PEV Coordinating Council San Joaquin Valley

California Energy Commission
San Joaquin Valley Air Pollution Control District

San Joaquin Valley Plug-In Electric Vehicle Coordinating Council

Date: Thursday, April 4, 2013
Time: 10:00 a.m. – 12:00 p.m.
Location: SJVAPCD Fresno Office
1990 E. Gettysburg Ave.
Fresno, CA 93726

Teleconference information: Call-in: 646-364-1285 Access Code: 6619701

Video Teleconferencing at the following locations:

Modesto	Bakersfield
4800 Enterprise Way	34946 Flyover Court
Modesto, CA 95356	Bakersfield, CA 93308

April 4, 2013 Meeting Agenda (+ next to an item indicates an attachment)

1. Welcome and Introductions (Nhia Vu, SJVAPCD)

2. Announcements and Public Comments (All)

+3. Summary of March 7, 2013 Meeting (Jessica Thoma, CCSE)
   A. Updated PEVCC Goals

   B. Training and Education for Municipal Staff and Electrical Contractors
      - Review of the compiled recommendations that were provided for PEV training and education, and PEV education and outreach avenues
      - Review of Climate Action Plan & Sustainability Action Plan document

   C. Lack of Public Knowledge of PEV and EVSE
      - PEVCC to review draft presentation and provide feedback

+4. Regional PEV Readiness Plan Development (SJVPEVCC members and Tyler Petersen, CCSE)
   A. Permitting/Inspection
      - Review *San Joaquin Valley Readiness Assessment* Results and Recommendations
      - Review Residential Permit and Inspection Template
      - SJV PEVCC Member Feedback and Discussion

   B. PEV Charging – TOU Utility Rates and Grid Impacts
      - Southern California Edison presentation
      - City of Lodi Electric Utility presentation

+5. Barrier topics for May 2, 2013 Meeting (SJVPEVCC members and Tyler Petersen, CCSE)
   A. Workplace Charging
   B. Updating Building Codes for EVSE

The next SJV PEVCC meeting will take place on **May 2, 2013 from 10:00 a.m. - 12:00 p.m.**

San Joaquin Valley Plug-in Electric Vehicle Coordinating Council

March 7, 2013 MEETING SUMMARY

ATTENDEES:

Video Teleconference (VTC): Fresno (Central), Modesto (North) and Bakersfield (South)

Central Office Attendees:					
CCSE	**CCSE**	**City of Clovis**	**City of Fresno**	**Fresno COG**	
Tyler Petersen	Jessica Thoma	Kendall Cook	Joseph Oldham	Lauren Dawson	
Fresno County	**Merced County**	**PG&E**	**SJVAPCD**	**SJVAPCD**	
Bernard Jimenez	Jeff Fugelsang	Bob Riding	Nhia Vu	Colette Kincaid	
SJVAPCD	**SJVAPCD**	**SJVAPCD**	**SJV Clean Energy Organization**		**City of Visalia**
Juan Cano	Todd Deyoung	Lisa Van de Water	Courtney Kalashian		Betsy Garcia

North Office Attendees:
City of Stockton
David Stagnaro

South Office Attendees:
SJV Clean Cities/Kern COG
Linda Urata

Conference Call Attendees:			
Charge Point	**Tulare County Association of Governments**	**Turlock Irrigation District**	**City of Lodi Electric Utility**
Kumar Gogineni	Elizabeth Wright	Chris Poley	Rob Lechner

San Joaquin Valley Plug-in Electric Vehicle Coordinating Council

Agenda Notes:

ITEM #1: WELCOME AND INTRODUCTIONS
Nhia Vu, San Joaquin Valley Air Pollution Control District (SJVAPCD), welcomed the group to the second San Joaquin Valley Plug-in Electric Vehicle Coordinating Council (SJVPEVCC) meeting. Ms. Vu opened up the meeting for introductions for all attendees on the phone as well as those at the Fresno, Modesto and Bakersfield District offices.

ITEM #2: ANNOUNCMENTS AND PUBLIC COMMENTS
There were no announcements or public comments.

ITEM #3: SUMMARY OF FEBRUARY 7, 2013 MEETING
Jessica Thoma, California Center for Sustainable Energy (CCSE), announced that all meeting agendas and summaries can be found on the *Plug-in & Get Ready* website: www.energycenter.org/pluginready. During the February 7, 2013 meeting, each participant was asked to review a list of 12 identified barriers and vote for their top three. The responses were added up and a scoring metric was created. A #1 vote received three points, a #2 vote received two points and a #3 vote received one point. The three highest scoring barriers and their associated scores are identified in the table below:

Ranking	Barrier	# of Total Votes Received	Total Score
1.	Lack of Public Knowledge of PEV and EVSE	11	27
2.	Zoning and Parking Rules	10	21
3.	Training and Education for Municipal Staff and Electrical Contractors	5	9

Ms. Thoma announced that the barrier list provided in the agenda packet has been reorganized to reflect the barriers in their new order of priority based on the group's votes. Ms. Thoma asked the coordinating council for feedback on the meeting summary and asked for comments or questions regarding the scoring mechanism used to prioritize the barriers. Chris Poley, Turlock Irrigation District, noted that the summary incorrectly referred to Queta Maldonado as a "he". Additionally, Mr. Poley wanted to make note that during the February meeting, both he and Ms. Moldonado highlighted the importance of the utility and time-of-use (TOU) barrier (barrier 8) and would like that noted in the summary. Jeff Fugelsang, Merced County, announced that he had emailed Tyler Petersen, CCSE, with corrections to his recorded statement regarding CEQA exemptions and to reflect this in the meeting summary. Ms. Thoma announced that for future meetings, corrections like those identified by Mr. Fugelsang and Mr. Poley are welcome during this portion of the agenda. Any mistakes recognized will be corrected and the revised meeting summary will be posted to the *Plug-in & Get Ready* website.

The information provided on the *Plug-in & Get Ready* website is specific information for the San Joaquin Valley and San Diego region. There are other regions working on similar PEV coordinating councils but that information is not available on the *Plug-in & Get Ready* website. Colette Kincaid, SJVAPCD, announced that the California Energy Commission (CEC) is currently working on creating one source where information on all the regional coordinating councils can be publically accessed. Once this source has been identified, the group will be notified.

San Joaquin Valley Plug-in Electric Vehicle Coordinating Council

During the February 7, 2013 meeting, the group was asked to review the coordinating council goals. Feedback regarding goal number two was provided and CCSE and the SJVAPCD have revised the language which the group was asked to re-review.

PEVCC members provided the following comments:

- Linda Urata, SJV Clean Cities Coalition/Kern COG, stated that, "local government" should be made plural. Betsy Garcia, City of Visalia, added that the group has the intention of targeting not only regional land-use plans but local land-use plans.
- Joseph Oldham, City of Fresno, stated that it is easier to incorporate changes into a Climate Action Plan (CAP) as opposed to a General Plan; and it would be best to identify the CAP instead of the General Plan to promote EVSE and PEV-friendly policies.

The requested changes will be made and the revised goal will be brought back to the group during the April meeting for review.

ITEM #4: REGIONAL PEV READINESS PLAN DEVELOPMENT

a. PEV Zoning and Parking Rules

Mr. Petersen, directed the group to the San Joaquin Valley readiness assessment recommendations for PEV Zoning and Parking Rules which was provided in the agenda packet. The readiness assessment identified three recommendations to help resolve the PEV Zoning and Parking Rules:

1. Implement consistent general service and regulatory signage for PEVs throughout the San Joaquin Valley
2. Update municipal zoning language for dedicated PEV parking based on PEV market growth
3. Establish regional EVSE parking accessibility guidelines

PEVCC members provided the following comments:

- Dave Stagnaro, City of Stockton, stated that consistent the signage throughout the state and the region is critical. Mr. Stagnaro added that in order to update municipal code language, a specific protocol that must be followed. Mr. Oldham stated the City of Fresno's process to update a municipal code is similar to that of the City of Stockton. Once a change has been made to the municipal code, it must be approved by the City Council which is subject to numerous deliberations. With the lack of community knowledge of PEV's, Mr. Oldham stated that the signage discussion is premature. Prior to presenting specific code changes, the community and elected officials need to be educated about electric vehicles (EV).

