SAN DIEGO REGIONAL ELECTRIC VEHICLE INFRASTRUCTURE WORKING GROUP

MEETING NOTICE AND AGENDA

Date: **Thursday, March 21, 2013**

Time: **1:00 p.m. to 2:30 p.m.**

Location: **San Diego Gas & Electric Energy Innovation Center**
4760 Clairemont Mesa Blvd.
San Diego, CA 92117

Staff Contact: **Tyler Petersen**
Tel: (858) 244-4876
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AGENDA HIGHLIGHTS

- **RESIDENTIAL PERMIT AND INSPECTION TEMPLATE**
- **REQUEST FOR EVSE PROPOSALS TEMPLATE**
- **REGIONAL PEV READINESS PLAN DEVELOPMENT**

In compliance with the Americans with Disabilities Act (ADA), CCSE will accommodate persons who require assistance in order to participate in San Diego REVI meetings. If such assistance is required, please contact CCSE at (858) 244-1177 at least 72 hours in advance of the meeting.

SANDAG

Center for Sustainable Energy CALIFORNIA

SAN DIEGO REGIONAL CLEAN CITIES COALITION

SAN DIEGO REVI

Thursday, March 21, 2013

ITEM # **RECOMMENDATION**

1. WELCOME AND INTRODUCTIONS

+2. SUMMARY OF THE FEBRUARY 21, 2013 MEETING **APPROVE**

The San Diego Regional Electric Vehicle Infrastructure Working Group (REVI) is asked to review and approve the February 21, 2013 meeting summary.

3. ANNOUNCEMENTS AND PUBLIC COMMENTS

Members of the public shall have the opportunity to address San Diego REVI on any plug-in electric vehicle (PEV) issue that is not on this agenda. Public speakers are limited to three minutes or less per person. REVI members may provide information and announcements under this item.

CONSENT ITEM

+4. REGIONAL PEV ACTIVITIES SINCE LAST REVI MEETING **INFORMATION**

The updated REVI barriers table is attached.

REPORT ITEMS

+5. RESIDENTIAL EVSE PERMIT AND INSPECTION TEMPLATE **ACCEPT**

At the last meeting, REVI members provided further comments on the guidance document for residential EVSE permitting and inspection. This document is to serve as a template that jurisdictions can modify to their agency-specific needs. REVI is asked to provide any final suggestions and to accept this document. It will then be finalized and distributed to local jurisdictions in the San Diego region. Additional resources to assist staff, homeowners and/or contractors are attached.

+6. REQUEST FOR EVSE PROPOSALS TEMPLATE **ACCEPT**

The Request for Proposals (RFP) template has been further refined for use and modification by public agencies interested in EVSE. REVI members are asked to provide any final suggestions and to accept this document, which will then be distributed to public agencies in the San Diego region. Sample evaluation criteria to score RFPs are attached.

+7. REGIONAL PEV READINESS PLAN DEVELOPMENT **DISCUSSION**

Results from the initial planning and siting efforts for publicly accessible EVSE will be presented to inform the REVI's discussion of continued near- and long-term regional planning needs. Both topics below deal with local barriers experienced during the initial roll out of plug-in electric vehicles.

A. Barrier 7: Regional Planning for Public EVSE Siting
Through the EV Project, regional modeling to identify optimal locations to site publicly available EVSE was undertaken in 2009-2010. Several REVI members participated in the EV Project's Stakeholder Advisory Committee and provided direction on a land use suitability model. SANDAG will present an overview of this process. The REVI is asked to discuss the regional planning approaches taken thus far and what method(s) should be utilized moving forward. These discussions will serve as a basis for developing a fact sheet on regional planning for public EVSE.

B. Barrier 10: Commercial and Workplace Charging
CCSE analysts have developed a discussion paper on the value proposition for being an EVSE host site. Survey data from EVSE hosts in the San Diego region was used to evaluate costs of hosting Level 2 EVSE, user fees, PEV owners' willingness to pay for those fees, and non-revenue benefits. CCSE will present the key findings of this paper. REVI members are asked to discuss how this information can be used to address barriers related to commercial and workplace charging in the region.

8. MATTERS FROM MEMBERS **INFORMATION**

REVI members are encouraged to discuss additional topics of general interest.

9. NEXT MEETING **INFORMATION**

The next REVI meeting is scheduled for Thursday, April 18, 2012, at the SDG&E Energy Innovation Center 4760 Clairemont Mesa Blvd., San Diego, CA 92117.

10. ADJOURNMENT

+ next to an item indicates an attachment

February 21, 2013 MEETING SUMMARY

ITEM #1: WELCOME AND INTRODUCTIONS

Chair Susan Freedman, San Diego Association of Governments (SANDAG), called the meeting to order at 1:06 p.m. and welcomed everyone to the San Diego Regional Electric Vehicle Infrastructure Working Group (REVI). Ms. Freedman introduced Tyler Petersen, California Center for Sustainable Energy (CCSE). Mr. Petersen has replaced David Almeida as the CCSE project lead for staffing the REVI group.

ITEM #2: SUMMARY OF THE JANUARY 17, 2013 MEETING

Joel Pointon, San Diego Gas and Electric (SDG&E), motioned to approve the meeting summary from January 17, 2013. Micah Mitrosky, IBEW Local 569, seconded the motion. Motion carried without opposition.

ITEM #3: ANNOUNCEMENTS AND PUBLIC COMMENTS

Mr. Pointon made three announcements:

1. There is an EV Project update meeting on March 6, 2013
2. The U.S. Department of Energy Plug-in Electric Vehicle (PEV) readiness scorecard is now available at https://www.afdc.energy.gov/pev-readiness
3. The federal tax credit for Electric Vehicle Supply Equipment (EVSE) installations has been extended and is retroactive to 2012
    a. This tax credit allows business and consumers to claim up to 30% of the cost of hardware and installation. Businesses are capped at $30,000 per property and individuals are capped at $1,000.

Molly Ash, Cuyamaca College, announced that Cuyamaca College has received funding to host the Electric Vehicle Infrastructure Training Program (EVITP). Ms. Ash, the Continuing Education and Workforce Training Program Manager at Cuyamaca College, would like to promote the EVITP training to a wider audience and requested that her contact information be sent to the REVI group. SANDAG and CCSE agreed to distribute her information to the group.

ITEM #4: REGIONAL PEV READINESS PLAN DEVELOPMENT

A. Barrier 7: Regional Planning for Public EVSE Siting AND
Barrier 9: Public Agency EVSE Installation

During the January 17, 2013 meeting, REVI members agreed that an outline RFP for public agencies to install and operate electric vehicle charging infrastructure would be beneficial. Mr. Petersen directed the group to the draft Request for Proposal (RFP) Outline which provides recommended headings and proposal language to assist in the issuance of an RFP for Electric Vehicle Charging Stations. Mr. Petersen announced that this outline leveraged information from similar RFP's completed by the City of Chula Vista and the City of Long Beach.

Brendan Reed, City of Chula Vista, updated the group on the City's EVSE RFP and installation. He commented that the RFP was distributed to 12 Electric Vehicle Service Provider (EVSP) companies, which were previously identified by the County of Los Angeles as qualified EVSP companies. ECOtality was the selected vendor and received a five-year contract which includes the installation and maintenance of 33 public EVSE at five different locations.

REVI members from local governments provided the following feedback on the draft RFP Outline:

- Mr. Reed highlighted the importance of including language regarding public liability and insurance requirements as these items caused delays for the City of Chula Vista. Since each agency has liability language for any agreement, Mr. Reed recommends that this information be included to provide transparency and prevent project delays. Mr. Reed also recommended including contract language that explicitly states the conditions for the removal of the EVSE, change of ownership, and contract renewal.
- Jacques Chirazi, City of San Diego, suggested that the language regarding sub-meters should be altered because EVSE installations should be connected to the transformer and sub-meters should not be used. Mr. Pointon agreed and commented that the term "sub-meter" be removed entirely because commercial customers are unable to install a sub-meter and instead use the term "metering configuration".
- Mr. Reed commented that one EVSE site in Chula Vista will have a private meter measuring electricity usage, and offered that he could share the utilization data with the group.
- Mike Grim, City of Carlsbad, commented that some cities could need assistance in identifying site locations, and encouraged this information to be included in the *Overview of the Project* section of the outline.
- Kathy Valverde, City of Santee, added that it is useful to include more detailed information in the outline, and then allow each agency to determine which parts to omit based their conditions.

Mr. Petersen asked non-municipal members for their input on the document. Karen Prescott, National Electrical Contractors Association, emphasized the importance of identifying the need for properly trained electricians. Jill Brandt, eVgo, added that her company will only work with local, properly trained electricians. Mr. Reed commented that requiring licensure information, EVSE installation training and a record of past installations would have been beneficial to include in Chula Vista's RFP. Tim Dudek, Saturn Electric, commented that only qualified contractors that hold an A, B or C-10 license should be selected to do this type of work.

Mr. Petersen directed the group to the *Proposal Evaluation & Award Process* section and inquired about the rate structure and method of payment language. It was clarified that this section of the RFP is referring to the agencies payment collection from the vendor and does not reference the customer's payment options. Mr. Reed encouraged including language regarding the payment options from the customer point of view.

Ms. Valverde highlighted the importance of advertising requirements. Ms. Valverde added that in the *Proposal Evaluation & Award Process* section, the "proposers marketing strategy" language is too general. Ms. Valverde commented that the marketing of these projects is a benefit to the agency, and three to five main points on this topic should be included.

Mr. Petersen announced that the City of Fresno cannot host turn-key model charging on their facilities because all public buildings in Fresno are funded through public bonds, and this model would jeopardize the City's tax exempt status on these buildings. Mr. Chirazi stated that this would not be an issue for the City of San Diego. Ms. Mitrosky added that it would be beneficial to include an advisory note regarding prevailing wage.

Ms. Freedman requested that the group send any further comments regarding this outline to her and Mr. Petersen by 2/28/2013.

B. Barrier 1: Permitting and Inspection

Mr. Petersen directed the group to the *Electric Vehicle Charging Station Permitting and Installation Guideline*. This document was reviewed at the January 17, 2013 meeting where a few edits were requested. These updates have been made and Mr. Petersen asked the group was willing accept this document.

Mr. Reed stated that the title is confusing and requested that it be updated. Ms. Mitrosky agreed and commented that information in the document is directed towards two audiences: the customer and the EVSE installer. The group agreed and requested that the document be updated to clearly separate information for the customer versus the information directed towards the EVSE installer. The document will be updated and presented to the group for review at the March meeting.

ITEM #5: PRIORITIZATION OF REVI BARRIERS

Ms. Freedman directed the group to the *Progress on Regional PEV Barriers* table. Per the request of the group, the barriers list has been updated to include a priority barometer. This update creates an easy way to identify the high priority barriers with a quick glance. Additionally, a column has been created for members to be able to easily identify group action items.

Ms. Freedman continued to the *Prioritization of San Diego REVI Barriers* flow chart. This flow chart was created to provide a visual tool of the barriers. The flow chart identifies three main barriers (Regional Planning for Public EVSE siting, Permitting Issues, and Utility PEV Solutions) and then flows into the other identified barriers. She explained that the idea behind this chart is to show the correlation between all the barriers and how addressing one can help towards resolving another.

Ms. Freedman requested that the group send any comments regarding this flow chart to her by 2/28/2013.

ITEM #6: EVGO PRESENTATION

Jill Brandt, eVgo, presented to the group on the upcoming infrastructure projects in San Diego. Through a California Public Utilities Commission settlement, NRG Energy and its subsidiary, eVgo, will invest roughly $150 million to install hundreds of DC fast chaging sites and thousands of individual eVgo Level 2 charging stations at homes, offices, multi-family communities and public locations throughout the State. eVgo is beginning their California deployment in the San Diego market.

eVgo has a trademarked DC fast charging system called the “Freedom Station”. Freedom Stations are public DC fast charging systems with a combined Level 2 charger. The Freedom Station locations are selected based on the following criteria:

1. Easy access to freeway
2. High visibility
3. Security assessment
4. Retail engagement

A minimum of 200 Freedom Stations will be installed in California, with 15 to 20 prospective sites in the San Diego region. Consumers using the eVgo system will be required to either use a pay-as-you-go model or sign up for a user subscription option.

Prospective hosts at multi-family units or workplaces will be required to provide dedicated parking spots for the EVSE. As part of the settlement, eVgo will provide for hosts: the installation and design, permitting services, hardware, construction services, station maintenance, electrical power, customer support, and comprehensive co-marketing for each site.

The installations will occur on a first-come-first-serve basis. Additional information for eVgo installations are available at: https://www.evgonetwork.com/request-charging-station/

ITEM #7: REGIONAL PEV ACTIVITIES SINCE LAST REVI MEETING

Mr. Petersen notified the group that the PEV readiness regional update is included in the agenda.

ITEM #8: NEXT MEETING

Mr. Petersen announced that the next meeting is scheduled for Thursday, March 21, 2013 at the SDG&E Energy Innovation Center.

ITEM #9: MATTERS FROM MEMBERS

Randy Shimka, SDG&E, stated that he did not receive the agenda email that was sent out last week. Staff will address this issue and advised that future emails may be sent via Outlook.

Mr. Pointon announced that SDG&E will attend the March 6, 2013 ECOtality update meeting, and will provide a summary for members during the March REVI meeting.

ITEM #10: ADJOURMENT

The meeting was adjourned at 2:38 p.m.

