is verified by the Clean Cities Coalition. PlugShare and ChargeHub are crowd-sourced tools that allow users to find electric vehicle charging stations. These resources are available online or via a mobile app.
Report Excerpt – Introduction

Draft Summary Report on Existing EV Charger Incentive Programs in the US

Incentive programs are available for the installation of electric vehicle (EV) charging stations from a variety sources for a variety of levels of funding. This document focuses on government-funded programs and select California utility programs. Incentives can be rebates or competitively awarded, as well as tax credits or low-interest loans. Research for this report is based on the U.S. Department of Energy’s Alternative Fuels Data Center (AFDC) Laws and Incentives database, incentive program websites, program applications and guidance documents, and state legislation. All information presented here is publicly available; when data or program details were not listed online, they are marked as “not available”. Further information, such as program metrics, program development methodology, and outreach strategies can be obtained through interviews with program administrators. See Table 1 for summaries of EV charging station incentive programs, with information included for Level 2 (L2) and Direct Current Fast Charging (DCFC) stations. A synopsis on existing EV charger incentive programs follows this Table.

Table 1. EV Charging Station Incentives Summary

<table>
<thead>
<tr>
<th>State</th>
<th>Type of Incentive</th>
<th>Level of Charging</th>
<th>Incentive</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>California – Anaheim Public Utilities</td>
<td>Reserved Rebate</td>
<td>L2, DCFC</td>
<td>• $5,000 per L2 or DCFC station</td>
<td>Lottery process</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• $10,000 per station at school, MUD serving income qualified customers, or is a public DCFC</td>
<td></td>
</tr>
<tr>
<td>California – Bay Area Air Quality Management District</td>
<td>Grant</td>
<td>L2, DCFC</td>
<td>• $1,500-3,000 L2</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• $18,000 DCFC.</td>
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<td></td>
<td></td>
<td></td>
<td>• $1,000 per extra L2 port.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Additional funding for co-located solar</td>
<td></td>
</tr>
<tr>
<td>California – Burbank Water and Power</td>
<td>Rebate</td>
<td>L2</td>
<td>• $500 for residential;</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• $1,000 for commercial single users,</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>• $2,000 for commercial with multiple users</td>
<td></td>
</tr>
<tr>
<td>California – CEC CALeVIP for Fresno County</td>
<td>Reserved rebate</td>
<td>L2</td>
<td>• $4,000 single port, $7,000 dual port</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td>California – Glendale Water and Power</td>
<td>Rebate</td>
<td>L2</td>
<td>• $500 for residential;</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• $2,000 for MUD or commercial</td>
<td></td>
</tr>
<tr>
<td>California –</td>
<td>Rebate</td>
<td>L2</td>
<td>• $500 for residential</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>Type of Incentive</td>
<td>Level of Charging</td>
<td>Incentive</td>
<td>Distribution</td>
</tr>
<tr>
<td>-------------------------------------------</td>
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</tr>
<tr>
<td>Los Angeles Department of Water and Power</td>
<td></td>
<td></td>
<td>• $3,500 - $5,000 for public, MUD or workplace - higher with dedicated meter.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• $750 per additional port</td>
<td></td>
</tr>
<tr>
<td>California – Marin County</td>
<td>Grant</td>
<td>L2</td>
<td>• $3,000 per charger</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td>California – Pacific Gas &amp; Electric</td>
<td>Reserved Rebate option</td>
<td>L2</td>
<td>• Utility pays for electrical infrastructure construction</td>
<td>Not available</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• $1,150 per port for MUDs ($2,300 for disadvantaged communities)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• $575 per port for workplaces ($1,150 for disadvantaged communities)</td>
<td></td>
</tr>
<tr>
<td>California – Pasadena Water and Power</td>
<td>Rebate</td>
<td>L1, L2, DCFC</td>
<td>• Commercial, workplace, MUD, and fleet: $1,500 non-networked or $3,000 for networked L2</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Public L2, DCFC, L2 at schools, income-qualified homes, and disadvantaged communities: $6,000</td>
<td></td>
</tr>
<tr>
<td>California – Sacramento Municipal Utility District</td>
<td>Rebate/Grant</td>
<td>L2, DCFC</td>
<td>• Free charging station for residents</td>
<td>L2 is first-come, first-served; DCFC is awarded</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• $1,500 for workplace and MUD L2</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• $120,000 per DCFC project</td>
<td></td>
</tr>
<tr>
<td>California – San Diego Gas and Electric</td>
<td>Other</td>
<td>L2</td>
<td>• Utility pays for electrical infrastructure construction</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Utility owns and installs chargers.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Site hosts pay a one-time fee of $235 per port unless in DAC.</td>
<td></td>
</tr>
<tr>
<td>California – San Joaquin Valley Air Pollution Control District</td>
<td>Voucher</td>
<td>L2, DCFC</td>
<td>• $5,000 single L2; $6,000 dual port L2; 70% up to $25,000 for DCFC</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td>California – Santa Barbara County</td>
<td>Grant</td>
<td>L2, DCFC</td>
<td>• Public entities/ non-profits: $10,000 for L2, $20,000 for DCFC</td>
<td>Awarded</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Private entities: $7,500 for L2, $15,000 for DCFC</td>
<td></td>
</tr>
<tr>
<td>California – South Coast Air Quality</td>
<td>Rebate</td>
<td>L2</td>
<td>• $250; additional $250 for low income</td>
<td>First-come, first-served</td>
</tr>
</tbody>
</table>
### Summary Report on Existing EV Charger Incentive Programs in the US