- Courtney Kalashian, SJV Clean Energy Organization, agreed with Mr. Oldham that education and outreach must happen before we attempt to proceed with implementing new codes. Ms. Kalashian added that it would be beneficial to engage smaller cities that may be willing to implement PEV-friendly codes without an exhaustive community review. She stated that the City of Woodlake, (population of 11,000) for example, has a motivated city council that may benefit from hearing about PEV policies and programs. If successful, implementation of PEV-friendly policies by a regional council

may generate momentum for larger scale regional efforts.

- Bernard Jimenez, Fresno County, supports consistency across jurisdictions and stated that any updates to Fresno County's ordinance code would follow a similar process that of the City of Stockton and City of Fresno. Mr. Jimenez clarified for the group that any updates to the Fresno County are referred as a county ordinance code, not a municipal ordinance code. Mr. Jimenez also announced that Fresno County permitted its first charging station in late 2012 and did not require PEV signage at the site.

- Mr. Fugelsang seconded Mr. Stagnaro's comment about statewide consistency. Mr. Fugelsang added that Merced County local officials are unaware of PEV technology and may benefit from having a presentation on the subject. Mr. Fugelsang also highlighted Mr. Jimenez's point regarding municipal zoning language. In a county, there is no municipal zoning code; it is referred to as the county code which will be updated when the general plan is adopted at the end of the year. With this in mind, it will be beneficial to incorporate any PEV-related codes in the latest revision the county will be making in the next few years. Mr. Fugelsang also commented that urban zoning, agricultural, industrial and commercial uses across the county may be interested in hosting EV infrastructure, and having consistency across counties will help expand the PEV market. According to Mr. Fugelsang, the west side of Merced county on Interstate 5, would not be ideal to install large PEV charging stations within existing urban boundaries, so the PEVCC should focus on the development of infrastructure off highway interchanges.

- Mr. Oldham stated that the amount of electric vehicles operating in the San Joaquin Valley is significant but the knowledge regarding the volume of vehicles is unknown to elected officials. In order to help support the growth of PEVs in the region, support from local officials is critical and officials will need to be informed about where the industry currently stands. In order to do this, it would be beneficial to have a presentation created that can be distributed to coordinating council members to highlights regional PEV adoption numbers and the PEVCC's work. Mr. Jimenez agreed with Mr. Oldham and stated that the board and staff for Fresno County would possibly accept a short informational presentation.

- Ms. Urata asked the cities and counties their opinion on the importance of consistent PEV parking ordinances and safety signage for private organizations as they are experiencing a great of interest from larger companies to invest in corporate fleets. Mr. Jimenez responded that the concern should not be focused on private parking but instead on standardizing signage for public parking since private locations won't be accessible to the entire public. Ms. Urata's inquiry posed the question of what constitutes public parking vs. private parking. Mr. Riding asked the group what would qualify as private parking or public that if a large retailer offered parking for its employees only. Mr. Jimenez answered that any parking that is accessible to the public, regardless if it is designated for employees or not is subject to ADA requirements. Ms. Urata followed up by stating that parking at mall and shopping districts are considered private. Lisa Van de Water, San Joaquin Valley Air Pollution Control District, notified the group that she previously worked in land-use planning for a city and even though there is a distinction between private and public parking, cities normally have specific design requirements that apply at the review process for companies developing on private land. It is common that the cities have specific design and signage standards and including these guidelines is common practice. Kumar Gogineni, Charge Point, stated that ADA requirements apply to all private lots, such as multi-unit dwellings. Mr. Fugelsang stated that the same signage standards for the county are applied

for both public and private property. Mr. Petersen notified the group that he would provide the group further information on the different requirements for public and private property.

- Ms. Garcia, stated that they would appreciate having standards developed so they can be prepared when a private company installing infrastructure requests feedback on signage. She further stated that it would be helpful to have this information ready to be provided upon request. While education and outreach is important, getting started laying the foundation for the signage and codes would be beneficial.

- Based on the feedback provided, Mr. Petersen suggested that a slideshow be created and distributed to the group for each member to utilize. This information will also include statistics on where PEV's are located throughout the San Joaquin Valley as this information is important to pass along to elected officials. Ms. Kincaid added that in an attempt to get the most accurate information, the CEC is working on gathering information about EV drivers from the DMV. Once this information is available, the final numbers will be distributed to the coordinating council.

- Mr. Riding announced that PG&E is assisting local governments in generating their Climate Action Plans by providing data identifying where PG&E customers on the E9 rate (EV rate) are located. This information can be converted into an illustration in order to see where vehicles are located. Additionally, this information can be compared to the data from the air district to determine how many customers applied for a rebate but are not on the E9 rate. Mr. Riding offered to collect this data and provide it to the group as a google map type illustration. Mr. Oldham agreed that this information would be helpful and highlighted that depending on the results, an educational campaign may be needed to make sure PEV owners are aware of the available cost saving utility rates.

- Mr. Fugelsang responded that there is too much emphasis on current EV owners and not enough concentration on future EV owners. He added that there aren't many EV drivers in Merced County because there is no infrastructure network in the region to support drivers. Mr. Fugelsang encouraged the group to not just look at where the vehicles are currently located but identify where future infrastructure will be needed. Mr. Riding agreed and added that when viewing current infrastructure, the group should also make the distinction between home charging versus public charging.

- Mr. Poley, Turlock Irrigation District, stated that the District does not offer a PEV rate for its customers. Mr. Poley echoed what Mr. Fugelsang stated because similar to Merced County, in their service territory, there aren't many current customers driving EVs. For this reason, it is important to plan and identify where the infrastructure will need be sited. There are two main corridors through Interstate and California State Road 99 that could serve as beneficial charging locations for drivers. Mr. Poley added that in order for the district to spend the money to create a PEV rate, more EV drivers are needed.

b. Lack of Public Knowledge of PEV and EVSE

Mr. Petersen directed the group to the San Joaquin Valley readiness assessment recommendations for Lack of Public Knowledge of PEV and EVSE which was provided in the agenda packet. The readiness assessment provided the following recommendations:

San Joaquin Valley Plug-in Electric Vehicle Coordinating Council

1. Develop PEV resources page on regional municipalities and municipally owned utility websites
2. Support, coordinate and expand existing PEV consumer education in the San Joaquin Valley
3. Promote PEV and EVSE incentives to local governments
4. Develop and implement PEV dealer education to San Joaquin Valley car dealerships
5. Create and distribute regionally focused EVSE installation consumer education materials

PEVCC members provided the following comments:

- Mr. Poley opened the conversation by stating that the focus needs to be adjusted to be less on current EV owners and more on the everyman who doesn't know anything about EVs but would be interested in learning about the technologies.

- Mr. Oldham announced to the group that the City of Fresno is doing a pilot effort called the Tune-Up Program. This program offers free energy efficiency audits to homeowners and small to medium sized businesses. A strong correlation has been discovered between renewables, energy efficiency and EV's. The program is now being designed that when an energy efficiency audit is completed, the customer will also receive an assessment of what an EV would do to their energy consumption with solar and without solar. Additionally, educational material such as the PG&E available EV rates will be provided to the customer. The goal is to develop a protocol that the PEVCC could replicate across the region. The Tune-Up Program is a two year project funded by PG&E for PG&E customers in Madera, Fresno, Kings, Tulare, and Kern County.

