SAN DIEGO REGIONAL ELECTRIC VEHICLE INFRASTRUCTURE WORKING GROUP

MEETING NOTICE AND AGENDA

Date: **Thursday, September 19, 2013**

Time: **1:00 p.m. to 3:00 p.m.**

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

Staff Contact: **Tyler Petersen**
Tel: (858) 244-4876
Email: tyler.petersen@energycenter.org

AGENDA HIGHLIGHTS

- **PERMITTING/INSPECTION FOR RESIDENTIAL AND COMMERCIAL INSTALLATIONS FACT SHEET**
- **DRAFT READINESS PLAN**

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

SANDAG

Center for Sustainable Energy CALIFORNIA

SAN DIEGO REGIONAL CLEAN CITIES COALITION

www.energycenter.org/pluginready

SAN DIEGO REVI

Thursday, August 15, 2013

ITEM # **RECOMMENDATION**

1. WELCOME AND INTRODUCTIONS

2. ANNOUNCEMENTS

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

+3. MEETING SUMMARY **APPROVE**

The REVI is asked to review and approve the July 18, 2013 and August 15, 2013 meeting summaries.

CONSENT ITEM

+4. REGIONAL PEV BARRIERS PROGRESS REPORT **INFORMATION**

The REVI barriers table is attached.

REPORT ITEMS

+5. CEC GRANT OPPORTUNITY: ALTERNATIVE FUEL READINESS PLANS **INFORMATION**

The California Energy Commission is seeking proposals for "Alternative Fuel Readiness Plans". Staff will provide a brief overview of the grant opportunity, and initial ideas for an application from the San Diego region. This award could continue and expand upon current REVI activities. The REVI is asked to provide input on possible tasks to complete under this grant.

+6. BARRIER 1: PERMITTING/INSPECTION FOR RESIDENTIAL AND COMMERCIAL INSTALLATIONS **DISCUSSION AND ACCEPT**

REVI members have discussed EVSE permitting and installation challenges for both residential and commercial installations. Staff has developed a single fact sheet addressing questions owners can expect when permitting EVSE installations. The REVI is asked to discuss and accept the Permitting/Inspection for Residential and Commercial fact sheet as a primary and universal resource for public distribution and information.

+7. DRAFT PEV READINESS PLAN **DISCUSSION**

The draft PEV Readiness Plan has been developed and is inclusive of input provided by REVI and other interested parties. The draft Readiness Plan is attached and REVI is asked to discuss and comment on the document. Comments will be noted and incorporated for presentation to REVI at the next meeting.

The PEV Readiness Plan Public Workshop is scheduled for October 9, 2013 from 10:30 a.m. – 12:30 p.m. at the SDG&E Energy Innovation Center, 4760 Clairemont Mesa Blvd., San Diego, CA 92117.

8. MATTERS FROM MEMBERS **INFORMATION**

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

9. NEXT MEETING **INFORMATION**

The next REVI meeting is scheduled for Thursday, **October 17, 2013**, at the SDG&E Energy Innovation Center, 4760 Clairemont Mesa Blvd., San Diego, CA 92117.

10. ADJOURNMENT

+ next to an item indicates an attachment

July 18, 2013 MEETING SUMMARY

ITEM #1: WELCOME AND INTRODUCTIONS

Vice Chair Mike Ferry, California Center for Sustainable Energy (CCSE), called the meeting to order at 1:07 p.m. and welcomed everyone to the San Diego Regional Electric Vehicle Infrastructure Working Group (REVI).

ITEM #2: ANNOUNCEMENTS

Brendan Reed, City of Chula Vista, announced that Car2Go services have expanded to the City of Chula Vista.

Chris Schmidt, Caltrans District 11, announced that Caltrans, in association with ECOtality and SDG&E are in the process of installing DC fast chargers at the Del Lago Park and Ride. Mr. Schmidt said that the fast chargers are scheduled to be operational by August 31, 2013.

Randy Shimka, San Diego Gas and Electric (SDG&E), said that Del Lago Park and Ride will also have solar panels installed on-site.