<table>
<thead>
<tr>
<th>State</th>
<th>Type of Incentive</th>
<th>Level of Charging</th>
<th>Incentive</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management District</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>California – CEC CALeVIP for Southern California</td>
<td>Reserved Rebate</td>
<td>DCFC</td>
<td>• 75% up to $70,000; 80% up to $80,000 for disadvantaged communities</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td>California – Southern California Edison</td>
<td>Reserved Rebate</td>
<td>L1, L2</td>
<td>• Utility pays for electrical infrastructure construction • Rebate for L1 and L2 varies: disadvantaged communities receive 100%, MUDs 50%, and others 25%</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td>California – Statewide</td>
<td>Loan</td>
<td>L2, DCFC</td>
<td>Loan loss reserve, 48-month pay off</td>
<td>N/A</td>
</tr>
</tbody>
</table>

#### Other States

<table>
<thead>
<tr>
<th>State</th>
<th>Type of Incentive</th>
<th>Level of Charging</th>
<th>Incentive</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado</td>
<td>Grant</td>
<td>L2, DCFC</td>
<td>• $9,000 for dual L2; $30,000 for multi-port DCFC</td>
<td>Awarded</td>
</tr>
<tr>
<td>Connecticut</td>
<td>Grant</td>
<td>Unknown</td>
<td>• 50% up to $2,000 per unit and $4,000 per site</td>
<td>Awarded</td>
</tr>
<tr>
<td>Connecticut</td>
<td>Loan</td>
<td>L1, L2, DCFC</td>
<td>• Loan, 4.49% interest rate</td>
<td>N/A</td>
</tr>
<tr>
<td>Delaware</td>
<td>Rebate</td>
<td>L2</td>
<td>• 50% up to $500 for residential; 75% up to $2,500 for public; 75% up to $5,000 workplace</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td>District of Columbia</td>
<td>Tax credit</td>
<td>Unknown</td>
<td>• 50% of equipment and installation costs up to $1,000 for residential; 50% up to $10,000 for public</td>
<td>N/A</td>
</tr>
<tr>
<td>Florida – Sarasota County</td>
<td>Reserved rebate</td>
<td>L2, DCFC</td>
<td>• 25% of equipment and installation costs up to $2,500 for businesses; 50% up to $4,000 for non-profits and government</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td>Georgia</td>
<td>Tax credit</td>
<td>L2</td>
<td>• 10% of equipment and installation costs up to $25,000</td>
<td>N/A</td>
</tr>
<tr>
<td>Idaho/Wyoming</td>
<td>Rebate</td>
<td>L2</td>
<td>• $5,000 per charger</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td>Louisiana</td>
<td>Tax credit</td>
<td>Unknown</td>
<td>• 30% of equipment costs</td>
<td>N/A</td>
</tr>
<tr>
<td>Maryland</td>
<td>Rebate</td>
<td>L1, L2, AC L3</td>
<td>• 40% up to $700 for residential; 40% up to $4,000</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td>State</td>
<td>Type of Incentive</td>
<td>Level of Charging</td>
<td>Incentive</td>
<td>Distribution</td>
</tr>
<tr>
<td>------------</td>
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<td>-------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Maryland</td>
<td>Grant</td>
<td>DCFC</td>
<td>50% up to $55,000</td>
<td>Awarded</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>Grant</td>
<td>Dual port L2</td>