- Rob Lechner, City of Lodi Electric Utility, announced that on March 20, they will be proposing a PEV rate to the Lodi City Council. The purpose of designing this rate is to encourage EV owners to shift their charging to off-peak hours in order to reduce stress on the grid. Concurrently, the City of Lodi Electric Utility is also working with Clipper Creek (an EVSE vendor) to install seven public chargers. Lodi Electric is making the effort to have the PEV rate approved and infrastructure installed prior to beginning their marketing and outreach. The infrastructure is expected to be in place in the next two to four weeks. Currently there are only two EVs in the Lodi region so they felt it was important to complete the technical piece before they begin to communicate with the public. Mr. Petersen encouraged Mr. Lechner to make this information available to the group.

The participating members were asked to give their recommendations on possible education and outreach avenues. Based on the amount of specific information given during the meeting, Mr. Petersen informed the group that CCSE will compile this information for the group, which is summarized in the graph below:

Identified By:	Name:	Additional Notes:
SJV Clean Energy Org.	View Partnership (PG&E, SCE, Kings & Tulare)	
SJV Clean Energy Org.	CA Partnerships for San Joaquin Valley (private/public entity)	
Kern COG	Monthly Workshops Prior to Board Meeting Televised on KGOV	
Kern COG	Monthly Committee Meetings (e.g. transportation technical advisory)	

San Joaquin Valley Plug-in Electric Vehicle Coordinating Council

SJVAPCD	Board Meetings	
Kern COG/SJV Clean Cities Coalition	Kern Energy Watch Program	
Fresno COG	3 Monthly Meetings	Meetings include mayors, city managers and staff engineers
SJV Clean Energy Org.	Rural Development Center	
City of Visalia	SCE Education Coordinator	
SJV Clean Cities Coalition	Car Dealerships	It is the responsibility of the SJV Clean Cities but they currently don't have the resources. Need to coordinate with OEM regional representatives.
Tulare	Air Quality Grant Funds	

PEVCC members provided the following outreach and education recommendations:

- Elizabeth Wright, Tulare COG, stated that her organization was progressive in installing infrastructure for compressed natural gas (CNG) vehicles using SJVAPCD grant funds. Ms. Wright explained that this process was successful for CNG so they are hoping the same will happen for EVs.

- Mr. Oldham informed the group that he had seen motor week recently which focused on the firsthand experiences of EV owners. Mr. Oldham found this type of information extremely valuable and suggests reaching out to car clubs. Ms. Urata responded that the SJV Clean Cities Coalition partners with motor week and could provide the presentations to the group to be used as educational material. Additionally, there is a YouTube video that Clean Cities has develops which includes valuable PEV-related information. Ms. Urata agreed to share this all these resources with the group.

The topic of infrastructure siting and available funding was introduced. While there is not a single entity that selects the infrastructure siting, there are a few considerations that continually come into play (e.g. population, employment density, retail location, etc.). Mr. Petersen informed the group about the NRG/eVgo EV infrastructure settlement with the California Public Utilities Commission. eVgo, a NRG subsidiary, is scheduled to install approximately 2,000 make ready stations (prewiring for Level 2 charging) and 10-15 DC fast charging stations in the San Joaquin Valley. eVgo will be asked to present to the group once regional sales staff are hired. Mr. Petersen agreed to email the group with the link to the eVgo webpage where entities can sign up to receive a make ready site.

Ms. Vu also announced that the SJVAPCD will also be providing rebates for commercial and residential charging stations through the District's public grant program.

c. Training and Education for Municipal Staff and Electrical Contractors

Mr. Petersen directed the group to the San Joaquin Valley readiness assessment recommendations for EVSE Training & Education for Municipal Staff and Electrical Contractors which was provided in the agenda packet. The readiness assessment provided the following recommendations:

1. Implement at least two PEV readiness trainings for regional municipal staff

2. Leverage regional alternative fuel training funding to implement PEV infrastructure training for EVSE installers
3. Coordinate and expand DOE-funded safety training for emergency first responders in the San Joaquin Valley

Similar to the education and outreach conversation, many valuable recommendations were provided on ways to conduct training and education. The graph below summarizes this information:

Identified By:	Name:	Notes:
SJV Clean Energy Org.	Alternative Fueling Center/Alternative Fuel Automotive Training Program	Current program
Kern COG/SJV Clean Cities Coalition	CA Association of Building Officials	Current program
City of Fresno	BEC Training	Current program
PG&E	Mobile Technical Trainings	Potential program
City of Visalia	SCE Educational Coordinator	Potential program
City of Fresno	BEC Training	Potential program
SJV Clean Energy Org.	Rural Development Center	Potential program
SJVAPCD	Alternative Fuel Mechanical Training Program (Remove Program)	Current program
SJV Clean Cities Coalition	Car Dealerships	Potential program

PEVCC members provided the following comments:

- Mr. Fugelsang pointed out that training and education for municipal staff should occur after elected officials are presented with information on PEV technologies and the PEVCC. Until the elected officials are on board and understand the reasoning behind why this work is important, it will be difficult to move forward without their support.
- Ms. Garcia recommended that any training sessions be structured during a four hour period, with the first two hours dedicated to an overview of PEV-related policies and the second half focused on specific technical training. If this information is marketed properly, then attendees will have the option of attending either training. Mr. Stagnaro agreed with Ms. Garcia and added that to save costs, staff could record one training session and make available on a dedicated website for others to access at their leisure. Mr. Polly seconded Mr. Stagnaro's comment.
- Ms. Urata stated that any trainings and outreach should be targeted to a specific audience.

ITEM #5: BARRIER TOPICS FOR APRIL 4, 2013 MEETING

San Joaquin Valley Plug-in Electric Vehicle Coordinating Council

Mr. Petersen announced that the following barriers are on the agenda to be discussed at the April 4th meeting:

- Streamlining Permitting & Inspection of EVSE
- On Peak Charging – Time-of-Use Rates and Grid Impacts

Mr. Petersen asked the group if they would still like to move forward addressing the barriers in their order of priority. Ms. Kalashian suggested using the first 30 minutes of the next meeting cover what was discussed at today's meeting and proceed with the barriers identified next on the priority list. Mr. Fugelsang seconded this motion.

Ms. Kincaid reminded the group to please respond to the follow up email that will be sent out requesting that each member review the specific information documented today and provide any edits or additions. CCSE and SJVAPCD will then compile the responses into a single list of recommendations.

Mr. Petersen announced that the next meeting will be a similar structure to today's meeting. Recommendations will be provided from previous work that has been completed in order to streamline permitting and inspections for EVSE. New material, however, will be needed in order to discuss time-of-use rates and grid impacts so utility representatives will be contacted and encouraged to present during this portion of the meeting.

SJV PEVCC Goals

- Increase education and outreach to municipalities and consumers
- Conduct outreach to local governments to recommend integration of PEV and EVSE policies into local and regional transportation- and land use plans
- Provide tools and resources to assist counties, cities, and communities in the region become PEV ready
- Create and publish recommendations and best practices through on-line information sheets for Valley jurisdictions and consumers
- Communicate and coordinate regularly with surrounding regions regarding best practices and lessons learned

Training and Education

CURRENT PROGRAMS								
Identified By:	**Name:**	**Point of Contact:**	**Intended Audience:**	**Event Dates:**	**Funding Source:**	**Hosted By:**	**Location:**	**How does this benefit the PEVCC & Reduce Barriers?**
SJV Clean Energy Org.	Alternative Fueling Center/Alternative Fuel Automotive Training Program							
Kern COG/SJV Clean Cities Coalition	CA Association of Building Officials							
City of Fresno	BEC Training		Building Officials					

Training and Education

POTENTIAL PROGRAMS							
Identified By:	**Name:**	**Point of Contact:**	**Intended Audience:**	**Potential Funding Sources:**	**Hosted By:**	**Location:**	**How does this benefit the CC & Reduce Barriers?**
PG&E	Mobile Technical Trainings						
City of Visalia	SCE Educational Coordinator	Lionel Moreno Lionel.moreno@sce.com					
City of Fresno	BEC Training		Building Officials				
SJV Clean Energy Org.	Rural Development Center						
SJVAPCD	Alternative Fuel Mechanical Training Program (Remove Program)						
SJV Clean Cities Coalition	Car Dealerships						