Molly Ash, Cuyamaca Community College, said that Cuyamaca Community College will be installing seven DC fast chargers on campus.

Mo Lahsaie, City of Oceanside, said that they, in conjunction with Ecotality, will be breaking ground soon on four Level 2 and two DC fast chargers at Oceanside Harbor; in close proximity to Interstate 5.

ITEM #3: SUMMARY OF THE MAY 16, 2013 MEETING

There were no changes requested to the May 16, 2013 meeting summary.

Mr. Schmidt motioned to approve. Mr. Reed seconded the motion. Motion carried without opposition.

CONSENT ITEM

ITEM #4: REGIONAL PEV BARRIERS PROGRESS REPORT

Mr. Ferry noted that the attached PEV barriers table contains updated information on REVI's progress.

REPORT ITEMS

ITEM #5: BARRIER 4: TRAINING AND EDUCATION FOR MUNICIPAL STAFF AND ELECTRICAL CONTRACTORS

Anna Lowe, San Diego Association of Governments (SANDAG), reviewed the attached fact sheet developed for municipal staff. Ms. Lowe commented that this document contains resources and technical training information to assist regional public agencies in becoming PEV ready.

REVI members provided the following comments:

- Mr. Reed suggested that the link between this fact sheet and local Climate Action Plans be made.
- Mr. Schmidt said that there should be a statement added that stresses the importance of having infrastructure before services such as car2go, are available in a particular city. Mr. Schmidt further added that there are publicly available subsidies at the municipal level for such infrastructure.
- Mr. Reed commented that he likes how the fact sheet is presented.
- Mr. Schmidt clarified that this information sheet will be a clickable online.
- Ms. Lowe responded that most links are called out so that people have the option to print it out and take it with them.
- Ms. Lowe requested that REVI members inform either SANDAG or CCSE about new, relevant resources so that it can be easily incorporated into the Readiness Plan.
- Mr. Schmidt commented that if these documents are to be published sooner rather than later, perhaps the group won't have to approve one document after the other.
- Mo Lahsaie, City of Oceanside, commented that the Oceanside Fire Department was pleased to see PEV safety training first responders included in the fact sheet.
- Tony Williams, Quick Charge Power, noted that Tesla has a video on its website specifically for first responders.

Ms. Lowe then guided the group to the next fact sheet for electrical contractors. Ms. Lowe noted that this resource displays EVSE trainings available for electrical contractors in the San Diego region, and EVSE equipment installation and maintenance best practices.

REVI members provided the following comments:

- Ms. Ash commented that Cuyamaca College will be offering an updated Electric Vehicle Infrastructure Training Program (EVITP) 3.0 training program with 32 hours of instruction. Ms. Ash said that the EVITP course would be offered in September and that more information should be available soon.
- Mr. Schmidt expressed concern that the committee remains objective.
- Mr. Reed asked if these documents are stand-alone handouts.
- Ms. Lowe said that information compiled through the REVI meetings will be incorporated into the Readiness Plan as narrative.
- Mr. Schmidt suggested that other agencies could review the information.

ITEM #6: BARRIER 5: LACK OF PUBLIC KNOWLEDGE OF PEV AND EVSE

Allison King, SANDAG, reviewed the attached fact sheet developed to address PEV outreach and education for the general public. Ms. King commented that the information covers what a plug-in electric vehicle is, how it works and how it's charged.

REVI members provided the following comments:

- Ms. King noted that the San Diego Clean Cities Coalition and SDG&E are working on informational materials for dealerships.
- Mr. Schmidt suggested that a testimonial video documenting why people buy PEVs be created.