REVI Voting Member Attendance February 21, 2013

REPRESENTATION		NAME	MEMBER / ALTERNATE	ATTENDING
South County Subregion	City of Chula Vista	Brendan Reed	Member	YES
	City of Imperial Beach	Chris Helmer	Alternate	NO
North County Coastal Subregion	City of Del Mar	Ramsey Helson	Member	NO
	City of Carlsbad	Mike Grim	Alternate	YES
North County Inland Subregion	City of Escondido	Kathy Winn	Member	NO
	Vacant	Vacant	Alternate	-
East County Subregion	City of Santee	Kathy Valverde	Member	YES
	City of La Mesa	Scott Munzenmaier	Alternate	NO
City of San Diego		Jacques Chirazi	Member	YES
		Vacant	Alternate	-
County of San Diego		Peter Livingston	Member	NO
		Vacant	Alternate	-
San Diego Association of Governments		Susan Freedman, Chair	Member	YES
		Allison King	Alternate	YES
San Diego Regional Airport Authority		Paul Manasjan	Member	NO
		Brett Caldwell	Alternate	NO
Caltans, District 11		Chris Schmidt	Member	NO
		Vacant	Alternate	-
Unified Port District of San Diego		Michelle White	Member	NO
		Jenny Lybeck	Alternate	YES
San Diego Gas & Electric		Joel Pointon	Member	YES
		Randy Shimka	Alternate	YES
California Center for Sustainable Energy		Mike Ferry, Vice Chair	Member	NO
		Colin Santulli	Alternate	NO
University of California, San Diego		Dave Weil	Member	YES
		Jim Ruby	Alternate	NO
Miramar College, Advanced Transportation Technology and Energy Program		Greg Newhouse	Member	NO
		Vacant	Alternate	-
San Diego Electric Vehicle Network		Randy Walsh	Member	NO
		Vacant	Alternate	-
National Electrical Contractors Association		Karen Prescott	Member	YES
		Tim Dudek	Alternate	YES
International Brotherhood of Electrical Workers Local 569		Micah Mitrosky	Member	YES
		Vacant	Alternate	NO

Others in Attendance

Molly Ash, Continuing Education and Workforce Training, Cuyamaca College
Jill Brandt, eVgo
Dan Chappell, Private Developer
Nick Cormier, San Diego Air Pollution Control District
Jamie Edmonds, EV Owner, Firefighter
Justin Ker, Car2Go
David Powell, U.S. Navy
Anna Lowe, SANDAG
Tyler Petersen, CCSE
Jessica Thoma, CCSE
Randy Wilde, CCSE

Progress on Regional PEV Barriers

Barriers/Solutions Being Addressed by Statewide Department of Energy PEV Project and REVI

Priority: High Medium Low

Barrier	Progress on Solutions – Preparation of Guidance Materials	Action Items
1. Permitting/Inspection Lack of streamlined permitting and inspection processes and inconsistent (high) costs across jurisdictions.	• Discussed by REVI at 5/17/12 meeting. • Discussed locally at PEV Workshop at CCSE on 6/14/12. • REVI provided feedback on barrier assessment on 11/8/12, CCSE incorporated feedback into revised DOE PEV Readiness Assessment. • Permitting and inspection guideline presented to REVI members at 1/17/13 and 2/21/2013 meetings where REVI members provided feedback on the document.	• SANDAG and CCSE to make the requested edits to the permitting and inspection guideline. Edits to be reviewed by members during the 3/21/13 meeting.
2. Building Codes Lack of standard building codes that accommodate charging infrastructure or dedicate circuits for charging infrastructure in new construction and major renovations.	• Discussed by REVI at 5/17/12 meeting. • Discussed locally at PEV Workshop at CCSE on 6/14/12. • REVI provided feedback on barrier assessment on 11/8/12, CCSE incorporated feedback into revised DOE PEV Readiness Assessment. • REVI to discuss factsheet at future meeting.	• N/A
3. Zoning and Parking Rules Lack of standard regional ordinances that facilitate the installation and access to publicly available charging infrastructure.	• Discussed locally at PEV Workshop at CCSE on 6/14/12. • REVI provided feedback on barrier assessment on 11/8/12, CCSE incorporated feedback into DOE PEV Readiness Assessment. • REVI to discuss factsheet at future meeting.	• N/A
4. Training and Education for Municipal Staff and Electrical Contractors Lack of knowledge about PEVs and EVSE	• Discussed locally at PEV Workshop at CCSE on 6/14/12. • Included in revised DOE PEV Readiness Assessment. Discussion of inclusion of these materials in the Regional PEV Readiness Plan at a future meeting. • Special training on PEV infrastructure for municipal/agency staff was held on 1/29/13 at the Energy Innovation Center. • The NAFTC is offering a free online electric drive vehicle first responder training program. • Distributed information on Cuyamaca College EVITP training (free 24 hour class) to REVI members.	• N/A

Barriers/Solutions Being Addressed by Statewide Department of Energy PEV Project and REVI Priority: High Medium Low		
Barrier	**Progress on Solutions – Preparation of Guidance Materials**	**Action Items**
5. Lack of Public Knowledge of PEV and EVSE Municipal outreach to Local Residents and Businesses	• Discussed locally at PEV Workshop at CCSE on 6/14/12. • Discussed CVRP PEV owner survey results at 9/20/12 REVI meeting. • Included in revised DOE PEV Readiness Assessment. REVI will discuss the inclusion of these materials into the Regional PEV Readiness Plan at a future meeting.	• N/A
6. EVSE at Multi Unit Dwellings Consumer lack of knowledge regarding EVSE installation in these buildings. Need to educate and work with HOAs to identify and find solutions to unique building challenges.	*Region is recognized leader on this issue.* • REVI guidance materials are to complement SDG&E efforts and materials. • Discussed by REVI at 5/17/12 and 7/19/12 meetings. Draft guidance materials were included in 7/19/12 meeting. Discussed CEC Funding for Multicharge project on 9/20/12. • Members suggested working on this concurrently with state's PEVCC multi-unit dwelling (MUD) working group, co-chaired by Joel Pointon, SDG&E • MUD working group to develop case studies starting with installations in San Diego. • REVI to re-engage at future meeting when draft PEVC materials are available. • SDG&E holds quarterly MUD workshops including one that was expressly for REVI. • SDG&E produced fact sheet on EVSE install process for MUDs. • In early March, SDG&E published a case study on EV charger installations at a mid-rise luxury condominium community in downtown San Diego that included individual meters with TOU rates and dedicated parking spaces, and removed property management for any responsibility related to vehicle charging.	• Incorporate SDG&E's MUD charging case study into the draft guidance materials.

Barriers/Solutions Being Addressed by Statewide Department of Energy PEV Project and REVI

Priority: High Medium Low

Barrier	Progress on Solutions – Preparation of Guidance Materials	Action Items
7. Regional Planning for Public EVSE Siting Regional land use and transportation plans served as a basis to identify optimal public EVSE sites. In rollout of EV Project, experience was different from planning. Alternate approaches have been taken to increase public EVSE hosts and sites.	*Region is recognized innovator on this issue.* • SANDAG to bring REVI documentation of initial EV Project approach to identifying optimal sites for publicly accessible EVSE using weighted criteria based on local land uses and transportation network. SANDAG produced regional maps of optimal Level 2 and DC Fast Charge sites with input from local EV Project stakeholder group. • Course corrections and alternative approaches to be discussed at future meeting. • REVI to discuss basis for creating a factsheet on regional planning for public EVSE at 3/21/2013 meeting.	• REVI to discuss regional planning approaches used to site public EVSE at 3/21/2013 meeting.
8. On Peak Charging – TOU Utility Rates A. Need to discourage charging when electricity supplies are in high demand and cost more. Support of time of use (TOU) pricing. B. High demand charges that impact EVSE host utility bills. Expensive metering options to access TOU rates.	*Region is recognized leader on TOU PEV rates.* A. Local standout area for solution/ use of TOU rates that encourage off-peak charging. SDG&E holds regular workshops on EVSE hosting and PEV Rates. B. Question for REVI: Is this a regional barrier to hosting EVSE? This was initially identified as a barrier in 2010.	• N/A
9. Public Agency EVSE Installations Contracting issues have stalled many public agencies from taking part in The EV Project. Need to identify common project barriers and find solutions.	• Discussed by REVI at 9/20/12 and 11/8/12 meetings, special add-on meeting held 9/26/12. • At the 1/17/13 meeting, REVI members requested a template be provided for RFP preparation work and review criteria. • REVI members provided feedback on draft RFP template and review criteria at 2/21/2013 meeting.	• The revised RFP template to be reviewed by REVI at 3/21/2013 meeting.
10. Commercial and Workplace Charging Lack of understanding regarding benefits and approaches to understanding workplace charging.	• Commercial installation issues discussed by REVI at 7/19/12 meeting. CEC Funding for workplace/commercial charging discussed at 9/20/12 meeting. • REVI to discuss commercial EVSE installations at 3/21/2013 meeting.	• CCSE staff will present a discussion paper that analyzes the value proposition for hosting EVSE infrastructure to REVI at 3/21/2013 meeting.

Barriers/Solutions Being Addressed by Statewide Department of Energy PEV Project and REVI

Priority: High Medium Low

Barrier	Progress on Solutions – Preparation of Guidance Materials	Action Items
11. PEVs in Government Fleets Procurement justification needed for local public fleets. Need to describe PEV benefits, including role in reducing municipal GHGs for Climate Action Plans.	• Research underway on incorporation of EVs in Climate Action Plans	• N/A

RESIDENTIAL PERMIT AND INSPECTION TEMPLATE

Document's Purpose (to be removed prior to implementation and distribution)

This template has been developed to provide local jurisdictions with standardized information related to the permit, install, and inspection processes for residential EV chargers. It can be modified as a jurisdiction desires. The intended audience for this template is PEV owners and secondary audience is EVSE installers (electricians). The REVI has prepared this template in response to a recognized need for streamlined permit and inspection processes. This is intended to provide clear information to homeowners and electrical contractors about EVSEs and residential EV charger requirements. Additional Resources are attached for jurisdictions interested in providing additional information to staff, homeowners, and/or electrical contractors.

RESIDENTIAL ELECTRIC VEHICLE CHARGER GUIDELINES

How do I charge my plug-in electric vehicle at home?

The type of plug-in electric vehicle (PEV) you purchase will determine the ways you can charge your vehicle. There are two basic types of EV chargers for home use (Level 1 and Level 2). Consult with your car dealership about your home charging options.

Level 1 charging can be done by plugging directly into a standard 120-volt household outlet (three-pronged outlet). PEVs come standard with a 120-volt charging cord that enables PEV owners to charge their vehicles with a conventional 120-volt outlet.

Several manufacturers sell Level 2 EV chargers for the home, which are capable of charging PEVs in half the time as Level 1. A Level 2 EV charger uses a dedicated 240-volt circuit for faster charging and generally requires a permit. Level 2 charging generally requires the installation of a dedicated circuit close to where your vehicle is parked (usually in the garage, carport or driveway). Visit www.GoElectricDrive.com for information on available EV chargers. In order to obtain the permit you (or your electrical contractor) will need to provide some basic information to show that your existing electrical service can handle the added load.

Charging Level	Power Supply	Charger Power	Miles/Hour of Charge	Type of PEV	
				100% Electric	Plug-In Hybrid
Level 1	120 VAC	1.4 kW (onboard charger)	~3–4 miles	~17 hours	~9 hours
Level 2	240 VAC	3.3 kW (onboard charger)	~8–10 miles	~7 hours	~3 hours
		6.6 kW (onboard charger)	~17–20 miles	~3.5 hours	~1.5 hours

What information do I need to provide to obtain a permit?

This Residential EV Charger Permit Guideline has been developed to streamline the permit, installation and inspection process. Please visit the [Insert department name] at [Insert department physical address] to apply in-person or [Insert website address] to apply online. In most cases, you (or your contractor) simply need to submit the permit application and associated documentation outlined below.

Documentation*	Description
Permit application	Electrical permit or special permit for EV chargers [to be identified by jurisdiction]
EVSE Manufacturer's Information	The manufacturer's installation instructions and EV charger specifications.
Site Plan	Identify the complete layout of existing parking spaces and proposed location of EVSE parking space(s) with respect to existing building and structures.
Electrical Load Calculations	Home electrical load calculation that estimates if an existing electrical service will handle the extra load from a residential EVSE and wiring methods based on the California Electrical Code (CEC). Note that CEC Article 220 requires load calculations if the existing service panel is rated less than 200 amps. (See sample load calculation attached.)
Electrical Plans	Single line diagrams showing the system, point of connection to the power supply and the EVSE. (See sample electrical plan attached)
* Documentation will be specific to each jurisdiction	

If all of the required information is provided and the proposal complies with the applicable codes, the review and approval process for your permit will usually occur within [Insert review turnaround time in days or weeks].

EV charger installation

PEV owners are encouraged to choose a licensed local electrical contractor to install your EV charger (electrical vehicle supply equipment). The electrician should have a C-10 license along with the expertise, tools and training for installing home EV chargers. You can verify your electrical contractor is licensed by visiting www.CSLB.ca.gov or by calling (800) 321-CSLB. The contractor should follow the installation instructions of the EV charger manufacturer and the requirements of California Electrical Code.