Education & Outreach

AUDIENCE: LOCAL OFFICIALS					
Identified By:	**Name:**	**Point of Contact:**	**Meeting Dates:**	**Location:**	**How does this benefit the PEVCC & Reduce Barriers?**
SJV Clean Energy Org.	View Partnership (PG&E, SCE, Kings & Tulare)				
SJV Clean Energy Org.	CA Partnerships for San Joaquin Valley (private/public entity)				
Kern COG	Monthly Workshops Prior to Board Meeting Televised on KGOV				
Kern COG	Monthly Committee Meetings (e.g. transportation technical advisory)				
SJVAPCD	Board Meetings				
Kern COG/SJV Clean Cities Coalition	Kern Energy Watch Program				
Fresno COG	Policy Board- *Mayors, County Supervisor and public*		Last Thursday of every month at 5:30pm		Limited to 10 minute presentation. Presentations for the Policy Board are generally saved to the end of the meeting. Policy Board meetings begin at 5:30 p.m. and generally end around 7:30 p.m. but if an agenda item is of particular interest the meeting may end much later.

Education & Outreach

AUDIENCE: LOCAL OFFICIALS					
Identified By:	**Name:**	**Point of Contact:**	**Meeting Dates:**	**Location:**	**How does this benefit the PEVCC & Reduce Barriers?**
Fresno COG	Transportation Technical Committee (TTC)- *City Managers and public*		Second Friday of every Month at 8:30am		Limited to 10 minute presentation. Presentations for the TTC/PAC are joined at 10:00 a.m. so that the TTC members can stay after their meeting and the PAC members can attend before their meeting. Members of the public are committee/voting members of the TTC.
Fresno COG	Policy Advisory Committee (PAC) *City Public Works/engineers/ public*		Second Friday of every month at 10am		Limited to 10 minute presentation. Presentations for the TTC/PAC are joined at 10:00 a.m. so that the TTC members can stay after their meeting and the PAC members can attend before their meeting.
AUDIENCE: COMMUNITY					

Education & Outreach

Identified By:	Name:	Point of Contact:	Location:	How does this benefit the CC & Reduce Barriers?
SJV Clean Energy Org.	Rural Development Center			
City of Visalia	SCE Education Coordinator	Lionel Moreno Lionel.moreno@sce.com		
SJV Clean Cities Coalition	Car Dealerships			
Tulare	Air Quality Grant Funds			

Climate Action Plan (CAP) & Sustainability Action Plan (SAP)

Organization Name:	Do you currently have a CAP or SAP?	Is a CAP or SAP currently being developed?	Does your CAP or SAP have any specific language that benefits EVSEs or Electric Vehicles? (e.g. EV fleets)

SECTION 6: PERMITTING AND INSPECTION

This section focuses on the permitting and inspection processes for the installation of residential and nonresidential EVSE in the San Joaquin Valley. The first part recognizes the barriers and potential policy gaps toward creating local permitting and inspection requirements for EVSE from the San Joaquin Valley PEV readiness survey. The next part provides a summary of the actions taken to date addressing permitting requirements for PEVs in the San Joaquin Valley. In order to tackle the identified barriers, the final part outlines concise recommendations to streamline EVSE permitting and inspection processes for jurisdictions in the San Joaquin Valley.

Policy Gaps and Areas for Improvement: Permitting and Inspection

Fourteen jurisdictions in the San Joaquin Valley region completed the permitting and inspection section of the PEV readiness survey. This is roughly 22% of the 64 cities and counties originally contacted to complete the survey. Based on the results on this section, we have identified there is a definitive need for jurisdictions to be exposed to best practices of other agencies' permitting and inspection requirements for EVSE. The following table highlights the results.

Participating Jurisdictions in the San Joaquin Valley: **Cities of Lemoore**, **Tracy**, **Fresno**, **Tulare**, **Patterson**, **Lodi**, **Kingsburg**, **Orange Cove**, **Sanger**, **McFarland**, **Newman**, **Modesto** and **Turlock** and the **County of San Joaquin**

Note: The **City of Tulare** had two individuals provide separate responses for their jurisdiction, each was credited. This information is based on surveys conducted in 2012, some cities may have begun working on PEV readiness since the survey was implemented but this will not be reflected in the section below.

Assessing Permitting and Inspection of EVSE in the San Joaquin Valley

Percent*	Agency Assessment
0%	Agency has already adopted requirements for EVSE that we feel would be a best practice example for the state of California
7%	Agency is in the process of adopting requirements for EVSE (**Fresno**)
27%	Agency is looking at other agencies' requirements for EVSE to determine what is best for their jurisdiction (**Tulare**, **Sanger**, **Turlock**, **County of San Joaquin**)
7%	Agency requires further information to determine requirements for EVSE (**Lodi**)
7%	Agency has only started to consider how to adapt requirements for EVSE (**Lemoore**)
53%	Agency has not started to look at how to adapt requirements for EVSE (**Tracy**, **Tulare**, **Patterson**, **Kingsburg**, **Orange Cove**, **McFarland**, **Newman**, **Modesto**)

*All percentages are rounded to the nearest whole number; as a result, the total percentage may not equal 100%

It is important to note that almost half of the agencies (47%) stated that additional permits for trenching or replacing concrete are required, while 40% of jurisdictions said additional permits were not required.[16] Responses varied when jurisdictions answered if a permit is required for ADA compliance, with only 33% requiring a permit, 53% not requiring a permit and 13% not sure. The **City of Patterson** requires an encroachment permit for the installation of EVSE, which will meet ADA and parking requirements for the city. It should be noted that cities of **Orange Cove**, **Sanger**, **McFarland** and **Newman** already have ADA compliance issues built into the original permitting process and permits will not be issued unless it has a plan check and ADA compliance. The **City of Turlock** responded that it did not require an extra permit for concrete work or trenching, but would if the installation obstructed the public right of way.

Majority of Regional EVSE Installations Require a Building and Electrical Permit

The majority of jurisdictions in the San Joaquin Valley require a building and electrical permit for an EVSE installation. For example, 60% of the jurisdictions surveyed require a building and electrical permit for EVSE installations in single-family residences, whereas only 20% of jurisdictions require a planning entitlement. Similarly, 60% of jurisdictions require a building and electrical permit for commercial and multifamily installations.[17]

Despite the lack of permits specifically for EVSE throughout the region, 80% of respondents identified that their jurisdiction offers over-the-counter electrical or building permits for EVSE installations. A third of the cities surveyed allow applicants to mail in a hard copy of a permit application. While a little more than a quarter of the jurisdictions offer online permitting services (27%), including the cities of Tracy, Sanger, Newman and Turlock.

Permit Costs Vary by Type of EVSE Installation

As Section 3 indicates, the majority of EVSE in the San Joaquin Valley are installed in single-family homes. Based on the results of the survey, almost half of regional agencies (47%) charge between $101 and $250 for an electrical permit to install an EVSE in a single-family home. A third of the cities polled indicated a significantly higher permitting cost for commercial and multifamily unit installations at $500 per project. According to respondents, the permitting costs vary based on a number of factors. For instance, a number of cities reported that the cost of a commercial EVSE installation is proportional to the scope of the project. In the case of the **City of Sanger**, permit costs for commercial EVSE installations will depend on

Costs of Permits by Type of EVSE Installation*

Type of Installation	Permit Cost				
	<$100	$101 – $250	$251 – $500	>$501	Not Sure
Single-Family Residence	20%	47%	0%	13%	13%
Commercial/Multifamily Unit	13%	33%	7%	33%	13%
Open Parking Lot	13%	33%	13%	13%	20%
On-street Parking	20%	40%	0%	0%	40%

*All percentages are rounded to the nearest whole number; as a result, the total percentage may not equal 100%. Please note that a complete jurisdiction list and their corresponding permit costs are included in the permitting and inspection section of the Appendix.