- Ms. Lowe noted that SANDAG would not be able to create such videos, but another group might want to take it on.
- Michelle White, Port of San Diego, suggested the Clean Cities Coalition create the videos.
- Mr. Shimka said that National Plug-in Day could be a good pool of people willing to provide video testimonials.
- The group agreed and suggested that the video be hosted on the Clean Cities website.
- Dennis Mello, San Diego Regional Clean Cities Coalition (SDRCCC), said putting such a video on the Clean Cities website would not be effective without other organizations leading visitors to the website.
- Tyler Petersen, CCSE, briefly updated the REVI members about the dealership project. Mr. Petersen said that the project is in association with SDG&E, SDRCCC, SANDAG, CCSE, and the CVRP; the goal is to create a one-page information sheet for dealerships to have available in their showrooms and for placement in purchased PEVs. Mr. Petersen commented that a final product will be ready for REVI review in the next couple of months.
- A member of the public asked if HOV access stickers for PEVs are still being distributed because it would be a great incentive to highlight.
- Mr. Ferry described the differences between the two HOV access stickers: white HOV stickers are available to battery electric vehicles and green HOV stickers are available to plug-in hybrid electric vehicles.
- Mr. Petersen stated only 40,000 green HOV access stickers are available. Approximately 15,000 have already been distributed.

ITEM #7: BARRIER 10: COMMERCIAL AND WORKPLACE CHARGING

Mr. Petersen reviewed the one page fact sheet for workplace charging.

REVI members provided the following comments:

- Mr. Shimka described SDG&E's experience with workplace charging and lessons learned.
- Mr. Schmidt expressed concern about charging employees for charging at work and said that Caltrans is trying to figure out how to make chargers available to the public and how to provide free service for employees.
- The group discussed making employees pay for workplace charging.
- Mr. Shimka provided an example of SDG&E's workplace charging scenario, in which there is a centralized kiosk used to track the electricity consumed per vehicle.
- The group agreed that this information should be available for download, where possible, on REVI member organization's websites.

Mr. Schmidt motioned to adopt and approve the fact sheets that had been presented in the meeting. Mr. Reed seconded the motion. Motion carried without opposition.

ITEM #8: DRAFT PEV READINESS PLAN OUTLINE

Ms. Lowe presented the key points in the draft outline.

REVI members provided the following comments:

- Mr. Reed said that the Governor's executive order should be added to the introduction so that decision makers are more compelled to support EVs.

- Mr. Schmidt commented that it would be interesting to see what motivates people to adopt PEVs.
- Mr. Petersen noted that the Readiness Plan will include demographics on regional PEV owners, but lacks testimonials from drivers.
- The group engaged in a discussion about the overall tone of the Readiness Plan. Mr. Schmidt believed that the plan should more representative of public interests and not just agency focused; the plan should be more relatable.
- Mr. Schmidt described a disconnect he sees between the barriers table and the flowchart.
- Ms. Lowe noted that the flowchart clusters the barriers table to be more effective.
- Susan Freed, County of San Diego, said that perhaps the recommendations should be targeted to the segment of the community that is adopting PEVs.
- Mr. Schmidt asked how the group will address obstacles for adoption people may face, such as range anxiety.
- Mr. Reed asked if CVRP data would be used in the plan to help answer characteristics about PEV drivers; Mr. Ferry responded that they are not yet sure how to use CVRP data in the plan.
- Ms. Lowe said that the remaining fact sheet will be reviewed during the August meeting, a draft readiness plan will be presented in September and the public workshop is slated for early October.
- The group discussed timing issues for the public workshop in relation to National Plug-in Day.

ITEM #9: MATTERS FROM MEMBERS

There were no matters from members.

ITEM #10: NEXT MEETING

The next REVI meeting is scheduled for Thursday, August 15, 2013 at the SDG&E Energy Innovation Center, 4760 Clairemont Mesa Blvd, San Diego, CA 92117.

ITEM #11: ADJOURNMENT

The meeting was adjourned at 2:32PM.