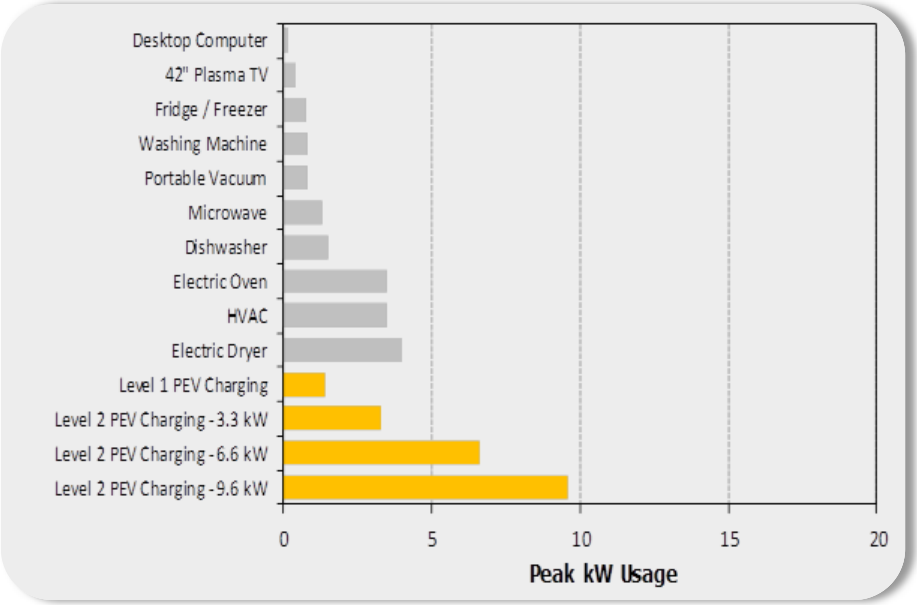
Is an inspection required for my EV charger?

Yes, all EV charger installations are required to be inspected before they can be used. Upon completion of the installation, it is your responsibility (or your contractor's) to schedule a final inspection with the Jurisdiction. In order to schedule an appointment, please call Insert inspection call in phone number. The inspection will generally occur within Inspection turnaround time of the request.

Contact SDG&E before installing your EV charger

Though an individual Level 2 EV charger may have a negligible impact on the utility electric system, the combined effect of several chargers in the same neighborhood could result in overloads on utility secondary wires and transformers. It is important that SDG&E be notified of any Level 2 charger installations to ensure that utility electrical system components are adequately sized to maintain service reliability in your neighborhood. The chart below compares PEV charging to other household appliances. By contacting SDG&E, you will learn of special EV

charger rates offered by SDG&E. These rates can provide you a significantly lower cost for electricity based on the time of day you charge your vehicle. For more information, visit www.sdge.com/ev.



Additional Resources

1. *Load Calculations Worksheet,* used by Cities of Oceanside, Riverside, and San Diego
2. *EVSE Inspection Checklist*, Endorsed by the National Electrical Contractors Association
3. *The Electrician's Guide: Installing Electric Vehicle Charging Stations at Single-Family Homes*, Southern California Edison
4. *Streamlining the Permitting and Inspection Process for Plug-In Electric Vehicle Home Charger Installations*, California Plug-in Electric Vehicle Collaborative, July 2012 (34 page report located at www.evcollaborative.org/sites/all/themes/pev/files/PEV_Permitting_120827.pdf)

LEVEL 2 ELECTRIC VEHICLE CHARGER - SERVICE LOAD CALCULATION

INSTRUCTIONS: Review the list of electrical loads in the table below and check all that exist in the home (don't forget to include the proposed Level 2 EV Charger). For each item checked, fill-in the corresponding "Watts used" (refer to the "Typical Usage" column for wattage information). Add up all of the numbers that are written in the "Watts Used" column. Write that number in the "Total Watts Used" box at the bottom of the table and proceed to the next page.

(Loads shown are rough estimates; actual loads may vary – for a more precise analysis, use the nameplate ratings for appliances and other loads and consult with a trained electrical professional.)

✓Check All Applicable Loads	Description of Load	Typical usage	Watts used
GENERAL LIGHTING AND RECEPTACLE OUTLET CIRCUITS			
✓	Multiply the Square Footage of House X 3	3 watts/sq. ft.	
KITCHEN CIRCUITS			
✓	Kitchen Circuits	3,000 watts	3,000
	Electric oven	2,000 watts	
	Electric stove top	5,000 watts	
	Microwave	1,500 watts	
	Garbage Disposal under kitchen sink	1,000 watts	
	Automatic Dish washer	3,500 watts	
	Garbage Compactor	1,000 watts	
	Instantaneous hot water at sink	1500 watts	
LAUNDRY CIRCUIT			
✓	Laundry Circuit	1,500 watts	1,500
	Electric Clothes Dryer	4,500 watts	
HEATING AND AIR CONDITIONING CIRCUITS			
	Central Heating (gas) and Air Conditioning	6,000 watts	
	Window mounted AC	1,000 watts	
	Whole-house or attic fan	500 watts	
	Central Electric Furnace	8,000 watts	
	Evaporative Cooler	500 watts	
OTHER ELECTRICAL LOADS			
	Electric Water Heater (Storage type)	4,000 watts	
	Electric Tankless Water Heater	15,000 watts	
	Swimming Pool or Spa	3,500 watts	
	Other: (*describe)*		
	Other:		
	Other:		
ELECTRIC VEHICLE CHARGER CIRCUIT			
	Level 2 Electric Vehicle Charger rating*		
(Add-up all of the watts for the loads you have checked ✓) **TOTAL WATTS USED ➔**			

Use name plate rating in watts or calculate as: (Ampere rating of circuit X 240 volts = Watts)

INSTRUCTIONS: Apply the ***Total Watts Used*** number from the previous page to the Table below to identify if the Existing Electrical Service Panel is large enough to handle the added electrical load from the proposed Level 2 EV Charger. If your electrical service is NOT large enough, then you will need to install a new upgraded electrical service panel.

Table based on NEC 220.83 (A).

✓Check the appropriate line	Total Watts Used	Minimum Required Size of Existing 240 Volt Electrical Service Panel *(Main Service Breaker Size)*	Identify the Size of Your Existing Main Service Breaker *(Amps)***
	up to 24,000	60 amp	
	24,001 to 48,000	100 amps	
	48,001 to 63,000	125 amps	
	63,001 to 78,000	150 amps	
	78,001 to 108,000	200 amps	
	108,001 to 123,000	225 amp	

**Please note that the size of your Existing service MUST be equal to or larger than the Minimum Required Size identified in the Table above or a New Upgraded electrical service panel will need to be installed (separate permit required for new service).

CAUTION: This table is **NOT** to be used to determine the size of a ***NEW UPGRADED*** Electrical Service Panel if your existing panel is too small or overloaded according the Table above. In order to determine the size of a NEW or UPGRADED Service Panel, there is a completely different load calculation methodology that applies. Sizing of a NEW or UPGRADED Electrical Service Panel should only be done by a qualified Electrical Contractor or Electrical Engineer.

STATEMENT OF COMPLIANCE

By my signature, I attest that the information provided is true and accurate.

Job Address: _____
(Print job address)

Signature: _____ _____
(Signature of applicant) (Date)

In addition to this document, you will also need to provide a copy of the manufacturer's installation literature and specifications for the Level 2 Charger you are installing.

Please note that this is a voluntary compliance alternative and you may wish to hire a qualified individual or company to perform a thorough evaluation of your electrical service capacity in lieu of this alternative methodology. Use of this electrical load calculation estimate methodology and forms is at the user's risk and carries no implied guarantee of accuracy. Users of this methodology and these forms are advised to seek professional assistance in determining the electrical capacity of a service panel.

OTHER HELPFUL INFORMATION FOR EV CHARGER INSTALLATIONS:

The Table below illustrates the type and size of wire and conduit to be used for various Electric Vehicle Charger circuits.

Size of EV Charger Circuit Breaker	Required minimum size of Conductors (THHN wire)	Conduit Type and Size***		
		Electrical Metallic Tubing (EMT)	Rigid Nonmetallic Conduit – Schedule 40 (RNC)	Flexible Metal Conduit (FMC)
20 amp	#12	1/2"	1/2"	1/2"
30 amp	#12	1/2"	1/2"	1/2"
40 amp	#10	1/2"	1/2"	1/2"
50 amp	#8	3/4"	3/4"	3/4"
60 amp	#6	3/4"	3/4"	3/4"
70 amp	#6	3/4"	3/4"	3/4"

******Based on 4 wires in the conduit (2-current carrying conductors, 1-grounded conductor, 1-equipment ground).***

As an alternate, Nonmetallic Sheathed Cable (aka: Romex Cable or NMC) may be used if it is protected from physical damage by placing the cable inside a wall cavity or attic space which is separated from the occupied space by drywall or plywood.

The Table below illustrates the required supports for various types of electrical conduit or cable.

Conduit Support	Electrical Metallic Tubing (EMT)	Rigid Nonmetallic Conduit – Schedule 40 (RNC)	Flexible Metal Conduit (FMC)	Nonmetallic Sheathed Cable (NMC)
Conduit Support Intervals	10'	3'	4-1/2'	4-1/2'
Maximum distance from box to conduit support	3'	3'	1'	1'

In addition to the above noted requirements, the California Electrical Code contains many other provisions that may be applicable to the installation of a new electrical circuit. Installers are cautioned to be aware of all applicable requirements before beginning the installation. For additional information or guidance, consult with the Building and Safety Division staff or a qualified and experienced Electrical Contractor.

GENERAL INSTALLATION GUIDELINES FOR LEVEL 2 RESIDENTIAL EV CHARGERS

1. GENERAL REQUIREMENTS - All Electrical Vehicle Charging Systems shall comply with the applicable sections of the California Electrical Code, including Article 625.

2. EQUIPMENT HEIGHT - The coupling means of the Electric Vehicle Supply Equipment shall be stored at a height of 18 – 48 inches above the finished floor. (CEC Art 625.29(B)).

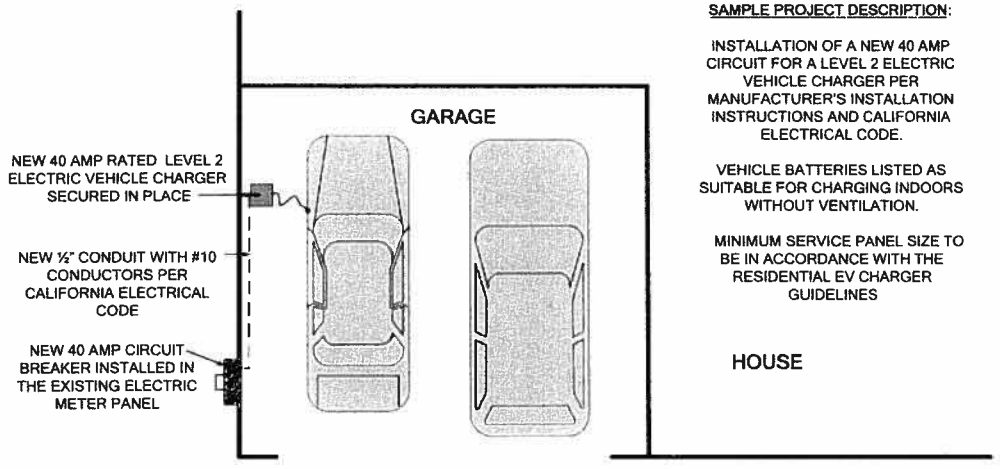
3. LISTED EQUIPMENT - All Electric Vehicle Supply Equipment shall be listed by a nationally recognized testing laboratory.

4. FASTENED IN PLACE - Level 2 Electric Vehicle Supply Equipment must be permanently connected and fastened in place in accordance with the manufacturer's installation instructions (CEC Art. 625.13).

5. PROTECTION FROM PHYSICAL DAMAGE - Electrical Vehicle Supply Equipment shall be protected against vehicle impact damage when located in the path of a vehicle. In order to avoid the installation of a substantial pipe bollard as an equipment guard, locate the Electrical Vehicle Supply Equipment on a garage side wall, out of vehicular path. (see sample drawing below) (CEC Art. 110.27(B))

6. IF MORE THAN 60 AMPS- When EV charging equipment is rated at more than 60 amps, the disconnect means shall be provided and installed in a readily accessible location and shall be capable of being locked on the open position. (CEC Art. 625.23)

SAMPLE ELECTRICAL PLAN FOR LEVEL 2 ELECTRIC VEHICLE CHARGER CIRCUIT INSTALLATION



SAMPLE PROJECT DESCRIPTION:

INSTALLATION OF A NEW 40 AMP CIRCUIT FOR A LEVEL 2 ELECTRIC VEHICLE CHARGER PER MANUFACTURER'S INSTALLATION INSTRUCTIONS AND CALIFORNIA ELECTRICAL CODE.

VEHICLE BATTERIES LISTED AS SUITABLE FOR CHARGING INDOORS WITHOUT VENTILATION.

MINIMUM SERVICE PANEL SIZE TO BE IN ACCORDANCE WITH THE RESIDENTIAL EV CHARGER GUIDELINES

Approved _____ Issue Date: October 12, 2012

R. Steven Jones, Building Service Administrator

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE) INSPECTION CHECKLIST

Key Concerns for Electric Vehicle Supply Equipment Inspections
1. Is the appropriate permit secured and is there a plan and calculation as required by the AHJ?
2. What type of electric vehicle supply equipment (EVSE) is being installed (i.e. Level 1, Level 2, other)?
3. Where is the EVSE located in relation to the charging location and the service or supply source?
4. Is the EVSE listed by an NRTL and are the installation instructions available for reference?
5. Is the EVSE going to be cord-and-plug connected (and so listed) or direct wired to an individual branch circuit?
6. What amount of voltage and current is required for the type of EVSE (nameplate information)?
7. Is the EVSE securely mounted to the structure and individual branch circuit wiring installed per NEC?
8. Is the properly sized equipment grounding conductor connected and proper overcurrent protection provided?
9. Does the service or source have adequate capacity for the load served?
10. Are separate utility meter(s) and/or service disconnecting means installed for special utility rates?