[16] The cities of **Lodi** and **Kingsburg** were not sure if an additional permit was required for trenching and concrete work

[17] A small percentage of jurisdictions throughout the region require multiple types of permits for EVSE installations (e.g., mechanical and grading permits issued by the city engineering department). A full list of these cities is included in the Appendix.

the number of electrical outlets and panels needed to complete the project. Furthermore, the **City of Newman** indicated that the baseline permit cost for a commercial and open parking lot EVSE installation are less than $100 but will increase if the project's scope becomes larger. The table to the left shows the permitting cost by type of EVSE installation.

It is important to highlight that some jurisdictions were unsure of the permit costs for an EVSE installation. This is not surprising, because a number of regional agencies indicated that they have never had to issue a permit for any type of EVSE installation. This emphasizes the need to be proactive by distributing EVSE permitting and inspection best practices throughout the region so jurisdictions have the permitting guidelines necessary before PEV adoption increases in their area.

Lengthy Permitting Delays for EVSE Installations

Of all the agencies surveyed, very few in the region offered permitting services in less than five business days. In fact, the majority of agencies (53%) took between six to 10 business days to issue a permit for an EVSE installation in a single-family home, which compared to nonresidential installations, is usually far less complex. Therefore, it is not surprising to see that 27% of regional agencies were unsure of the time length for permits issued for on-street installations of EVSE due to the lack of public PEV infrastructure in the region. The **City of Modesto**, for instance, stated that it does not allow on-street parking EVSE installations, and as a result, no permit issuance policy exists for this type of installation.

Of particular note is the **City of Turlock's** Building and Safety Division, which has some of the shortest permitting times in the San Joaquin Valley. **Turlock**, which is the only city in the region to have created an EVSE installation checklist, offers same-day permitting for single-family residential installations and 2 to 5 days for public installations, such as commercial and open parking lot projects. This may be due to the number of options available to permit applicants, such as online services and over-the-counter application processing. Despite **Turlock's** success, many jurisdictions in the region do not have the funds to develop and offer online permitting services. Therefore, **Turlock's** internal permitting policies for EVSE should be documented and shared throughout the region. While there is a nascent PEV market in the San Joaquin Valley, lengthy permitting times will significantly inhibit further market development. Longer permitting timelines result in higher costs for electrical contractors pulling the permit, which is passed on to the end consumer.

Lack of Jurisdictional Knowledge of EVSE Installation Checklist Best Practices

In terms of specific PEV infrastructure permits, 100% of jurisdictions do not offer a unique "EVSE permit" (as compared to an electrical service permit for 240-volt

Time to Issue Permits by Type of EVSE Installation*

Type of Installation	Time to Issue Permit					
	Same Day	2 – 5 Days	6 – 10 Days	3 – 5 Weeks	>5 Weeks	Not Sure
Single-Family Residence	13%	7%	53%	20%	0%	0%
Commercial/Multifamily Unit	7%	7%	27%	33%	13%	0%
Open Parking Lot	0%	7%	33%	40%	0%	7%
On-street Parking	0%	0%	33%	27%	7%	27%

*All percentages are rounded to the nearest whole number; as a result, the total percentage may not equal 100%. Please note that a complete jurisdiction list and their corresponding permit issuance times are included in the Permitting and Inspection section of the Appendix.

circuit). In support of this regional trend, 93% of survey respondents identified that their jurisdiction does not have an exclusive inspector checklist for an EVSE installation. The **City of Turlock** is the only city in the region that has created an inspector checklist for EVSE installations. The city reported that they developed the checklist with their own staff while also looking at other city or agency permitting and inspection requirements. Furthermore, **Turlock** responded that it would be willing to share this best practice with other regional partners.

The majority of jurisdictions (87%) require plans or blueprints in a permit application, while 80% require load calculations, and more than half (53%) require the applicant to notify their local utility that a permit for EVSE installation has been pulled. A complete list of items required in a permit application for an EVSE installation by jurisdiction is located in the table below.

Permitting Inspection Requirements

After an EVSE is installed, the number of inspection processes differs throughout the region. For example, the most lengthy inspection process includes an intermediate and post inspection, which accounts for 33% of commercial and multifamily EVSE installations. Having more than one inspection increases wait times for EVSE installations to be completed. While this process is understandable, as the market continues to evolve in the region, efforts are needed to streamline the process to only one inspection during each EVSE installation. The following table lists the inspection scenarios reported by jurisdictions for each type of EVSE installation in their area.

Items Required in a Permit Application for an EVSE Installation by Jurisdiction

Items Required in Permit Application	Jurisdiction
Plan/Blueprints	**Lemoore**, **Tracy**, **Fresno**, **Tulare**, **Lodi**, **Kingsburg**, **Orange Cove**, **McFarland**, **Newman**, **Modesto**, **Turlock** and **County of San Joaquin**
Load Calculations	**Lemoore**, **Tracy**, **Fresno**, **Tulare**[18], **Patterson**, **Lodi**, **Kingsburg**, **Orange Cove**, **Sanger**, **McFarland**, **Modesto**, **Turlock** and **County of San Joaquin**
Utility Notification by Applicant	**Tracy**, **Tulare**, **Patterson**, **Sanger**, **McFarland**, **Modesto** and **Turlock**

[18] The second respondent for the **City for Tulare** did not choose load calculations as an item required in the permit application.

Inspections Required for EVSE Installations*

Type of Installation	Inspections Required					
	Plan Check Only	Pre-Inspection	Post-Inspection	Pre- & Post-Inspection	1+ Pre- & Post-Inspection	Intermediate & Post-Inspection
Single-Family Residence	33%	7%	13%	33%	0%	20%
Commercial/Multifamily Unit	33%	7%	13%	27%	7%	33%
Open Parking Lot	40%	7%	20%	27%	0%	20%
On-street Parking	33%	13%	13%	27%	0%	20%

*All percentages are rounded to the nearest whole number; as a result, the total percentage may not equal 100%. Please note that a complete jurisdiction list and their corresponding requirements for inspections are included in the permitting and inspection section of the Appendix.

Most of the jurisdictions surveyed (93%) reported that applicants can call the office to request an inspection date and time for the EVSE installation, while 67% allow applicants to request an inspection in person at the permitting office. Again, online services are limited, as only 20% of agencies allow applicants to request an inspection of an EVSE installation online.

Despite the variation in inspection requirements for EVSE installations in the region, the majority of agencies polled (73%) indicated it took 2-5 days for an inspection, with 13% of agencies stating they provide same-day inspection services. The cities of **Patterson** and **Kingsburg** stated that the EVSE inspections are based on a number of factors and that an estimate on the length of time it would take to complete an inspection could not be determined. An inspection process of 2-5 days is rather efficient compared to wait times for applying for a permit, and regional efforts should be taken to maintain these inspection times as PEV adoption and subsequent public EVSE demand increases in the San Joaquin Valley.

Addressing Policy Gaps and Areas for Improvement

Overall, municipalities throughout the San Joaquin Valley have a limited knowledge and involvement in developing permitting processes for EVSE. However, some cities have begun to address permitting for EVSE. The City of Turlock is one of the municipalities that have started working to streamline the permitting and inspection process by creating an EVSE installation checklist for regional EVSE installers.

Streamlining EVSE Permitting Process with EVSE Installation and Permitting Requirements

City of Turlock

At the time this report was written, CCSE learned that the **City of Turlock** was the only jurisdiction polled in the survey that currently provides an inspector checklist for residential EVSE installations. The city's Building and Safety Division staff developed this checklist using outside resources, such as other city or agency EVSE installation requirements. Turlock's building and planning staff also contributed to the design of the checklist. Furthermore, city staff indicated that they would be willing to share their best practice document with regional partners.