<td>Dependent on the number of EVs in the fleet: $5,000 for 1-2 EVs; $7,500 for 3-4 EVs, $10,000 for 5+ EVs</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>Grant</td>
<td>L1, L2</td>
<td>50% up to $25,000 per location</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>Grant</td>
<td>Full corridors of DCFC</td>
<td>80% up to $170,000 per 150-kilowatt (kW) station and $70,000 per 50kW</td>
<td>Awarded</td>
</tr>
<tr>
<td>Nebraska</td>
<td>Loan</td>
<td>Unknown</td>
<td>Interest rate of 5% or lower</td>
<td>N/A</td>
</tr>
<tr>
<td>New Jersey</td>
<td>Grant</td>
<td>L1, L2</td>
<td>$750 for L1; $5,000 for single port L2; $6,000 for dual port L2</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td>New York</td>
<td>Rebate</td>
<td>L2, DCFC</td>
<td>$8,000 per L2 port; $32,000 per DCFC. Up to $250,000 per facility</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td>New York</td>
<td>Tax credit</td>
<td>Unknown</td>
<td>50% of equipment and installation costs, up to $5,000</td>
<td>N/A</td>
</tr>
<tr>
<td>Ohio</td>
<td>Loan</td>
<td>Unknown</td>
<td>Low-interest loans for 75% of costs</td>
<td>N/A</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>Tax credit</td>
<td>Unknown</td>
<td>75% of equipment and installation costs</td>
<td>N/A</td>
</tr>
<tr>
<td>Oregon</td>
<td>Loan</td>
<td>Unknown</td>
<td>Low-interest loan</td>
<td>N/A</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>Rebate/Grant</td>
<td>L2, DCFC</td>
<td>Rebates for L2, grants for DCFC. No additional information</td>
<td>First-come first served for L2; awarded for DCFC</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>Reserved rebate</td>
<td>L2, DCFC</td>
<td>$15,000 per station, capped at $60,000</td>
<td>First-come, first-served</td>
</tr>
<tr>
<td>Texas</td>
<td>Grants</td>
<td>Unknown</td>
<td>50% of equipment and installation costs, up to $600,000</td>
<td>Awarded</td>
</tr>
<tr>
<td>Utah</td>
<td>Grants</td>
<td>Unknown</td>
<td>100% of equipment costs</td>
<td>Unknown</td>
</tr>
<tr>
<td>Washington</td>
<td>Grant</td>
<td>DCFC and co-located L2</td>
<td>Based on request</td>
<td>Awarded</td>
</tr>
</tbody>
</table>
While each funding program is unique, there were common components across programs:

**General Program Information.** Program geography is based on the authority of the program administrator; in most cases, programs are for the whole state. Notable exceptions are the California programs, the Sarasota County Florida program, and programs that fund specific charging corridors.

**Program oversight and administration.** Most of the incentive programs are run on a state-wide basis by a state agency. Some regional programs in California are run by Air Quality Districts or the California Energy Commission. Utilities also offer incentives for charging station installations; this document provides information about select California utility programs.

Several California programs were mentioned in their associated Regional Transportation Plans (RTPs). While some RTPs stated support for the programs or signaled that they would contribute funding to the programs once other funding sources are exhausted, it does not appear that any of the programs were specifically formed because of an RTP.