INSPECTION CHECKLIST (non-inclusive)

EVSE Inspection Activity Details				
	Item	Inspection Activity	Code Reference	Comments
	1.	Verify permit is posted and all plans, calculations and installation instructions are available as required. May require use of examples in NEC Chapter 9. A calculation may be required to determine adequate capacity.	Local Regulations and NEC 90.8, 220.12, 220.14, 220.16, 220.82	
	2.	Verify that the EVSE is listed by an NRTL and installation instructions are provided.	NEC 90.7, 625.5, 110.3(B)	
	3.	Verify the EVSE location and that it is securely fastened to the structure and guarded from physical damage as required.	NEC 110.13, 110.27(B), 625.29, 625.30	
	4.	Determine if EVSE is directly wired to the branch circuit or is cord-and-plug connected. Must be listed for cord-and-plug connection. Individual receptacle reqd.	NEC 110.3(B), 625.13, 625.18, 625.19, 625.29	
	5.	Verify an individual branch circuit is installed for the EVSE. Applies to Level 1, Level, 2, and fast chargers. Branch circuit and feeders (if applicable) must be sized 125% of nameplate current.	NEC Article 100 continuous load, 210.19(A)(1), 215.2(A), 625.21	
	6.	Verify installed branch circuit wiring method is listed and securely fastened to the structure. Listed wiring and fittings must be installed. Check fished and surface wiring.	NEC 300.11 and the applicable .30 section of article	
	7.	Verify the size of the branch circuit overcurrent protection is per nameplate and protects the conductors.	NEC 110.3(B), 240.4	
	8.	Verify circuit conductors are sized not less than 125% of EVSE nameplate current. Be sure that the conductor ampacity complies with the rating of the overcurrent protection.	NEC 210.19(A)(1), 215.2(A), 110.3(B), Table310.15(B)(16), 310.15(B).	
	9.	Verify properly sized equipment grounding conductor is installed with the branch circuit and connected at the EVSE and to panelboard or service. Verify the equipment grounding conductor is identified.	NEC 250.110, 250.112, 250.114, 250.120, 300.3(B), 250.119, 250.122.	

	10.	Check the electrical connections of the circuit conductors and equipment grounding conductor connections.	NEC 110.14, 250.148(A) Annex I	
	11.	Verify disconnecting means is provided and properly located for EVSE rated greater than 60 amperes and 150 volts.	NEC 625.23	
	12.	Verify installation of EVSE is in a neat and workmanlike manner.	NEC 110.12, NECA 1, NECA 413	
	13.	Verify existing service conductors are of adequate size. For Level 2 EVSE installations, identify any existing service conductor sizes that might have been installed using NEC 310.15(B)(7) and Table 310.15(B)(7)	NEC 230.31, 230.42, 310.15(B)(7) and Table 310.15(B)(7)	
	14.	Verify circuit breaker compatibility with existing panelboard or service equipment. Must be manufactured by the panelboard or service equipment manufacturer.	NEC 110.3(B), Article 240 Part VII, Article 408 part I	
	15.	Branch circuit device and any disconnects must be identified as to the use.	NEC 408.4(A), 110.22(A)	
	16.	Where separate utility metering and enclosures are installed, verify NEC compliance for service equipment and conformance to applicable utility regulations.	Utility company regulations and NEC Article 230	
	17.	Verify equipment is suitable for connection to the line side of the service disconnecting means.	NEC 230.82	
	18.	Verify sufficient working space is provided at EVSE, Panelboards, service equipment, and disconnects.	NEC 110.26	
	19.	Verify additional service disconnects (if installed) are grouped.	NEC 230.72	
	20.	Verify the maximum number of service disconnects has not been exceeded	NEC 230.71	
	21.	Verify that any additional service disconnect is properly rated.	NEC 230.79	
	22.	Verify the wiring method used for the additional service conductors installed.	NEC 230.43	
	23.	Verify that additional service disconnects are properly identified.	NEC 230.70(B)	
	24.	Verify service disconnect is listed as suitable for use as service equipment.	NEC 230.70(C)	
	25.	Verify the overcurrent protection for any newly installed service equipment and conductors.	NEC 230.90, 230.91	
	26.	Verify grounded conductor (neutral) is brought to the service disconnect and bonded to the enclosure.	NEC 250.24(C)	
	27.	Verify metal service equipment enclosures and raceways are bonded together effectively.	NEC 250.92, 250.92(B)	
	28.	Supply-side bonding jumpers are sized properly	NEC 250.102(C), 250.66	
	29.	Verify existing service grounding and bonding.	NEC 250.50, 250.104(A) and (B)	
	30.	Verify EVSE that is intended to be used as interactive systems, bi-directional, or optional standby systems be listed for that purpose.	NECA Articles 702 and 705	

** Note: These items included in the checklist are non-inclusive and are to serve as a guide or basis for inspection. They do not include any local Code requirements or regulations.*

THE ELECTRICIAN'S GUIDE:

Installing Electric Vehicle Charging Stations at Single-Family Homes

Preparing a home for electric vehicle charging requires the collaboration of several parties to help our mutual customers make the right decisions for their personal situations. Southern California Edison (SCE), electricians*, customers and cities each play important roles in this process.

This guide provides useful information on the process for preparing single-family residences for safe and reliable electric vehicle (EV) charging.

The process *may* include installing a dedicated circuit for EV charging, installing an EV charging station, upgrading an existing electrical panel, or adding a second electrical panel, meter socket box and/or two-meter socket panel to accommodate separate EV metering. Installing this equipment is ***optional*** and depends on the ***SCE rate plan*** the customer enrolls in and the level at which the customer ***chooses to charge the vehicle*** (120 volts or 240 volts). Each customer should select his/her rate plan and charging level before the electrician begins any electrical work on the house. Otherwise, customers and electricians alike run the risk of costly delays.

Before you assess your customers' home panel and wiring needs, please ensure that customers who live in SCE's service territory contact us to learn about their rate plan options and how each rate plan may affect their home panel, wiring and electric vehicle charging options.

Please ask your customer to call an **SCE Home Fuel Advisor**SM:
1-800-4EV-INFO
(1-800-438-4636)

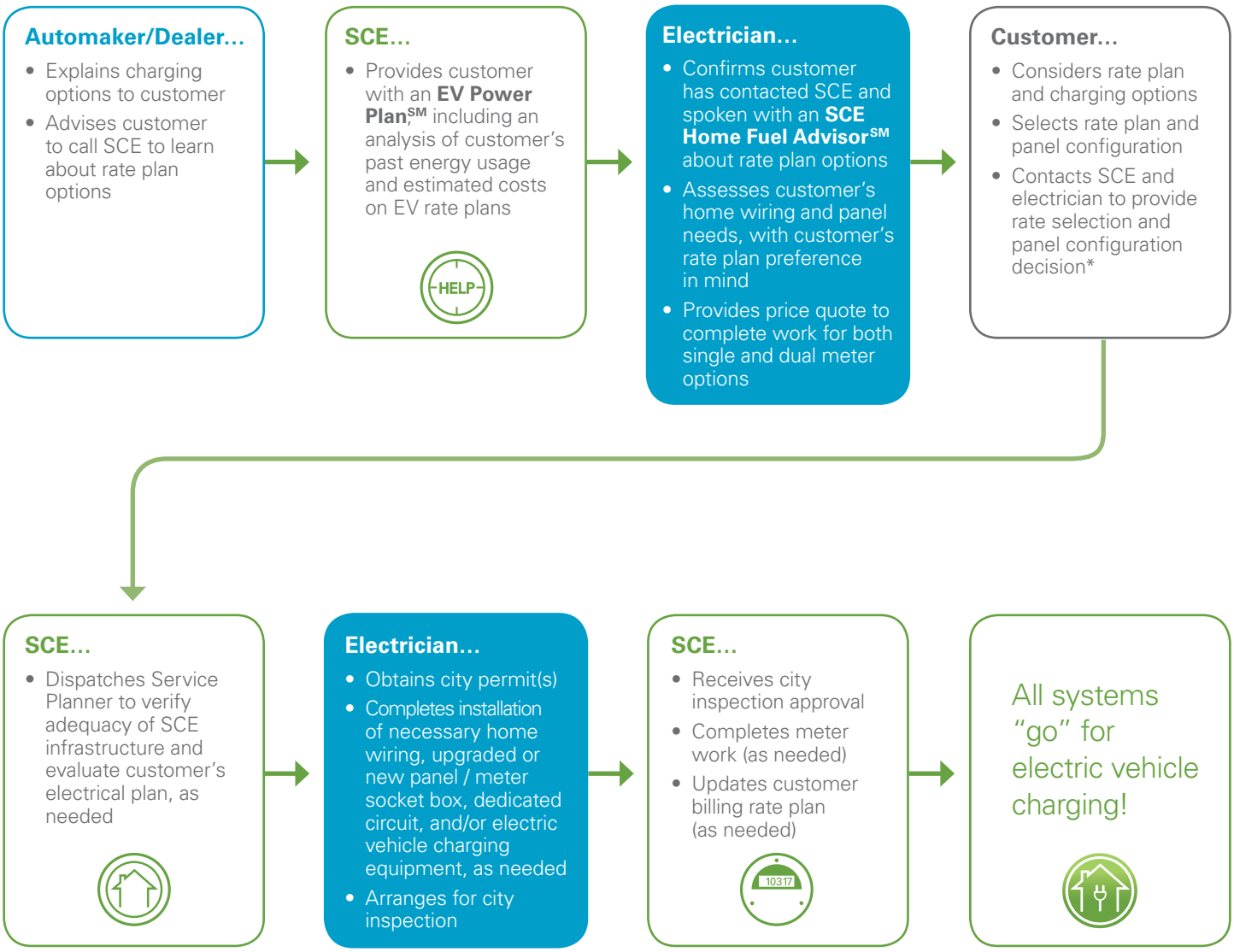
Customers can also visit:
sce.com/ElectricVehicle

For step-by-step training modules, customer handouts and more, visit:
sce.com/EVInstall

*The term "electrician," as used throughout this guide, includes entities such as independent electricians, electrical contractors and third parties offering end-to-end EV services.

Installation Process

The flowchart below illustrates the basic processes used by SCE to prepare single-family residences for electric vehicle charging. Also shown are the points at which electricians play an especially important role in moving the installation process forward.



* By reminding your customer to call both you **and** SCE after deciding on the electrical work, SCE can send a Service Planner to the customer's home so you can finish your work as quickly as possible. Knowing a customer's rate plan selection, electrical vehicle charging level, and planned panel configuration will allow SCE's Service Planner to properly inspect the local transformer and service drops and evaluate the customer's electrical plan.

Important Steps for Electricians

1. Confirm customer has contacted SCE about rate plan options and implications ***before*** you conduct a home assessment of electrical panel and wiring needs. If not, direct your customer to call 1-800-4EV-INFO (1-800-438-4636) M-F, 8:00 am - 5:00 pm.
2. Evaluate residential electrical panel and wiring for ***capacity*** to charge the electric vehicle at the desired charging level.
3. Provide a price quote to complete electrical work for ***all*** applicable rate/panel options.
4. Once SCE has approved the proposed electrical plan, upgrade the existing panel or add a second panel or meter socket box, as necessary, in accordance with customer's selected rate plan.
5. If customer selects the Electric Vehicle Plan (two meters): Install the appropriate panel option and remember that this power is for **EV charging only.** *Note: SCE will install the second meter after the panel is installed and the city approves the installation.*
6. Refer to **SCE's Electric Service Requirements (ESR)** for complete panel configuration details (*sce.com/EVInstall*).

Rate/Panel Options

The combination of SCE electric vehicle rate plans and panel configurations yields 6 rate/panel options:

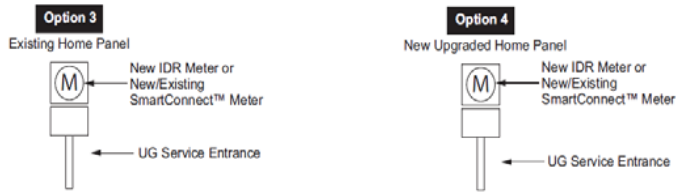
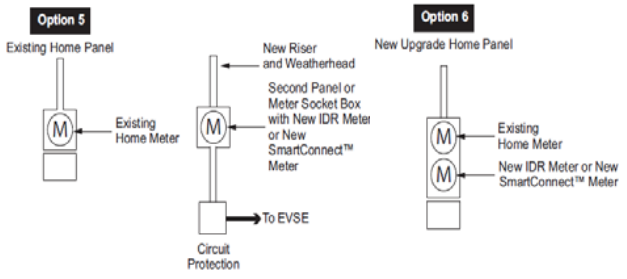
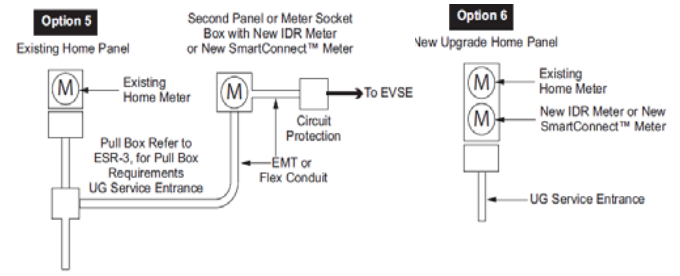
Rate Plans	Rate Description	Panel Choices		
		Use Existing Panel	Add 2nd Panel or Meter Socket Box	Upgrade Existing Panel
Residential Plan (Your Current Rate) *Single Meter*	**Your Current Rate** Home and electric vehicle loads measured together	 **Option #1** (no meter change)	N/A	 **Option #2** (meter may need to be replaced)
Home & Electric Vehicle Plan (TOU-D-TEV) *Single Meter*	**Time-of-Use Tiered Rate*** Home and electric vehicle loads measured together; rates higher during the day and lower at night	 **Option #3** (meter may need to be replaced)	N/A	 **Option #4** (meter may need to be replaced)
Electric Vehicle Plan (TOU-EV-1) *Two Meters*	**Time-of-Use Rate** Electric vehicle load metered separately from home load; home remains on current rate and meter; electric vehicle rate is higher during the day and lower at night	N/A	 **Option #5** (panel upgrade or addition must take place before second meter is installed) See page 4 for detailed panel configurations.	 **Option #6**

*With tiered rates, cost per kWh increases with the amount of electricity used.