For a copy of the City of Turlock's *Electric Vehicle Charging System in Single Family Residence Plan Review and Permitting Requirements*, see the permitting and inspection section of the appendix.

Recommendations for Regional Next Steps

Based on the feedback from the PEV readiness survey and outreach to municipal staff throughout the region, we have identified a central theme: municipal staff have a

very limited knowledge of PEVs and EVSE technology. This made it difficult for them to answer questions related to EVSE policies and guidelines. In fact, one survey participant responded that he "couldn't fathom where to start" when considering adopting permitting and inspection requirements for EVSE. This situation highlights the need for best practice documents to be distributed throughout the region. Indeed, all agencies reported that it would be helpful to have available for reference other city or agency permitting and inspection requirements identified as examples of best practices in the state.

Another theme we have identified is that the majority of agencies surveyed across the region reported prolonged wait times for permits to be issued for EVSE installations. This is especially true for EVSE installations in single-family homes, where 73% of agencies surveyed responded that it took more than a week. This is a large barrier for PEV deployment in the region because approximately 89% of charging typically takes place in the PEV driver's residence; thus the region can ill afford to alienate potential PEV drivers with lengthy permitting delays.[19]

We have identified four recommendations that focus on increasing awareness of EVSE permitting and inspection processes, reducing permitting times and streamlining the communication channel between municipalities and utilities. The final recommendation establishes a strategy that utilizes the San Joaquin Valley Plug-in Electric Vehicle Coordinating Council to review and prioritize national and state best practices and identify how these will be implemented in the region. Please note that a complete list of best practices reviewed in preparation of this plan is included in the permitting and inspection section of the Appendix.

Regional Adoption of EVSE Permitting and Inspection Guidelines for Residential EVSE Installations

The number of EVSE installed on residential properties is minimal in the San Joaquin Valley. As the demand for PEVs in the region increases, residential installations will need to become more streamlined.

Recommendation: All jurisdictions in the San Joaquin Valley adopt a residential permitting guideline for the installation of home EVSE. This guideline should leverage existing guides created by municipalities across California (e.g., Sacramento) but be modified to the San Joaquin Valley. At a minimum, the guide should include requirements such as supporting plans (e.g., single-line diagrams), load calculations, permit costs and inspection processes. In addition, this template also should include the type and size of wire and conduit used in the installation. It is further encouraged that SJV PEVCC assist in this process by providing a template for jurisdictions throughout the region. Once developed and distributed, municipalities are encouraged to modify this document with information relevant to their jurisdiction.

Benefits: Taking a proactive approach to streamline the EVSE permitting and inspection process to prevent future delays and problems before the number of PEVs increase throughout the region.

Develop Express Permitting for Simple Residential EVSE Installations, Waive Plan Check Requirement for These Permits

Recommendation: When possible, institute online permitting processes for simple residential EVSE installations. This process can be modeled after the City of Turlock as well as the processes developed in the cities of Los Angeles and San Francisco. If online permitting is not an option, jurisdictions should implement an express over-the-counter process, with a goal of issuing within 2-5 days. In this case, an electrician would provide a simple scope of work along with the specification sheet for the EVSE in order to obtain the permit. In both of these cases, jurisdictions should also leverage the permitting guidelines template that will be developed by the SJV PEVCC (see previous recommendation) as part of the permitting process. Municipalities are encouraged to utilize the Los Angeles definition of a simple residential EVSE installation:

"Electrical installation for electric vehicle charging in single-family dwellings with up to 400 amps of service. (Including any needed charging equipment, service upgrade, receptacle and associated wiring.)"[20]

[19] http://www.plugincars.com/ecotality-evaluation-plug-vehicle-charging-methods-124983.html

[20] Los Angeles Express Online Permits, http://ladbs.org/LADBSWeb/e-permit.jsf

Benefits: Online processes reduce the application time as well as the up-front paperwork. When online permitting is not possible, express over-the-counter processes can also reduce the permitting time.

Develop EVSE Permit Municipality-Utility Communication Channel

There is a need for a coordinated and efficient notification process to local utilities when EVSE is installed in the San Joaquin Valley.

Recommendation: Create a jurisdiction-utility EVSE communication channel by which each jurisdiction in the San Joaquin Valley communicates directly with the power service provider. This would entail the permitting office or responsible party in each jurisdiction establishing a protocol to contact PG&E, SCE or the local municipal utility when a residential permit for EVSE installation is pulled. Identify and direct contacts at the utility and the jurisdiction to facilitate this communication.

Benefits: Each regional utility will be able to accurately track the number of residential EV charging stations and properly plan for increased electricity load due to charging. Allows the utility to provide greater access to residents regarding PG&E and SCE PEV time-of-use (EV TOU) rates and advise customers on meter installation options that are in line with the PEV rate the customer prefers.

Utilize the SJV PEV Coordinating Council (PEVCC) to Identify, Prioritize and Implement Permitting and Inspection Best Practices to Regional Stakeholders

Recommendation: Leverage SJV PEVCC members and the list of existing best practices collected by CCSE to identify and prioritize additional EVSE permitting and inspection best practices that will assist in promoting PEVs through policies and processes that are relevant to the San Joaquin Valley. Once these best practices have been prioritized, work with SJV PEVCC members to disseminate and develop appropriate implementation plans on either the regional or the jurisdictional level.

Benefits: Working with SJV PEVCC members will help to ensure regional support for permitting and inspection best practices and thereby create a greater likelihood of implementation. In addition, leveraging the members of SJV PEVCC's extensive network of regional contacts provides a more efficient way to channel best practices and other resources to municipalities with the greatest needs.

San Joaquin Valley Regional EV Infrastructure Working Group Best Practice

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 PEVCC 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.

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.

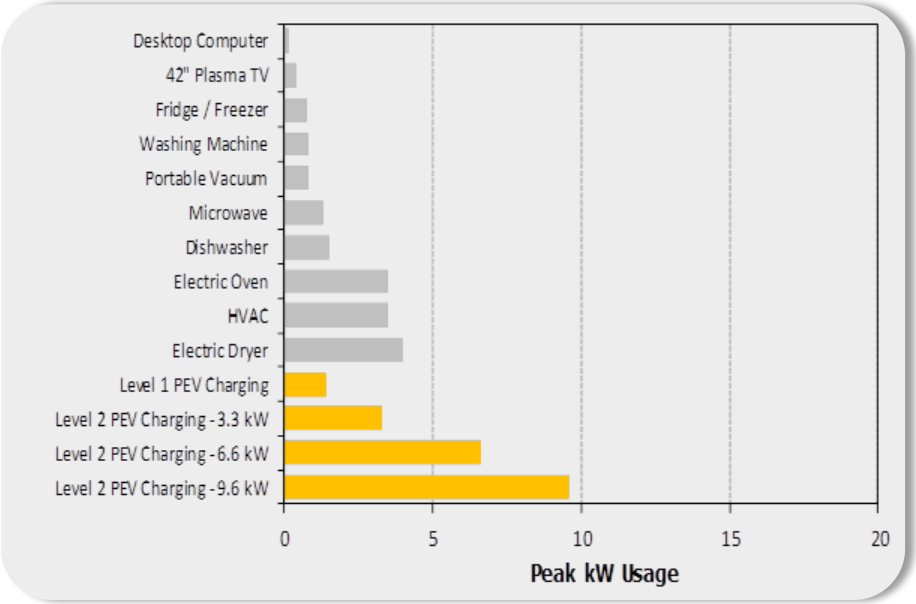
Is an inspection required for my EV charger?

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 Insert inspection call in phone number of the request.

Contact your Local Utility 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 your utility 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 your utility, you will learn of special EV

charger rates that may be offered. These rates can provide you a significantly lower cost for electricity based on the time of day you charge your vehicle.



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)).