**Eligible charging technologies and associated incentive amounts.** Most programs funded Level 2 or DCFC stations. Level 2 funding varies from 10% of station costs to 100% of costs, capped at between $2,000 and $15,000 per station (for public stations). Some states require that applicants be approved before beginning construction in order to reserve rebate funds (noted in Table 1 as “reserved rebates”). Grants are typically provided for larger projects, such as DCFC installations. None of the programs explicitly allow funding for charging for neighborhood EVs, electric bikes, or electric scooters. Some, particularly grants, provide operations and maintenance funding (including funding for networking fees).

**Program participation requirements.** Eligible entities vary by program and the mission of each program (e.g., public stations, fleet stations, workplace charging stations). There is a split on whether stations are required to be networked or not, and some programs, particularly those developed more recently, require that stations follow open communication protocol standards. The CALeVIP programs (see below) require stations to be EnergyStar® certified.

Programs usually require DCFC stations to have both CHAdeMO and SAE CCS connectors. Most programs require DCFC to be able to provide 50 kilowatts (kW) of energy, but many of the incentive programs encourage them to be “future-proofed” and wire the site to be able to provide up to 150 kW.

The California South Coast program offers additional funds for low-income residents to install residential charging stations. Minnesota’s funding for DCFC corridors awards extra points to veteran-owned and economically disadvantaged businesses in the grant process, but the charging stations are not necessarily placed in disadvantaged communities (DACs).

**Allocation and/or distribution of program funds.** Most programs distribute rebates and grants on a first-come, first-served basis. Restrictions on the number of rebates per applicant vary from program to program, but some restrict based on a cap per location rather than per applicant (e.g., an employer may request a limited amount of money per workplace but can apply for each office located in the state).

The Massachusetts workplace charging program appears to allocate funds by geographic areas. Some programs, particularly in California, reserved a percentage of funds specifically for disadvantaged or low-income communities. Others either gave priority to DACs or provided them with more funding than projects outside of DACs.
Performance metrics and data monitoring methods. Only a few programs provide program impact data. The Bay Area, San Joaquin Valley, Santa Barbara, Southern California Edison, Massachusetts, Texas, Utah, and Washington provide information about the amount of funds distributed and the number of charging stations installed. Maryland provides information about the amount of funds distributed, number of charging stations installed, and estimated annual number of gallons of petroleum displaced.

Stakeholder outreach methods. The San Joaquin Valley and Southern California Edison programs include information online about their outreach strategy, and ICF provided information about Maryland’s outreach strategy based on previous conversations with the program administrator. No other program has outreach strategy information available online; this information will be obtained through interviews with the program administrators. Most California programs have multilingual websites.

State and/or federal agency involvement. The Fresno and Southern California programs are a result of the California Electric Vehicle Infrastructure Project (CALeVIP), a California Energy Commission (CEC) program for regional EV infrastructure programs that aims to support the state’s goals to improve air quality, fight climate change, and reduce petroleum use. CALeVIP is funded through the CEC Alternative and Renewable Fuel and Vehicle Technology Program, which supports innovations in transportation and fuel technologies. As of September 2018, CALeVIP is funded for more than $39 million, with the potential of up to $200 million. South Coast program uses AB 2766 funds, administered through the Mobile Source Air Pollution Reduction Review Committee (MSRC). The San Joaquin Valley program does not specify the funding source, but the San Joaquin Valley Air Pollution Control District (SJVAPCD) receives most of its funding from stationary and mobile source permit fees (63%), with the rest provided by vehicle registration funds (24%) and state (California Air Resources Board, CARB) and federal (U.S. Environmental Protection Agency, EPA) grants (13%).

As most of the programs are run by state agencies, funding recipients that are required to report data report directly to those same state agencies. Most programs do not have federal involvement, apart from Colorado receiving funding from the Congestion Mitigation and Air Quality Program (CMAQ) and a few programs being funded by the Volkswagen Environmental Mitigation Trust.

Additional considerations. None of the programs publicly provide information about how they were developed or the data that informs the program direction.