REVI Voting Member Attendance July 18, 2013

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

REPRESENTATION	NAME	MEMBER / ALTERNATE	ATTENDING
ADVISORY MEMBERS			
Department of Defense	Chris Parry		NO
San Diego Air Pollution Control District	Mike Watt		NO
	Nick Cormier		YES
Metropolitan Transit System	Claire Spielberg		NO
City of Coronado	Bill Cecil		YES
City of Encinitas	Diane Langager		NO
City of National City	Ray Pe		NO
City of Solana Beach	Dan King		NO
City of Vista	Lyn Dedmon		NO
Ecotality	Andy Hoskinson		NO
Car2go	Mike Cully		NO
Aerovironment	Charlie Botsford		NO
Coulomb Technologies	Colleen Quinn		NO
General Electric	David Wang		NO

Others in Attendance

Anna Lowe, SANDAG
Tyler Petersen, CCSE
Jessica Jinn, CCSE
Mo Lahsaie, City of Oceanside
Tony Williams, Quick Charge Power
Molly Ash, Cuyamaca Community College
Four members of the public

August 15, 2013 MEETING SUMMARY

ITEM #1: WELCOME AND INTRODUCTIONS

Tyler Petersen, California Center for Sustainable Energy (CCSE), called the meeting to order at 1:05 p.m. and welcomed everyone to the San Diego Regional Electric Vehicle Infrastructure Working Group (REVI).

Because the chair and vice chair were absent from the meeting, Chris Schmidt, Caltrans, was nominated to chair.

Joel Pointon, San Diego Gas and Electric (SDG&E), motioned for Mr. Schmidt to chair the meeting and Mike Grim, City of Carlsbad, seconded the motion. The motion passed.

ITEM #2: ANNOUNCEMENTS

Mr. Pointon noted that SDG&E's next Multi-Unit Dwelling (MUD) workshop is September 17 at 10 AM.

William Barry, car2go, announced that he will be the new representation from car2go at REVI meetings going forward.

Mr. Pointon announced that National Plug-in Day is now combined with Public Day on September 28, 2013.

Mr. Petersen told the group that the REVI-approved fact sheets are now available on the San Diego REVI website under the resources tab (http://energycenter.org/programs/pev-planning/san-diego/resources). He also mentioned that the ECOtality Form 8-K filing and pending bankruptcy will be addressed at the end of the meeting.

Nick Cormier, San Diego Air Pollution Control District (SDAPCD), said that the Air District has funding available for Proposition 1B Goods Movement Emissions Reduction Program. This program could provide grants up to $10,000 per zero-emission truck. He urged people to spread the news to regional fleet operators.

Mr. Pointon noted that Clean Vehicle Rebate Project (CVRP) funds may be in danger of running out in September or October.

ITEM #3: MEETING SUMMARY

Mr. Schmidt noted an error in the meeting summary of July 18, 2013 under the "Announcements" section. The summary will be reviewed and approved next meeting.

CONSENT ITEMS

ITEM #4: REGIONAL PEV BARRIERS PROGRESS REPORT

Mr. Schmidt noted that the attached PEV barriers table contains updated information on REVI's progress.

REPORT ITEMS

ITEM #5: BARRIER 1.B: PERMITTING/INSPECTION FOR COMMERCIAL INSTALLATIONS

Mr. Petersen provided the group with background information about electric vehicle supply equipment (EVSE) permitting and inspection for commercial institutions. He encouraged the group to discuss the topic before REVI creates a fact sheet. Mr. Petersen asked Randy Schmika, SDG&E, to comment on the permitting process from a utility point of view.

REVI members provided the following comments:

- Mr. Schimka described that the permitting process for commercial installations is more efficient than it was years ago. There are, however, a few problems that he has seen. One, the customers and jurisdictions are giving SDG&E different addresses for the same meter. Mr. Schimka recommended customers should work with jurisdictions to collect the correct address. Second, ADA requirements should be consistent across jurisdictions. He noted the City of San Diego's Technical Policy 11B-1 as a regional best practice. The policy requires that a percentage of parking spaces with EV charging stations in existing or new construction be accessible.
- Anna Lowe, SANDAG, noted that there are unique challenges that exist for different installation projects. Ms. Lowe asked the group to help highlight what these potential hurdles may be.
- Mr. Grim said that it comes down to whether or not jurisdictions want to help subsidize the installation of EVSEs.
- Mr. Petersen asked the group about streamlining the EVSE installation process at commercial locations.
- Mr. Barry said that car2go has had a positive EVSE experience. Between the public EVSE infrastructure and car2go's own charging facilities their fleet is able to meet its charging needs.
- Ms. Lowe asked if a fact sheet is needed for this topic.
- Mr. Grim noted it would be useful to share information about commercial installations.
- The group agreed that a single fact sheet addressing both residential and commercial permitting and installations should be developed.