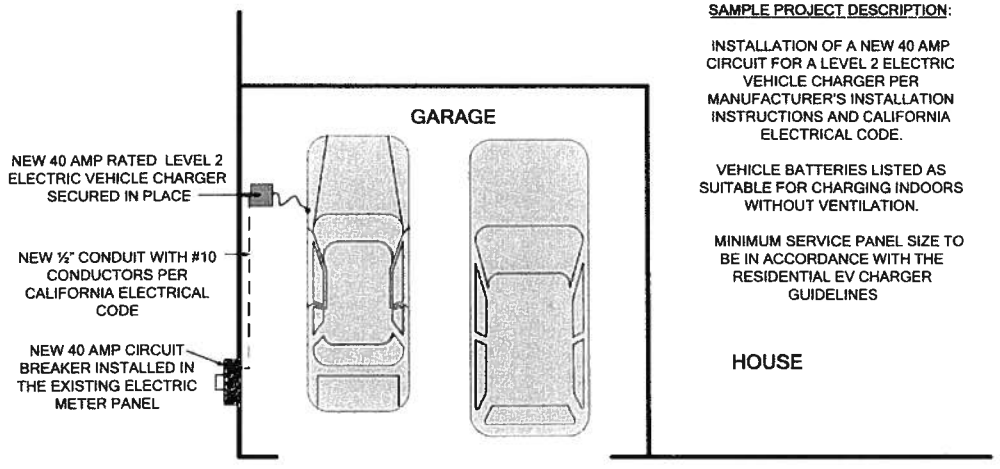
3. LISTED EQUIPMENT - All Electric Vehicle Supply Equipment shall be listed by a nationally recognized testing laboratory.

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.*

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)

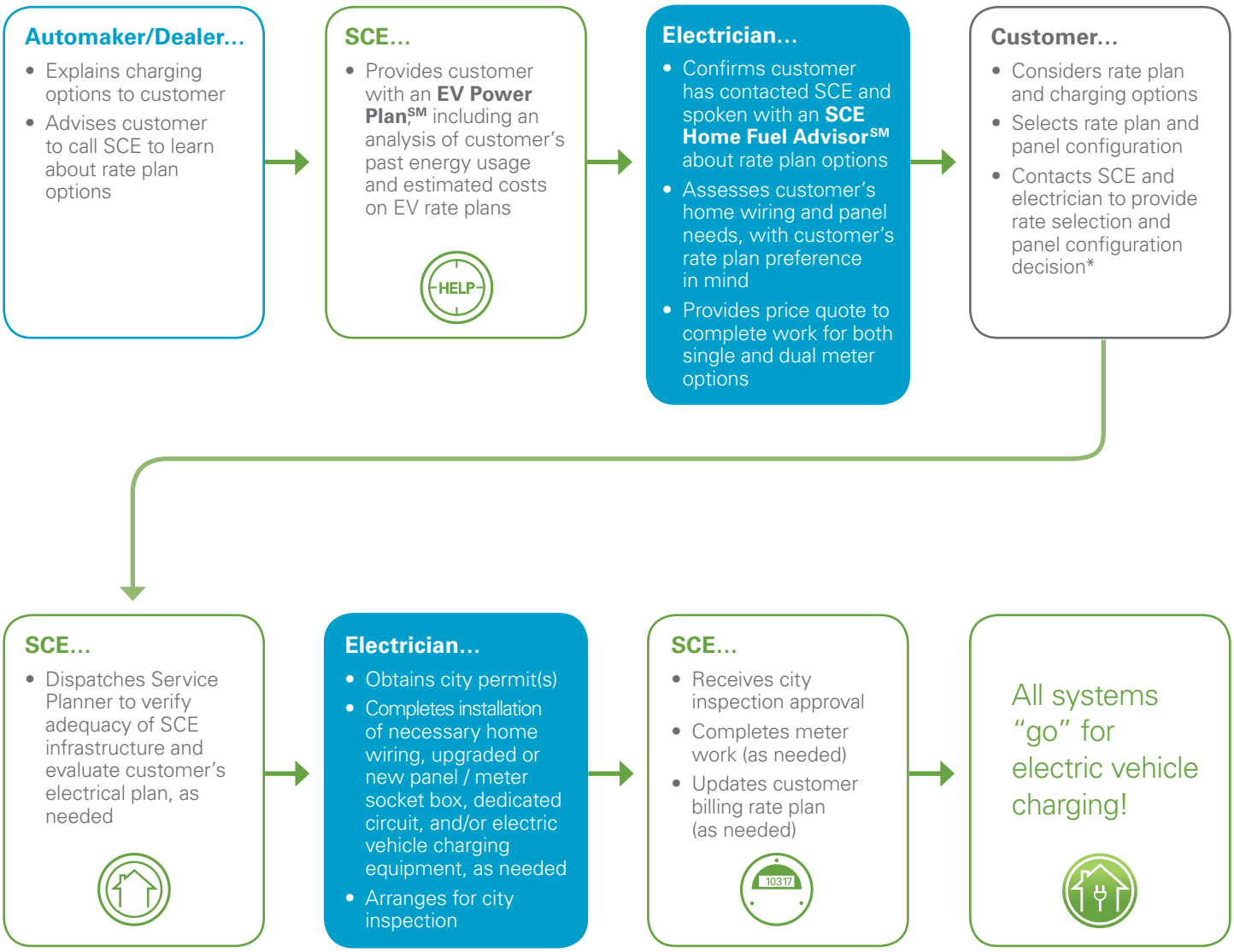
Customers can also visit:
sce.com/ElectricVehicle

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.



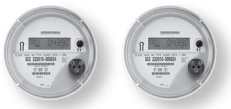
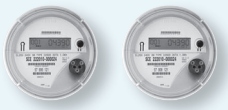
* By reminding your customer to call both you **and** SCE after deciding on the electrical work, SCE can send a Service Planner to the customer's home so you can finish your work as quickly as possible. Knowing a customer's rate plan selection, electrical vehicle charging level, and planned panel configuration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

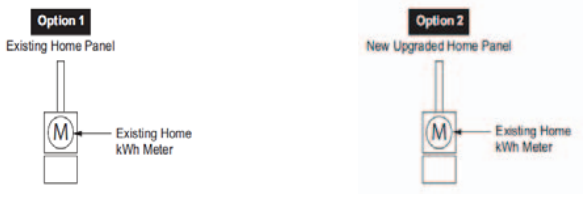
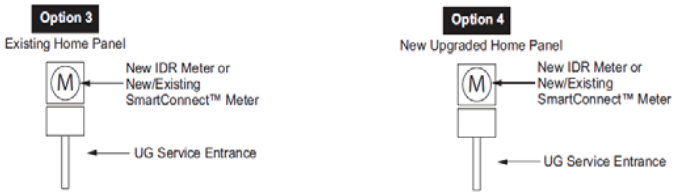
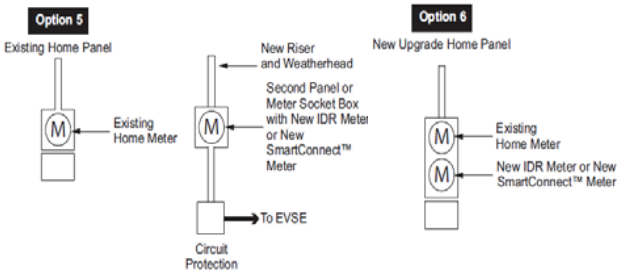
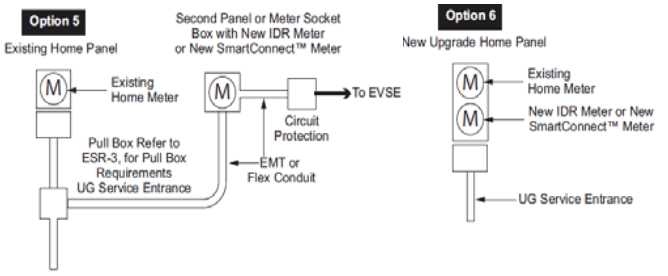
Rate Plans	Rate Description	Panel Choices		
		Use Existing Panel	Add 2nd Panel or Meter Socket Box	Upgrade Existing Panel
Residential Plan (Your Current Rate) *Single Meter*	**Your Current Rate** Home and electric vehicle loads measured together	 **Option #1** (no meter change)	N/A	 **Option #2** (meter 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.