Panel Configurations

SCE publishes and maintains an Electrical Service Requirements (ESR) document* describing SCE rules pertaining to electrical service connections and customer installations of service wiring and equipment. Creating an acceptable work plan for electric vehicle charging, by adhering to ESR requirements, will help you and your customers save time and money by avoiding the planning (or beginning) of work that otherwise may not be approved by SCE and/or your local building inspector.

The following abbreviated information can be found in its complete form in Chapter ESR-1, Section 5. The figures below show both overhead (left side) and underground (right side) connection diagrams for the six most common rate/panel options:

Overhead Service	Underground Service
Residential Plan (D) – Single Meter 	**Residential Plan (D) – Single Meter** 
Home & Electric Vehicle Plan (TOU-D-TEV) – Single Meter 	**Home & Electric Vehicle Plan (TOU-D-TEV) –Single Meter** 
Electric Vehicle Plan (TOU-EV-1) –Two Meters 	**Electric Vehicle Plan (TOU-EV-1) – Two Meters** 

Note 1: SCE provides *only a single service line* for all panel configurations, regardless of whether one or two panels are installed.

Note 2: Where at all possible, the second panel or meter socket box shall be at the same location and directly adjacent to the existing metering.

Key

UG:	Underground
OH:	Overhead
IDR:	Interval Data Recorder
EMT:	Electrical Metallic Tubing
EVSE:	Electric Vehicle Service Equipment

* SCE's Electrical Service Requirements are available on the web at **sce.com/EVInstall**.

Panel Configurations

The following abbreviated information can be found in its complete form in Chapter ESR-5, Section 9. The figures below describe required clearances when electrical panels are either upgraded or added to a residence:

Figure 5–4: Separation of Meter Assemblies for Electric and Gas Services

1. Maintain a 3-foot clear, level, and unobstructed workspace in front of electric service equipment.
2. Plumbing fixtures extending more than 6 inches out from wall surface must be located 18 inches minimum from the outside edge of the meter panel.
3. This drawing pertains to both overhead and underground electric service applications.
4. Size and dimensions of panels will vary. Drawings are not to scale.

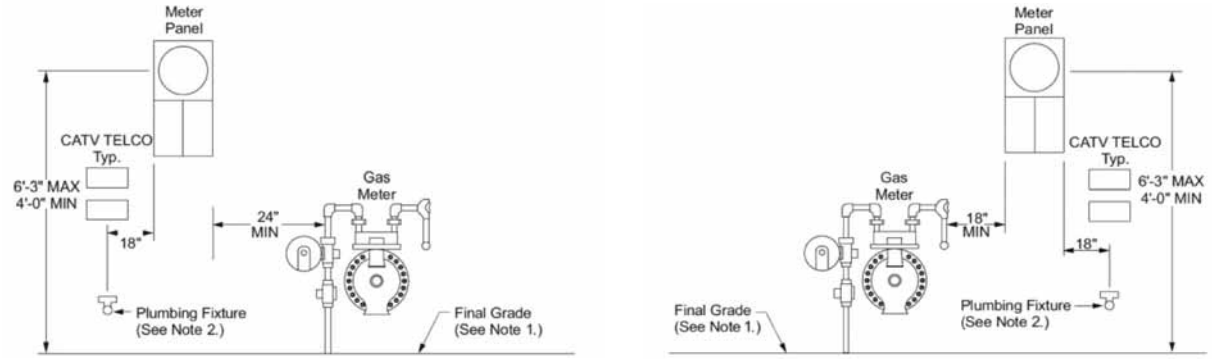
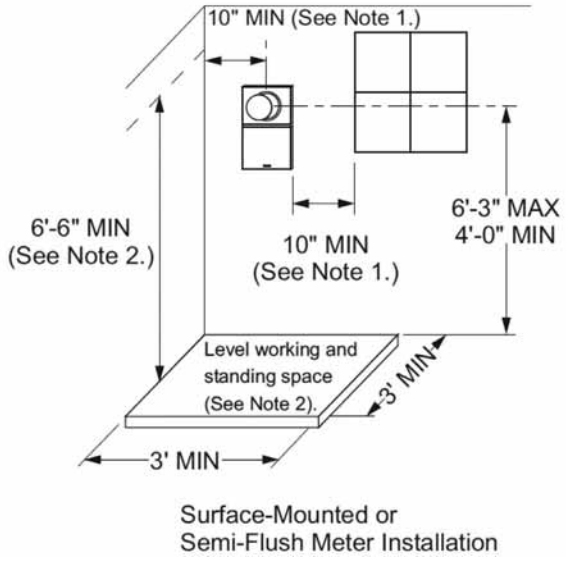


Figure 5–5: Surface-Mounted or Semi-Flush Meter Installation

1. The horizontal clearance from the centerline of the meter to the nearest side wall or other obstruction shall be 10 inches minimum. A horizontal clearance from the edge of the meter panel to the edge of a window or doorway (including sliding glass doors) shall be 10 inches minimum. A gas meter or plumbing fixture that does not protrude more than 6 inches out from the wall, or extend less than 18 inches horizontally from the outside edge of the meter panel, shall not be considered an obstruction. See Figure 5–4 (Page 5–24).

2. A level working and standing surface, clear and unobstructed, entirely on the property of the customer, shall be provided. The minimum width of the workspace shall be 36 inches overall, but need not be centered beneath the meter. The minimum depth of the workspace shall be 36 inches. Where meters are enclosed in a closet or recessed in an enclosure, the depth of the workspace is measured from the outer face of the closet or recess. The minimum height of the workspace shall be 78 inches.



Additional sections of SCE's Electrical Service Requirements may be applicable depending on customer infrastructure. Please review the ESR in full to ensure comprehensive compliance with these requirements.

* SCE's Electrical Service Requirements are available on the web at **sce.com/EVInstall.**

Best Practices for Electricians to Help Customers Get Ready for EV Charging

- ✓ Anticipate playing a coordinating role among the customer, SCE, local authority having jurisdiction and possibly the property owner or homeowner's association.
- ✓ Encourage your customer to contact SCE and speak with an **SCE Home Fuel Advisor** at **1-800-4EV-INFO** (1-800-438-4636), M-F, 8:00 am - 5:00 pm, before conducting your initial home assessment to ensure the customer understands SCE's EV rate plans and installation implications.
- ✓ Be familiar with SCE's EV rate plans and installation implications to help guide the customer through the process.
- ✓ Be familiar with SCE's ESR to ensure your plans and work are ESR-compliant.
- ✓ Visit **sce.com/EVInstall** and review the ESR on a quarterly basis for possible EV updates.
- ✓ Provide customer with estimates for one and two-meter options to prevent delays and added costs if customer changes rate plan choice.
- ✓ Participate in the SCE Service Planner's visit to the customer site in person or by phone to discuss the electrical plan, as necessary.
- ✓ Confirm the customer's plan is approved by an SCE Service Planner, as necessary, before initiating the work.

DRAFT REQUEST FOR PROPOSAL (RFP) TEMPLATE:

Installation and Operation of Electric Vehicle Charging Stations

The following is a Request for Proposal (RFP) template that provides recommended headings and proposal language to assist in the issuance of an RFP for Electric Vehicle Charging Stations. In the outline, a brief summary is provided for each heading and this information can and should be customized for each individual RFP. This outline was created based off of information gathered from RFP's drafted by the City of Chula Vista and the City of Long Beach.

Disclosure: *Proposals shall be kept confidential until a contract is awarded. The <insert jurisdiction> reserves the right to request clarification of any proposal term from prospective vendors. Selected vendor(s) will be notified in writing. Any award is contingent upon the successful negotiation of final contract terms. Negotiations shall be confidential and not subject to disclosure to competing vendors unless and until an agreement is reached. If contract negotiations cannot be concluded successfully, the <insert jurisdiction> reserves the right to negotiate a contract with another vendor or withdraw the RFP. Any contract resulting from this RFP shall not be effective unless and until approved by the <insert jurisdiction Council>.*

1. Overview of the Project

Requesting proposals from vendors to fully fund, design, install, operate, maintain, market, and potentially remove electrical vehicle (EV) charging stations, also known as Electric Vehicle Supply Equipment (EVSE), on publically-owned property for public use. This work will also include assisting the jurisdiction in identifying ideal site locations for the EVSE installations.

2. Acronyms/Definitions

A glossary of the necessary acronyms and definitions used throughout the RFP (e.g. "Vendor" – Organization/individual submitting a proposal in response to this RFP)

3. Scope of Project

The Scope of the Project is as follows:

- Provide attractive and well-maintained EVSE.
- Cover all costs associated with installation, maintenance, and electricity for the EVSE. The vendor may establish a service charge and method of payment collection to recoup these costs as well as any operating profit from EVSE users.
- Identify siting locations, including physical address, project site (landmark location), reasoning behind the location selection, and accompanying notes.
- Provide proper EV parking signage and reconfiguration of any parking stalls for EV parking.

- Market the project as well as provide product advertisement.
- Offer options for EVSE when the agreement expires (e.g. charging unit removal, transfer of ownership, contract renewal options).
- The <insert jurisdiction> to provide the required parking spaces to accommodate the EVSE within the parking facilities at no cost to the vendor.

4. Additional Considerations

A. The vendor must agree to insurance and liability requirements (scope and coverages) set by the jurisdiction and state such in its proposal.

<Jurisdiction to insert summary of applicable insurance and liability requirements here and/or can attach full description to end of this template.>

B. <Jurisdiction can add any additional considerations here. For example, if City offers/restricts use of advertisements on or around EVSE.>

~~4.~~5. Submittal Instructions

For questions regarding this RFP, submit all inquiries via email to <insert email address> by <insert due date>. Responses to the questions will be posted <insert where responses will be made available> no later than <insert date>. All proposers are recommended to visit the above mentioned <insert jurisdiction> website on a regular basis as responses will be posted when available.

Proposal Evaluation Process Timeline

TASK:	***DATE/TIME:***
Deadline for submitting questions	<Insert date>
Answers to all questions submitted	<Insert date>
Deadline for submission of proposals	<Insert date>
Evaluation period	<Insert date>
Selection of vendor	<Insert date>

NOTE: These dates represent a tentative schedule of events. The <insert jurisdiction> reserves the right to modify these dates at any time, with appropriate notice to prospective vendors.

Vendors shall submit one (1) original proposal marked “ORIGINAL” and four (4) identical copies to the following:

<Insert Jurisdiction Name>
<Insert Contact Name>
<Insert Address>

Proposals shall be clearly labeled in a sealed envelope or box as follows:

REQUEST FOR PROPOSAL NO.: <insert proposal number>
FOR: Electric Vehicle Charging Stations

Disclosure: *Proposals must be received by <insert date and time>. Proposals that do not arrive by the specified date and time WILL NOT BE ACCEPTED and will be returned unopened. Vendors may submit their proposal any time prior to the above stated deadline. E-mail or fax submissions will not be accepted.*

At its sole discretion, the <insert jurisdiction> may reject incomplete proposal submittals if, in its judgment, the submittal lacks information needed to effectively evaluate the proposal. Nothing in this request for qualifications implies a contractual obligation with any firm, nor will the <insert jurisdiction> reimburse costs for submittal preparation.

Proposal Format:

Vendor Information:

- The legal name of the vendor, address and telephone number.
- The structure of the organization (e.g., sole proprietorship, partnership, corporation, etc.) including state of formation.
- The name, address and telephone number of the person to whom correspondence should be directed.
- The year the company was established as currently being operated.
- A certified financial statement, including, but not limited to a Dun and Bradstreet rating.

Vendor Background & Work Experience:

- A list of all communities within the San Diego Gas & Electric (SDG&E) service territory in which the vendor has provided and maintained publicly-available EVSE during the last five years, if applicable. Please list communities with active EVSE and communities where EVSE have been removed. Also include the following information for each community:
  - Name of the organization that contracted with you for EVSE sites. Please include the name of a contact person and phone number.
  - Was the contract/franchise exclusive or nonexclusive?
  - Number of EVSE provided.
  - Time period that the EVSE were installed.
  - Reporting sales & usage (sample reports)
- A list with additional California communities, and/or communities in United States in which the vendor has provided and maintained publicly-available EVSE during the last five years, if applicable. Include all of the information identified in the previous bullet.
- Please list any public agencies that have chosen to cancel or not renew EVSE contracts with your firm during the last five years. Show names of organizations and names and phone numbers of persons who can be contacted.
- Provide qualifications of the local contractors that will perform the EVSE installations. Demonstrate that the vendor is working with C-10 licensed electrical contractors employing California state-certified electricians to handle EVSE installations and maintenance.