ITEM #6: BARRIER 6: EVSE AT MULTI UNIT DWELLINGS

Allison King, SANDAG, described the fact sheet for building management and MUD tenants interested in installing PEV chargers. Ms. King noted the work SDG&E has done to address EVSE installations at MUDs. Ms. King explained that this fact sheet was created as a complement to the SDG&E brochure about preparing and installing EVSE in MUDs.

REVI members provided the following comments:

- Mr. Pointon offered an update on research being conducted with the PEV Collaborative (Collaborative) working group on multi-unit workplace environments. The Collaborative has created a survey directed at MUD property owners statewide. The survey is now available

online. Mr. Pointon also noted that the Collaborative's guide to MUD charging [a 30-page handbook] is almost complete.

- REVI discussed the best way to approach engaging more MUD communities – everything from mobile home parks to high-rise buildings. Many group members cited companies that keep these types of records.
- Mr. Grim suggested that the fact sheet include the importance of checking in with local building and planning officials, building management and owners as part of the MUD installation process.

ITEM 7: BARRIER 7: REGIONAL PLANNING FOR PUBLIC EVSE SITING

Ms. Lowe described the Regional Planning for Public EVSE Siting fact sheet. Ms. Lowe noted that the EV Project and its planning and siting process was the primary premise for the regional planning efforts documented in the fact sheet. She further described the importance of the siting process to the Readiness Plan.

REVI members provided the following comments:

- Ms. King noted that the EV Project planning exercise was pretty accurate when considering the locations sited through the planning process are, in most cases, where EVSE were installed.
- Mr. Schmidt suggested that there should be some sort of conclusion at the end of the fact sheet.
- Jacques Chirazi, City of San Diego, suggested including the DC fast charger numbers and noting that the installation and planning process for such equipment is much more complicated.
- Mr. Schmidt asked what will happen to the EVSE deployment in the region after the EV Project concludes at the end of 2013.
- Mr. Grim noted that it depends on the maturity of the market.
- Mr. Chirazi said that car2go is the biggest user of the public stations; areas where fleets, such as car2go, aren't operating are seeing a decline in charging experiences.
- Mr. Schmidt said that Caltrans has received a research grant, in partnership with the University of California, Berkeley, to evaluate the impacts the car2go program has on the region. Further, Mr. Schmidt noted that Mr. Chirazi's point may signify that there is still a severe lack of critical mass for PEVs.
- Mr. Chirazi discussed the potential need for a regional RFP that drives an impetus to increase EVSE at a local level.
- Mr. Schmidt commented that in the San Diego region should explore funding opportunities from the state for installations on a regional scale. He suggested it be picked up as a future agenda item.

ITEM #8: PEVs IN GOVERNMENT FLEETS

Mr. Petersen presented the PEVs in Government Fleets fact sheet and highlighted key information within the document.

REVI members provided the following comments:

- Mr. Cormier said that though the SDAPCD primarily deals with vehicle grants, he has noticed that people who obtain zero-emission trucks are often concerned about the infrastructure required to support the vehicle.
- Mr. Schmidt noted that the State Department of General Services released fleet-specific charging guidelines for State operated fleets. This guidance provides fleet operators with information about how to prepare for fleet charging. Mr. Schmidt said that peer-to-peer exchanges on this information are vital to encourage fleet managers to adopt new technology.
- Jenny Lybeck, Port of San Diego (Port), agreed with Mr. Schmidt and said that the Port held a test drive event for staff after adding electric vehicles to their fleet. The event helped staff understand and accept the technology.
- Mr. Chirazi said that the City of San Diego has held biodiesel forums to encourage people to speak about their experience with biodiesel vehicles. This opportunity has proven to be very powerful.
- Mr. Petersen asked if there are any other local public agencies that have adopted PEVs. There were no examples given but it was suggested that private fleets be included as examples.
- Ms. Lowe said that it is possible to add another section to highlight local businesses with electric fleets (e.g., Frito-Lay and FedEx).
- Mr. Grim said that it is important to focus on private fleets because they have more potential for uptake than the public sector, unless a significant incentive were available.
- Mr. Grim motioned that the group accept Items 6, 7, and 8. Ms. King seconded the motion and the motion passed unanimously.