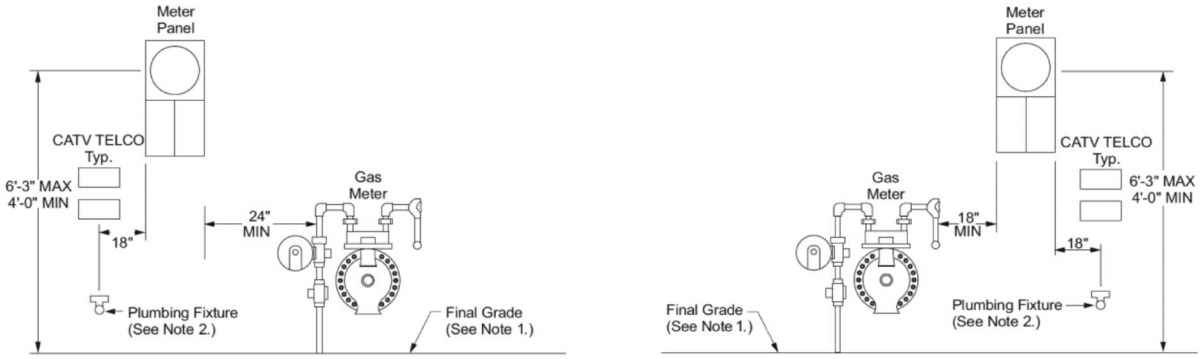
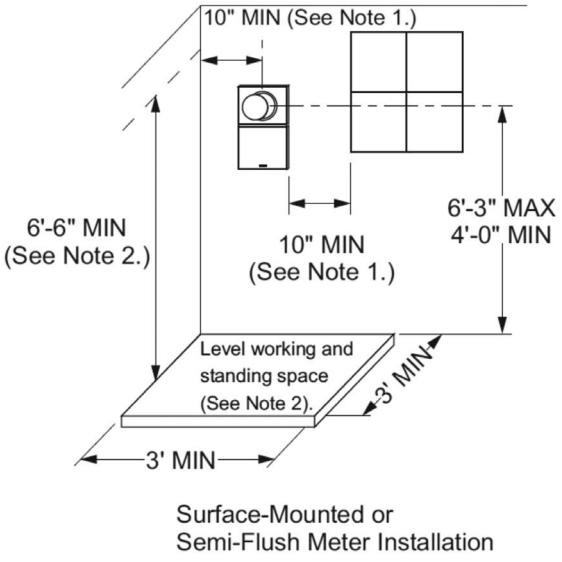


Figure 5–5: Surface-Mounted or Semi-Flush Meter Installation

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.



Surface-Mounted or Semi-Flush Meter Installation

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.

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Progress on Regional PEV Barriers

Barriers/Solutions Being Addressed by the SJVPEVCC		
Barriers in Order of Priority	**Progress on Solutions – Preparation of Guidance Materials**	**Action Items**
1. Lack of Public Knowledge of PEV and EVSE Municipal outreach to Local Residents and Businesses	• Barrier identified in SJVPEV Readiness Plan (pg. 43 – 47) • During the February 7, 2013 meeting, this barrier was voted as the highest priority in the Valley. • During the March 7, 2013 meeting, the coordinating council (CC) provided recommendations for education and outreach avenues. The CC requested a presentation be created and distributed to the group in order for the CC to use	• The CC requested a presentation be created and distributed to the group • Follow up with the CC and request further information regarding recommended education and outreach avenues
2. Zoning and Parking Rules Lack of standard regional ordinances that facilitate the installation and access to publicly available charging infrastructure.	• Barrier identified in SJVPEV Readiness Plan (pg. 19 – 24) • During the February 7, 2013 meeting, this barrier was voted as the second highest priority in the Valley • During the March 7, 2013 meeting, the CC agreed that zoning and parking rules are important and next steps need to be taken however the PEVCC highlighted the importance of educating local officials and the public before lobbying for ordinance changes.	• To be discussed again at a future meeting
3. Training and Education for Municipal Staff and Electrical Contractors Lack of knowledge about PEVs and EVSE	• Barrier identified in SJVPEV Readiness Plan (pg. 39 – 42) • During the February 7, 2013 meeting, this barrier was voted as the third highest priority in the Valley • During the March 7, 2013 meeting, the coordinating council (CC) provided recommendations for training and education avenues. The CC requested a presentation be created and distributed to the group	• The CC requested a presentation be created and distributed to the group • Follow up with the CC and request further information regarding recommended training and education avenues
4. Permitting/Inspection Lack of streamlined permitting and inspection processes and inconsistent (high) costs across jurisdictions.	• Barrier identified in San Joaquin Valley Plug-In Electric Vehicle (SJVPEV) Readiness Plan (pg. 25 - 32) • To be updated as project develops	• To be discussed during April 4, 2013 meeting

Barriers/Solutions Being Addressed by the SJVPEVCC		
Barriers in Order of Priority	**Progress on Solutions – Preparation of Guidance Materials**	**Action Items**
5. On Peak Charging – TOU Utility Rates and Grid Impacts 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.	• To be updated as project develops	• To be discussed during April 4, 2013 meeting
6. Workplace Charging Lack of understanding regarding benefits and approaches to understanding workplace charging.	• To be updated as project develops	• N/A
7. Building Codes Lack of standard building codes that accommodate charging infrastructure or dedicate circuits for charging infrastructure in new construction and major renovations.	• Barrier identified in SJVPEV Readiness Plan (pg. 33 – 38) • To be updated as project develops	• N/A

Barriers/Solutions Being Addressed by the SJVPEVCC		
Barriers in Order of Priority	**Progress on Solutions – Preparation of Guidance Materials**	**Action Items**
8. EVSE at Multi Unit Dwellings (MUDs) 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.	• To be updated as project develops	• N/A
9. Regional Planning for Public EVSE Siting Regional land use and transportation plans served as a basis to identify optimal public EVSE sites.	• To be updated as project develops	• N/A
10. Public Agency EVSE Installations Providing local jurisdictions with knowledge of PEV market development. Need to identify barriers and find solutions.	• To be updated as project develops	• N/A
11. Promotion of 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.	• To be updated as project develops	• N/A

Barriers/Solutions Being Addressed by the SJVPEVCC		
Barriers in Order of Priority	**Progress on Solutions – Preparation of Guidance Materials**	**Action Items**
12. Leveraging Renewable Energy in PEV Charging Educate on the use of renewables in order to provide the fuel to power an EV	• To be updated as project develops	• N/A

Additional Barriers Identified at February 7, 2013 Meeting

13. Lack of Developed Policy, Liability and Management Documents Creating guidelines for municipal management regarding public and workplace operations and maintenance relating to EVSEs.	• Barrier was identified during the February 7, 2013 meeting	• N/A
14. PEV and EVSE Incentives In the early stages of development, incentive programs should be made available and the necessary outreach must be conducted to notify the public about the existence of these programs	• Barrier was identified during the February 7, 2013 meeting	• N/A
15. PEV Friendly Policies in RTP Identify and/or create PEV friendly policies that can be implemented by all regions	• Barrier was identified during the February 7, 2013 meeting	• N/A

Barriers/Solutions Being Addressed by the SJVPEVCC		
Barriers in Order of Priority	**Progress on Solutions – Preparation of Guidance Materials**	**Action Items**
16. Training and Education for Car Dealerships Car dealerships have direct contact with new car buyers so it is important that they are knowledgeable and trained about EVs	• Barrier was identified during the February 7, 2013 meeting	• N/A
17. Interoperability Create the ability of diverse EVSE networks to work together	• Barrier was identified during the February 7, 2013 meeting	• N/A