        - List any EVSE-specific trainings or certifications that the vendor's electrical contractor and/or the contractor's electricians have completed, if applicable (e.g. The Electric Vehicle Infrastructure Training Program (EVITP) or UL training).
        - Include the number of EVSE installations completed to date by the vendor's electrical contractor and/or the contractor's electricians.
    - Demonstrate an understanding of <insert jurisdiction> processes, required permits, permit costs, licenses, applicable state and local codes specific to EVSE and procedures for this type of project.

Scope of Work:

- A written and pictorial description of the proposed EVSE design, including:
    - Comprehensive specifications (including make, manufacturer, & model numbers of equipment).
    - Delivery and proposed installation schedule.
    - The submission of more than one type of charging station is permitted, however, if the selection of any particular design would result in a change to the proposed rate structure and method of collection, those changes must be noted.
- Metering configurations identifying how the vendor will provide the electricity to the EVSE end consumer at no cost to the jurisdiction.
    - Process and schedule for reimbursement to the jurisdiction for cost recovery of electricity provided to EVSE (if applicable).
- Proposed EVSE end consumer rate structure (e.g. charging customers per kWh usage or plug time) and customer method of payment (e.g. credit card reader for universal usage or restricted access for only network users).
- Description of the proposed EVSE maintenance program including the location of maintenance facilities, number of staff that will be available for maintenance, and anticipated response times.
- Description of ability and staff expertise to provide services including marketing, installation, monitoring, and maintenance of EVSE.
    - Quality control/safety features.
    - Marketing plan details and available resources.
- Financial incentives to the <insert jurisdiction> (if applicable).
- Options for EVSE when the agreement expires (e.g. charging unit removal, transfer of ownership, contract renewal options) and responsible party for any costs incurred (if applicable). Highly preferred that the vendor cover any removal costs.

Additional Items:

- The proposal must be signed by the individual(s) legally authorized to bind the vendor.
- If complete responses cannot be provided without referencing supporting documentation, such documentation must be provided with the proposal and specific references made to the tab, page, section and/or paragraph where the supplemental information can be found.

~~5.~~6. Proposal Evaluation & Award Process

Proposals will be evaluated based on the following criteria (please reference attached *RFP Criteria Review Template*):

- Current and past vendor performance in similar contracts with other agencies.
- Financial stability of the proposer as reflected in a certified financial statement or other certified statement, including but not limited to a Dun and Bradstreet financial rating.
- EV customer rate structure and method of customer payment that will be used to charge customers.
- Description of metering configuration.
- Process and schedule to reimburse the jurisdiction in order to recoup cost of electricity used to provide EVSE (if applicable).
- Maximum public benefit (i.e., in terms of affordability and customer support).
- Strength, quality, durability, advanced technology, future flexibility, and aesthetic appeal of proposed EVSE.
- Proposed maintenance, repair and replacement schedule including response times for malfunctioning EVSE (e.g. vendor's proximity to the <insert jurisdiction> and number of proposer's employees performing maintenance functions).
- Possible commitment to providing additional EVSE at other <insert jurisdiction> owned parking facilities (desirable but not required).
- Vendor's specific marketing strategy that includes product advertising.
    - EVSE installation marketing plan.
    - Description of the vendor's available marketing resources.
- Proposed options for EVSE (e.g. system removal, transfer of ownership, contract renewal options)when the agreement expires and potential costs to the jurisdiction.
- Overall monetary return to the <insert jurisdiction> (if applicable).

Suggestion for Jurisdiction: Create a scoring criterion that may include assignment of percentages and/or weighting each criterion listed above.

~~6.~~7. Project Specifications

- Provide installation site plans (if applicable [for reference, please see Exhibit A of the City of Long Beach RFP No. PW12-016]).

~~7.~~8. Subcontractor Information and Business License

Does this proposal include the use of subcontractors?

Yes _____ No _____ Initials _____

If "Yes", vendor must:

- Identify specific subcontractors and the specific requirements of this RFP for which each proposed subcontractor will perform services.

- The <insert jurisdiction> requires that the awarded vendor provide proof of payment of any subcontractors used for this project. Proposals shall include a plan by which the <insert jurisdiction> will be notified of such payments.
- Primary contractor shall not allow any subcontractor to commence work until all insurance required of subcontractor is obtained.

BUSINESS LICENSE

<Insert Jurisdiction> requires all businesses operating in the <insert jurisdiction> to pay a business license tax. In some cases the <insert jurisdiction> may require a regulatory permit and/or evidence of a State or Federal license. Prior to issuing a business license, certain business types will require the business license application and/or business location to be reviewed by the Development Services, Fire, Health, and/or Police Departments.

~~8.~~9. Cost

- N/A

~~9.~~10. Terms, Conditions and Exceptions

<***Insert*** project specific terms, conditions and exceptions>
To view an example, please reference section 9 of the City of Long Beach RFP No. PW12-016.

<***Insert*** individual public liability and insurance requirements for your agency>

Additional Resources - Sample evaluation criteria for scoring RFPs

1. Vendor Evaluation Criteria sample 1
2. SANDAG Criteria Used in Evaluating Proposals (simple version)
3. SANDAG Consultant Short List Evaluation Form (with weighting for scores)

EVSE Vendor Criteria Review

Your Municipality Name	Scoring Guideline	
	0	No information provided
	1	Poor
	2	Limited
Reviewer Name:	3	Adequate
Date:	4	Good
Vendor Name:	5	Excellent

Review Criteria	Score: 0 - 5	Notes
Current and past vendor performance in similar contracts with other local government agencies.		
Financial stability of the proposer as reflected in a certified financial statement or other certified statement, including but not limited to a Dun and Bradstreet financial rating.		
Rate structure and method of payment collection (i.e. the use of the main meter or sub meters).		
Maximum public benefit (in terms of affordability & customer support)		
Strength, quality, durability, advanced technology, future flexibility, and aesthetic appeal of proposed charging stations.		
Proposed maintenance, repair and replacement schedule including response times for malfunctioning equipment. (i.e. proposer's proximity to the City and number of proposer's employees performing maintenance functions).		
Possible commitment to providing additional charging stations at other City owned parking facilities (desirable but not required).		
Proposers marketing strategy		
Overall monetary return to the City (if applicable)		

Total Score: _____

CRITERIA USED IN EVALUATING PROPOSALS

(Version 1)

[PM to determine a weighted value for each evaluation criteria below] All proposals must be completed and convey all of the information requested in order to be considered responsive. The proposals then will be evaluated on the basis of the criteria listed below. The total number of points used to score this purchase order agreement is 100.

Criteria	Description	Points
Proposed method to accomplish the work	▪ Professional qualifications ▪ Relevant experience	_____
Project experience	▪ Nature, quality, and relevance of recently completed projects	_____
Staff Qualifications	▪ Unique qualification of key personnel	_____
Cost or Best Value	▪ Ranking of comparative costs among proposed firms, providing the best value for system and services offered	_____
Total		**100**

SAN DIEGO ASSOCIATION OF GOVERNMENTS (SANDAG)
CONSULTANT SHORT LIST EVALUATION FORM

Criteria	(a) Weight	(b) Score (0-10)	(a) x (b) Weighted Score
1. PROJECT TEAM ▪ Qualifications and relevant individual experience of staff assigned to this Project as presented in submitted proposal ▪ Unique qualifications, training, education certifications and licenses of staff assigned to this Project ▪ Experience conducting energy efficiency assessments for California governmental agencies ▪ Time commitment and availability of company staff assigned to this Project	3.0		
2. COMPANY PROJECT EXPERIENCE ▪ Proposer's demonstrated capability and experience of providing the services specified in the RFP for California public agencies ▪ Evaluated experience & technical competence as presented in proposal response ▪ Professional association membership, certifications, licenses, etc. ▪ Familiarity with State of California energy efficiency codes, regulations, rebates, incentives, initiatives and programs as presented in proposal response	3.0		
3. PROPOSED METHODOLOGY AND APPROACH TO WORK ▪ Quality and comprehensiveness of submitted proposal ▪ Demonstrated knowledge and experience of the Project services required ▪ Proposed Project approach and methodology tailored specifically to SANDAG's RFP project scope ▪ Innovative approaches or recommendations that SANDAG may not have specifically spelled out in the RFP ▪ Acceptance of the terms, conditions and requirements of SANDAG's RFP and Standard Services Agreement without exceptions.	4.0		
		Total	

SAN DIEGO ASSOCIATION OF GOVERNMENTS (SANDAG)

CONSULTANT INTERVIEW EVALUATION FORM

Criteria	(a) Weight	(b) Score (0-10)	(a) x (b) Weighted Score
1. COMPANY & ASSIGNED PROJECT TEAM EXPERIENCE & QUALIFICATIONS • Proposer's demonstrated capability and experience of providing the services specified in the RFP for California public agencies • Evaluated company & staff experience & technical competence • Professional association membership, certifications, licenses, etc. • Demonstrated knowledge and experience of the Project services required • Approach and proposed methodology tailored specifically for SANDAG's project scope • Innovative approaches or recommendations that SANDAG may not have specifically spelled out in the RFP • Qualifications and relevant individual experience, education, licenses, certifications and training of staff assigned to this Project as presented in submitted proposal	3.0		
2. COST (BEST VALUE) • Reasonableness of proposed costs in relation to other offers • Proposed pricing in relation to evaluated company experience, qualifications and services offered	3.0		
3. INTERVIEW QUESTIONS • Demonstrated knowledge of the work required • Quality of responses to interview questions	3.0		
4. REFERENCES • Record of experience providing quality product and services on similar projects on time and within budget	1.0		
		Total	

SAN DIEGO ASSOCIATION OF GOVERNMENTS (SANDAG)

CONSULTANT SHORT LIST EVALUATION WITH NO INTERVIEWS FORM

Criteria	(a) Weight	(b) Score (0-10)	(a) x (b) Weighted Score
1. PROJECT TEAM ▪ Qualifications and relevant individual experience of staff assigned to this Project as presented in submitted proposal ▪ Unique qualifications, training, education certifications and licenses of staff assigned to this Project ▪ Experience conducting energy efficiency assessments for California governmental agencies • Time commitment and availability of company	2.0		
2. COMPANY PROJECT EXPERIENCE ▪ Proposer's demonstrated capability and experience of providing the services specified in the RFP for California public agencies ▪ Evaluated experience & technical competence as presented in proposal response ▪ Professional association membership, certifications, licenses, etc. • Familiarity with State of California energy efficiency codes, regulations, rebates, incentives, initiatives and programs as presented in proposal response	2.0		
3. PROPOSED METHODOLOGY AND APPROACH TO WORK ▪ Quality and comprehensiveness of submitted proposal ▪ Demonstrated knowledge and experience of the Project services required ▪ Proposed Project approach and methodology tailored specifically to SANDAG's RFP project scope ▪ Innovative approaches or recommendations that SANDAG may not have specifically spelled out in the RFP • Acceptance of the terms, conditions and requirements of SANDAG's RFP and Standard Services Agreement without exceptions	2.0		
5. COST OR BEST VALUE • Reasonableness of proposed costs in relation to other offers • Proposed pricing in relation to evaluated company experience, qualifications and services offered	3.0		
6. REFERENCES • Record of experience providing quality product and services on similar projects on time and within budget	1.0		
		Total	

Regional Planning for Siting Public EVSE

Introduction

Through the EV Project, regional modeling to identify optimal locations to site publicly available electric vehicle supply equipment (EVSE) was undertaken in 2009-2010. Several REVI members participated in the EV Project's Stakeholder Advisory Committee and provided direction on a land use suitability model. SANDAG developed a visual and interactive version of the model using the Community Viz geographic information systems (GIS) application. Ecotality, as manager of the EV Project, utilized this regional planning approach and model results as a jumping off point to undertake site assessments and outreach to potential optimum EVSE host sites. This report provides an overview of this regional planning effort.

With a heavy reliance on the EV Project for a significant portion of the EV infrastructure development in 2010-2012, the Stakeholder Committee's primary and secondary goals were to:

1. Enable study of infrastructure deployment and driver behavior, to learn lessons from this study and refine the EV infrastructure deployment methodology.
2. Place EV Project EVSEs in locations that will serve as the foundation of a rich charging network for all future PEV drivers, where this goal does not conflict with the primary strategic goal.

At the time this modeling began, the Nissan LEAF had not been released yet and this was the first time planning for public EVSE had taken place since the EV1 in the 1990s. A primary purpose of the EV Project was to establish the public infrastructure necessary to provide a level of confidence to consumers that plug-in electric vehicles were a reality and could be used as everyday cars.

As more car manufacturers release PEVs each year, home and workplace charging are expected to be the primary places for PEV charging. Thus far, significant federal and state investment in EVSE has been focused on establishing robust public charging networks to address real and perceived range anxiety concerns.

Across the country, approaches for establishing public EVSE have varied. The San Diego region applied a modeling approach based on our land use and transportation network. The intent was to create a robust public EVSE network to meet near term EV Project goals as well as the long term EV needs for charging stations across the region.

The REVI should consider possible further uses for this model, such as:

- Producing maps by sub-region or jurisdiction to identify potential publicly accessible EVSE.
- Factors in the model could be re-scored as needed based on lessons learned and to serve this next phase of public EVSE siting.
- Factors could be weighted differently to identify optimal public EVSE sites for other priority areas like transportation corridors, smart growth areas, employment areas, or other criteria.

The Participants: EV Project Stakeholder Advisory Committee

As part of the EV Project, Ecotality formed a local stakeholder group comprised of public and private entities in the San Diego region. The EV Project Stakeholder Advisory Committee (ESAC) was to help guide EV infrastructure planning efforts, with the intent to ensure that EV charging needs are identified and met with the unique characteristics of San Diego in clear focus.

Through review of materials for, and participation in, 20 working group meetings of 1-2 hours and one half-day interactive workshop, ESAC members developed a strong working knowledge of PEV ranges, battery recharge times with various levels of EVSE charging, factors (such as temperature, terrain, driving behavior, etc.) that affect PEV performance, PEV consumer demographics, and electric utility rate structures. The ESAC was provided with summary information of the latest academic studies on PEV charging perceptions and behavior, to further inform their modeling choices.

EV Project Stakeholder Advisory Committee Members	
City of Chula Vista	CleanTECH San Diego
City of Escondido	Miramar College
City of La Mesa	California Center for Sustainable Energy
City of Oceanside	Port of San Diego
City of Poway	Qualcomm
City of San Diego	SANDAG (San Diego Association of Governments)
City of Santee	SDG&E (San Diego Gas & Electric)
County of San Diego	SDSU (San Diego State University)
ECONA	UC Davis ITS, Plug-in Hybrid & Electric Vehicle Center
Nissan	UCSD (University of California at San Diego)

Model Development

STAGE 1

First, the ESAC members were provided a spreadsheet listing the land use categories (as defined in municipal planning) to be scored from 1 to 5. A sampling of the 102 land use categories and a land use definition sheet are provided for reference as **Attachments 1 and 2** to this report. ESAC members were to assign a value to each land use based on the following factors.

FACTORS FOR HOSTING LEVEL 2 AND DC FAST CHARGE EVSE
Could a high number of users take advantage of this site? • Integrated into daily life • Available to many different users (takes account of any restrictions like employee only use, etc.)
Is there an appropriate amount of vehicle turnover for the type of charger? • Level 2: vehicle stay times of one to four hours • DC fast charge: vehicle stay times of five minutes to thirty minutes
What is the daily and weekly availability of the site? • Maximize the number of open days per week & per year (taking account of seasonality) • Maximize the number of open hours per day

STAGE 2

Next, the values assigned by each ESAC member were aggregated into group data and averaged. SANDAG analysts applied these scores to "Master Geographic Reference Areas" (MGRAs), which are the base units of geography for this model and most SANDAG applications. MGRAs are roughly the size of census blocks in urban and suburban areas, and census block groups in rural areas. They are delineated in a way to preserve the contiguity of trip producing and attracting land uses.[1]

The ESAC reconvened to discuss and clarify the overall score results. The final agreed upon scores for each land use category were then used in the regional modeling and Community Viz application. The purpose was to identify the most suitable land uses for hosting Level 2 EVSE and DC fast charge EVSE.

STAGE 3

In addition to scoring generic land use categories based on their suitability to host EVSE (see factors table above), location-specific factors were included. Land use category scores were multiplied by a standardized average daily traffic score for the road that serves the specific sites. If a site was within a major activity center or employment area, the major activity center / standardized employment area score was added to the average daily traffic score before being multiplied by the land use score. The definition used for each of these factors is provided in the following table of model considerations.

[1] Master Geographic Reference Area (MGRA) is the base unit of geography for this model and is a proprietary data unit designed and used by SANDAG. MGRAs are designed to nest to larger standard geographies such as census tracts, zip codes, and municipal boundaries.

MODEL CONSIDERATIONS	
Traffic Patterns	Significant study has already been completed on identifying traffic flows and patterns on major freeways. What is useful in identifying potential sites for publicly available EV charging infrastructure are where trips are attracted to in the greatest numbers—regional attractors. Vehicle trips points can be broken into trip origination points, typically residential areas, and trip destinations. Uses that draw trips from all over the region are regional attractors, and one type of regional attractor is an employment center, which is described in more detail in the next sub-section. Other regional attractors include retail and entertainment districts, along with recreation areas and multi-modal transportation hubs.
Land Uses	Land use categories, 102 in total, were used as the potential targets for EVSE placement. The land use categories generally correspond to underlying municipal zoning designations and covered all possible uses in the region, such as airports, beach, park and ride lots, hotel, regional shopping centers, specialty retail, and many others. The land use category data is maintained by SANDAG, through periodic updating with local municipalities and the County of San Diego in the San Diego region.
Trip Attractors	Trip attraction refers to the destination point of a trip in the trip generation model. Each trip has two trip "ends" (i.e. a beginning point and a destination point) and the trip generation model calculates trip ends separately. One end is classified as a trip attraction (i.e. the destination, or end point of the trip). For example, the home end of home-based trips is defined as the production end and the work location is defined as the attraction end. Shopping centers, recreation facilities, and work locations are all trip "attractors" upon which the attraction weight is based for modeling purposes. This bifurcation of trip ends and subsequent focus on destinations allows for a quick initial screening out of all trip origination locations, and for the development of a trip attraction weight based on the volume of trips attracted.
Employment Centers	Employment center refers to the number of jobs in the zone that the land use is located in, and implies a nearby day-time population. Employment data was not disaggregated by job classification (e.g. service, retail, industrial, etc.); rather it reflects aggregated job counts. Employment centers were first defined on a binary scale as MGRAs with more than twice the employment density of the study area mean. Then, the remaining areas were standardized on the number of jobs in the area.
Regional Attractors	Regional attractors refer to those areas or locations that have historically attracted trips from a broad area across the San Diego region. Specifically, regional attractors often attract trips from greater distances than other locations or areas. All regional attractors with qualifying land uses (those ranked highest in the land use suitability analysis described in detail later) were mapped.
Smart Growth Areas	Smart growth areas refer to areas mapped by SANDAG, as part of the 2008 Smart Growth Concept Map update. The areas reflect existing, planned or potential locations for smart growth that can be characterized as typically more compact higher density areas that are typically walkable and near public transit. The areas were identified by SANDAG through extensive outreach with and input from the municipalities and communities where the areas are located. These areas will see future development investment and remain or develop as vital areas within the many communities in the San Diego region, and for that reason are seen as important possible locations for public EV charging.

STAGE 4

During subsequent ESAC meetings, members were better informed of transportation and land use characteristics that SANDAG uses to accurately model and/or assess sub-regional transportation projects. One more level of weighting was then discussed and utilized to better identify optimal EVSE host sites. ESAC members were asked to weight some of these scores like the importance of trip attractors, employment centers or major regional destinations (attractors). **Attachment 3** shows the factors that the ESAC applied weighting to for determining optimal Level 2 and DC fast charge EVSE sites.

STAGE 5

SANDAG analysts prepared GIS layers showing which MGRAs scored well to effectively develop EVSE Optimization models for both Level 2 and DCFC EVSEs. SANDAG used the Community Viz GIS application to portray the data. Maps of optimum sites were created with ¼ mile diameter location boundaries yielding approximately 400 – 500 locations.

Model review occurred over approximately one month. Many ESAC organizations sought input and review from multiple departments/units, leveraging areas of expertise, such as transportation facility planning, electric distribution system planning, and land use planning, amongst others.

Raw scores were normalized and broken down into three main categories – highly probable (well above average), probable (above average), and average/below average. Only MGRAs in the top two categories were mapped as potentially optimal locations for EVSE. A series of region-wide and sub-regional maps were prepared for the EV Project and are listed below. A sample map is included as **Attachment 4**.

Maps Produced	
Region-wide Maps	Potential Locations AC Level 2
	Potential Locations DCFCs
	Potential Locations Regional Attractor Focus
	Potential Locations Employment Focus
Aerial imagery Level 2 EV Chargers and DCFCs	Central East San Diego Region
	Central San Diego North
	Central San Diego South
	East San Diego Region
	Northeast San Diego Region
	Northwest San Diego Region
	South San Diego Region

Conclusion

The REVI should consider possible further uses for this model, and other mechanism to inform regional planning for publicly available EVSE in the near and long term. The original purpose of this modeling effort was to aid the EV Project in its development of public EVSE infrastructure for the San Diego region. Ecotality was able to use the results as a jumping off point to undertake site assessments and outreach to potential optimal EVSE host sites.

Data used in this planning effort for the EV Project is retained by SANDAG to enable further use by SANDAG and its member agencies. One exception is the data used in Electric Utility Grid Capacity analysis, which is retained exclusively by SDG&E. SANDAG can provide the modeling results, maps, and other relevant information on request.

Sample Land Use Categories

Agenda Item 7A, Attachment 1

Instructions:

ESAC members are asked to score each land use description, detailed land use descriptions are provided in the land use document.

Scores should be between 1 and 5 with 5 being the best; use whole numbers only.

Score each use on each factor on a 1-5 Likert scale, with 5 being the best

Land Use Code	Brief Description	Daily hours availability	Avg stays 1h-3h	Available to many users	Availability throughout year	Total	For DCFC Avg stays 5m-30m
5002	REGIONAL SHOPPING CENTERS					0	
5003	COMMUNITY SHOPPING CENTERS					0	
5004	NEIGHBORHOOD SHOPPING CENTERS					0	
5005	SPECIALTY COMMERCIAL					0	
5006	AUTOMOBILE DEALERSHIPS					0	
5007	STORE-FRONT COMMERCIAL					0	
5008	SERVICE STATION					0	
5009	OTHER RETAIL TRADE AND STRIP COMMERCIAL					0	
6001	OFFICE-HIGH RISE					0	
6002	OFFICE-LOW RISE					0	
6003	GOVERNMENT OFFICE/CIVIC CENTERS					0	
6102	RELIGIOUS FACILITIES					0	
6103	LIBRARIES					0	
6104	POST OFFICES					0	
6105	~~FIRE/POLICE STATIONS~~					0	
6109	OTHER PUBLIC SERVICES					0	
6501	UCSD VA HOSPITALS BALBOA HOSPITAL					0	
6502	HOSPITALS-GENERAL					0	
6509	OTHER HEALTH CARE					0	
6800	~~SCHOOLS~~					0	
6801	SDSU SMSU UCSD					0	
6802	OTHER UNIVERSITIES AND COLLEGES					0	
6803	JUNIOR COLLEGES					0	
6804	SENIOR HIGH SCHOOLS					0	
6805	JUNIOR HIGH SCHOOLS AND MIDDLE SCHOOLS					0	
6806	ELEMENTARY SCHOOLS					0	
6807	SCHOOL DISTRICT OFFICES					0	

EXAMPLES OF LAND USE CATEGORIES AND DEFINITIONS

1500 HOTEL/MOTEL/RESORT

1501 HOTEL/MOTEL (LOW-RISE) – Hotels, motels, and other transient accommodations with three or less floors. Commonly found along freeways and prime commercial areas.

1502 HOTEL/MOTEL (HIGH-RISE) – Hotels and motels that have four or more floors. Primarily found in downtown areas and near tourist attractions.

1503 RESORT – Resorts with hotel accommodations that usually contain recreation areas. Examples of resorts would be La Costa Health Spa, Lawrence Welk and the Olympic Resort in Carlsbad near the airport.

2100 LIGHT INDUSTRY

2101 INDUSTRIAL PARK – Office/industrial uses clustered into a center. The primary uses are industrial but may include high percentages of other uses in service or retail activities.

2103 LIGHT INDUSTRY-GENERAL – All other industrial uses and manufacturing not included in the categories above. These are not located inside of parks, but are usually along major streets or clustered in certain areas. Includes manufacturing uses such as lumber, furniture, paper, rubber, stone, clay, and glass; as well as light industrial uses as auto repair services and recycling centers. Mixed commercial and office uses (if not large enough to be identified separately) are also included. General industrial areas are comprised of 75 percent or more of industrial uses (manufacturing, warehousing, and wholesale trade).

4100 AIRPORTS

4101 COMMERCIAL AIRPORT – Lindbergh Field only.

4102 MILITARY AIRPORT – Airports owned and operated by the military. Found on Military bases.

4103 GENERAL AVIATION AIRPORT – All general aviation airports.

4110 OTHER TRANSPORTATION

4111 RAIL STATION/TRANSIT CENTER/SEAPORT – Major transit centers (e.g. Oceanside Transit Center, El Cajon Transit Center), rail stations (e.g. Santa Fe Depot, Solana Beach Station), Coaster stations

(Oceanside, Carlsbad Village, Carlsbad Poinsettia, Encinitas, Solana Beach, Sorrento Valley, Old Town, San Diego), major trolley stations, and seaport terminals (Port of SD). Parking areas associated with these uses are included. Transit centers within shopping centers are included within the shopping center category.

4114 PARKING LOT-SURFACE – All surface parking lots not associated with another land use.

4115 PARKING LOT-STRUCTURE – All large parking structures not associated with another land use.

4116 PARK AND RIDE LOT – Stand-alone parking areas that are not associated with any land use. These are usually located near freeways.

5000 COMMERCIAL

5002 REGIONAL SHOPPING CENTER – Contain one to five major department stores, and usually have more than 50 tenants. Typically are larger than 40 acres in size.

5003 COMMUNITY SHOPPING CENTER – Smaller in size than the regional shopping centers. Contain a junior department store or variety store (i.e. a Target Center with other commercial stores) as a major tenant and have 15 to 50 other tenants. Smaller in size, 8 to 20 acres. May also have a variety store (i.e. Target, Home Depot or Price/Costco) by itself.

5004 NEIGHBORHOOD SHOPPING CENTER – Usually less than 10 acres in size with on-site parking. Includes supermarket and drug store centers not identified as community commercial. May include office uses that are not large enough to code separately. Neighborhood centers with over 100,000 sq. ft. are inventoried by the Chamber of Commerce, and The Union Tribune (Copley) also collects data on neighborhood centers.

5005 SPECIALTY COMMERCIAL – Tourist or specialty commercial shopping areas such as Seaport Village, Marina Village, Ferry Landing at Coronado, Bazaar del Mundo, Flower Hill, Glasshouse Square, The Lumberyard, Park Plaza at the Village, Promenade, Belmont Park, Del Mar Plaza.

Model 2: Land Use Characteristic Weighting

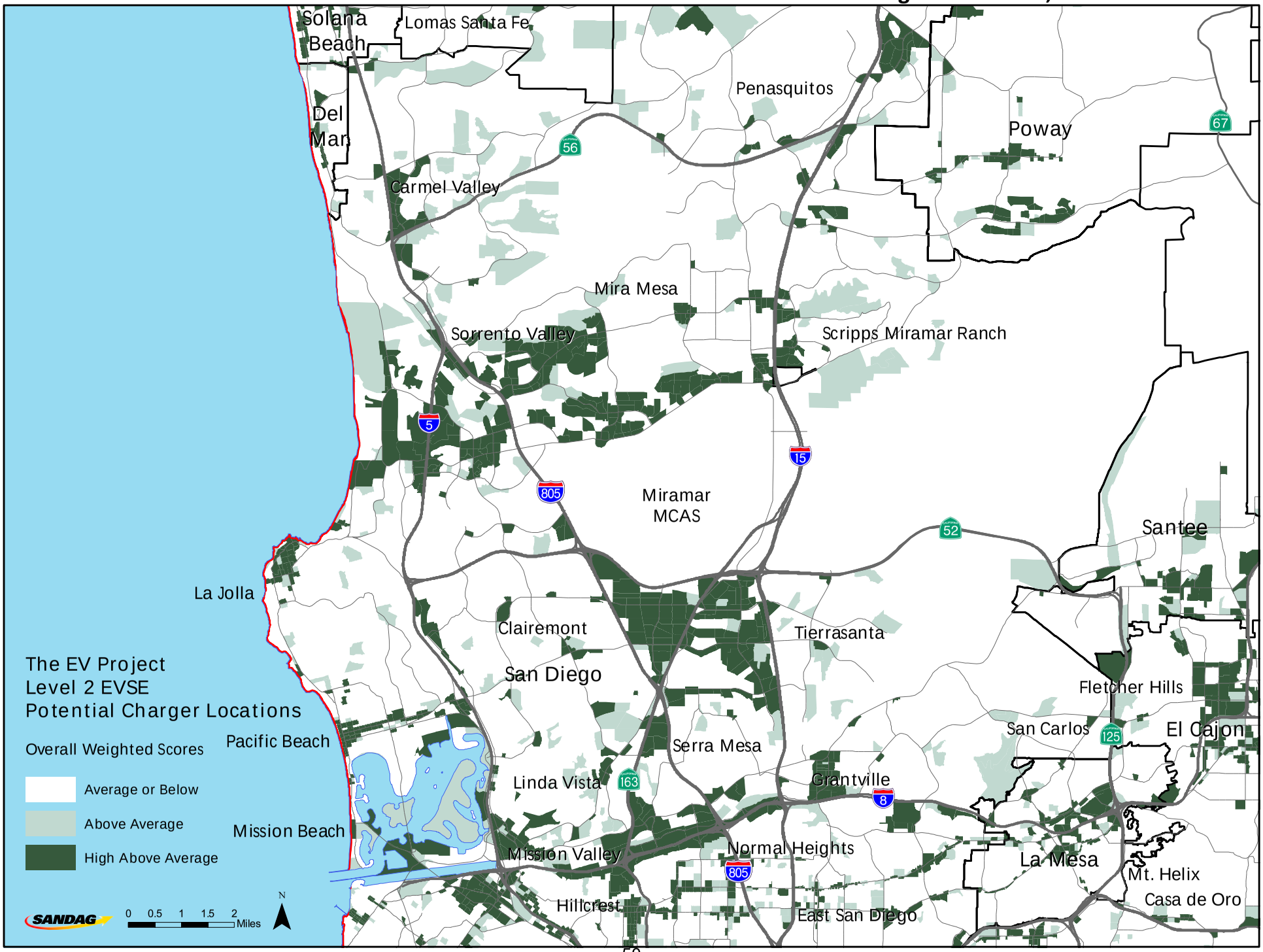
Scores should be between 1 and 5 with 5 being the best; use whole numbers only.

Level 2 EVSE Site Characteristic Weights:

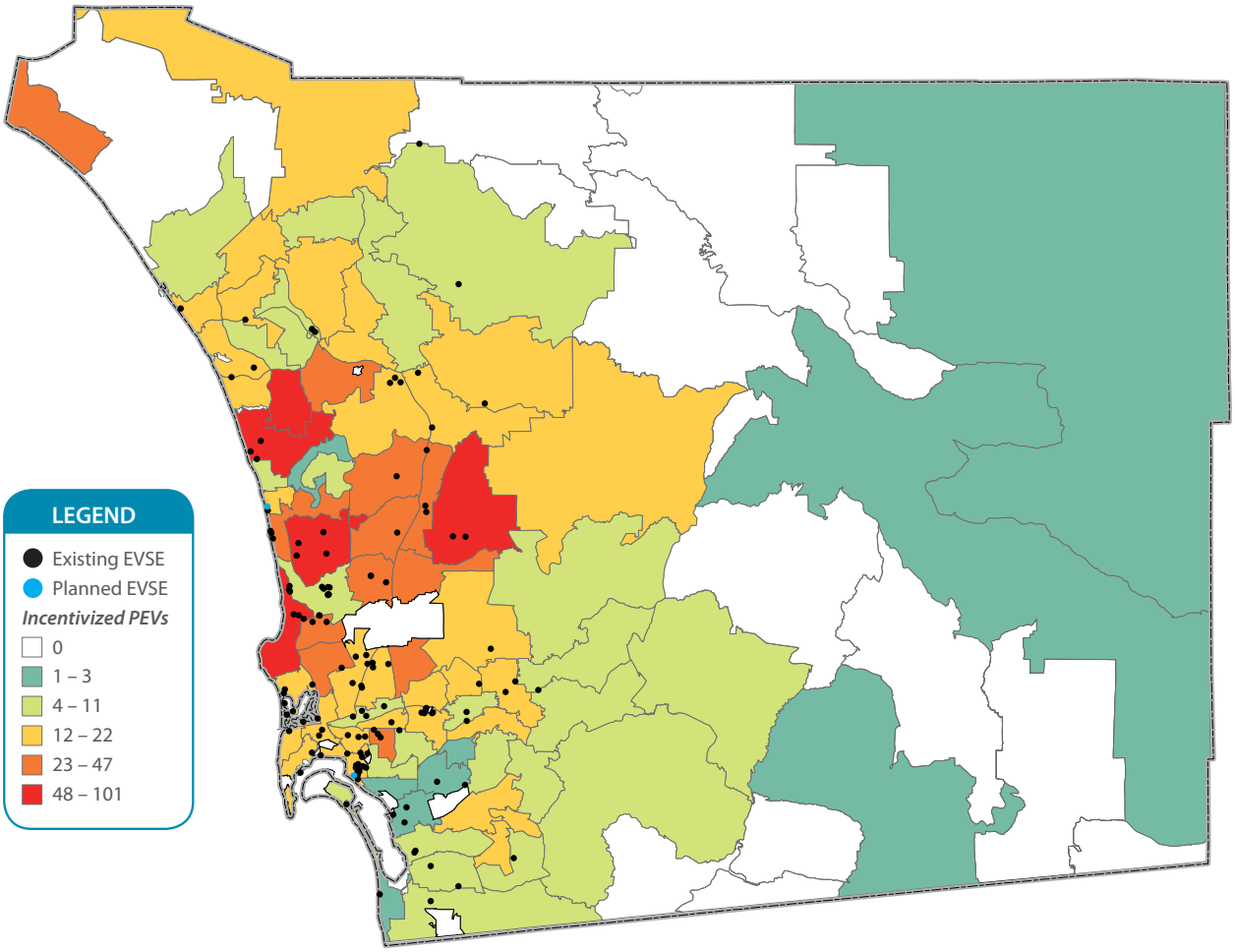
	Daily hours availability	Avg stays 1h-3h	Available to many users	Availability throughout year	In an Employment Center	Trip Generation
Weight	3.00	3.83	3.50	4.17	3.83	3.17

DC Fast Charger Site Characteristic Weights:

	Daily hours availability	Avg stays 45m-3h	Available to many users	Availability throughout year	In an Employment Center	Trip Generation
Weight	4.17	3.67	3.83	4.33	2.17	3.67


Solana Beach
Lomas Santa Fe
Del Mar
Penasquitos
Poway
Carmel Valley
Mira Mesa
Sorrento Valley
Scripps Miramar Ranch
Miramar MCAS
Santee
La Jolla
Clairemont
Tierrasanta
San Diego
Fletcher Hills
San Carlos
El Cajon
Pacific Beach
Serra Mesa
Linda Vista
Grantville
Mission Beach
Mission Valley
Normal Heights
La Mesa
Mt. Helix
Casa de Oro
Hillcrest
East San Diego
The EV Project
Level 2 EVSE
Potential Charger Locations
Overall Weighted Scores
Average or Below
Above Average
High Above Average
SANDAG
0 0.5 1 1.5 2 Miles
N

San Diego Regional Public Charging Station Locations



This map indicates the existing and planned public charging stations available in the San Diego region. With the exception of the DC fast charging station located in Santa Ysabel in eastern San Diego County, all of the stations identified are Level 2 EVSE. Additionally, the map provides the distribution of PEVs throughout the region by zip code utilizing data from the CVRP.

In the second phase of this project, as part of the San Diego regional PEV readiness plan, REVI and additional stakeholders throughout the region will be developing a more thorough regional charge port infrastructure plan. This plan will identify location quantity and investment required to install necessary infrastructure beginning in 2014, including a map of proposed infrastructure sites and a timeline for infrastructure deployment.

Business and Regional Public Agency Motivations to Provide Charging Infrastructure

Through our current PEV planning efforts, collaborations with the EV Project and research efforts, CCSE has developed an understanding about the role of nonresidential charging infrastructure in PEV deployment. CCSE is in the process of completing a study on the value proposition to local businesses and public agencies that invest in EVSE. While this study has not been finalized, some initial results are presented here to inform PEV planning in the San Diego region. The complete report will be available in early 2013.

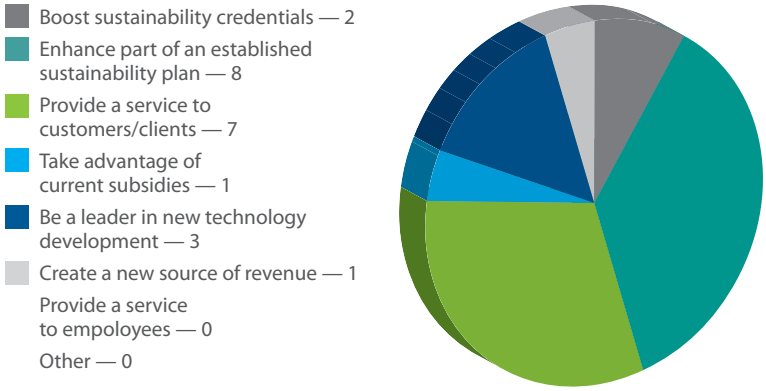
The study included a phone survey (conducted between May and September 2012) of businesses, public agencies and institutions that have installed Level 2 EVSE in San

Diego County within the last two years. CCSE surveyed 22 of the 43 institutions in San Diego County that have installed public and workplace charging stations.

Motivation to Install EVSE

Based on our survey of institutions that have installed EVSE in San Diego County, sustainability considerations and customer service appear to be the main drivers for early adoption of EVSE. The survey respondents were asked to identify the primary reason the institution decided to invest in EVSE. Of the 22 respondents, eight indicated that an existing sustainability plan was the main driver of EVSE adoption, and another two decided to invest in EVSE in order to boost the institution's sustainability credentials, though not as part of an established plan.

Motivation to Install EVSE



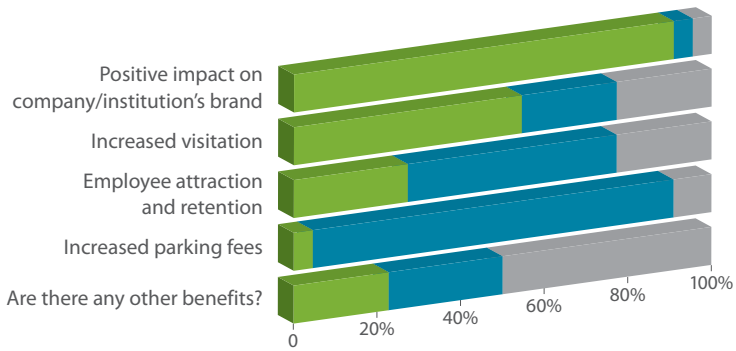
Responses to "What was the primary reason that the company/institution decided to invest in electric vehicle supply equipment (EVSE)?"

Perceived Benefits of Installing EVSE

CCSE also asked survey respondents if the company or institution expects any additional benefits beyond direct revenue from user fees because of hosting the EVSE. Almost all respondents indicated that hosting charging infrastructure would provide a positive impact on their institutions' brand. Increased visitation was seen as a benefit for over half of the respondents, and less than a third of respondents indicated that employee retention was a benefit provided by the EVSE investment.

CCSE's survey indicates that early adopters of EVSE have been primarily driven by a desire to enhance sustainability credentials or provide a service to customers. In addition to the results presented here, the complete report explores the financial and economic relationship associated with installing and maintaining public PEV charging stations. This research is critical to educating prospective public charging station hosts. The final report will be utilized by REVI in the continued efforts to promote EVSE deployment in the region.

Expected EVSE Results



Responses to "Does the company or institution expect any of the following benefits as a result of investing in electric vehicle supply equipment"