ITEM #9: REVISED DRAFT PEV READINESS PLAN OUTLINE

Ms. Lowe discussed the outline briefly and noted that changes may be made to the structure as they [SANDAG and CCSE] begin writing. She urged REVI members to let her know if there are any comments or questions on the outline or its content.

REVI members provided the following comments:

- Mr. Schmidt reminded the group that the September meeting will have more content ready to be reviewed.
- Mr. Chirazi noted that in "Basics of PEV and Charging Infrastructure", energy storage and solar-to-EV are important to address. San Diego has some examples of this.
- Ms. Lowe reminded the group that Mr. Schmidt had brought up the idea of testimonials for the document. Such testimonials will be added to the document.
- Mr. Schmidt said that it may be necessary to have a longer meeting in September for robust feedback. He added that the public workshop has been scheduled for October 9th and will be a two-hour workshop that could include presentations for the first half and breakout sessions for the remainder of the time. He further stressed that presentations may be a useful tool for the September REVI meeting and the October public workshop.
- Mr. Petersen noted that the plan is targeted for REVI members' colleagues, for planners, etc. and asked REVI members to spread the news about the public workshop.

- Mr. Pointon and Mr. Grim both noted the potential for advertising the public workshop at Public Day during Plug-In Day.
- The group agreed that the September 19th meeting will be two hours long; it will be spent reviewing the actual Readiness Plan components. The public workshop will follow on October 9th.

ITEM #10: MATTERS FROM MEMBERS

The group decided to discuss the recent news about ECOtality.

Ms. King provided a brief overview of the ECOtality Form 8-K report. The company does not have the sales volume that was anticipated, the Department of Energy (DOE) has suspended further payments to the company, and they cannot fulfill obligations under the EV Project.

Mr. Petersen noted the negative PR this information has on the industry. Mr. Petersen asked if there are thoughts for how to articulate and disseminate this information to others.

Mr. Schmidt suggested that the PEV Collaborative should monitor and possibly take the lead on the issue.

The group further discussed ECOtality and that it may be a desirable opportunity for someone to take over the EV Project infrastructure. Many group members were concerned about contracts that had been signed with ECOtality. The group discussed how to handle worst-case scenarios and ultimately decided that the creation of a sub-committee for further strategizing is necessary.

ITEM #11: NEXT MEETING

The next REVI meeting is scheduled for Thursday, September 19, 2013 at the SDG&E Energy Innovation Center, 4760 Clairemont Mesa Blvd, San Diego, CA 92117. ***This meeting will be two hours.**

ITEM #12: ADJOURNMENT

The meeting was adjourned at 2:32PM.

REVI Voting Member Attendance August 15, 2013

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

REPRESENTATION	NAME	MEMBER / ALTERNATE	ATTENDING
ADVISORY MEMBERS			
Department of Defense	Chris Parry		NO
San Diego Air Pollution Control District	Mike Watt		NO
	Nick Cormier		YES
Metropolitan Transit System	Claire Spielberg		NO
City of Coronado	Bill Cecil		YES
City of Encinitas	Diane Langager		NO
City of National City	Ray Pe		NO
City of Solana Beach	Dan King		NO
City of Vista	Lyn Dedmon		NO
Ecotality	Andy Hoskinson		NO
Car2go	Mike Cully		NO
Aerovironment	Charlie Botsford		NO
Coulomb Technologies	Colleen Quinn		NO
General Electric	David Wang		NO

Others in Attendance

Anna Lowe, SANDAG
Tyler Petersen, CCSE
Jessica Jinn, CCSE
Molly Ash, Cuyamaca Community College
Paul Bussell, Ladybug Electric
Will Berg, car2go
Rebecca Robinson, City of Chula Vista
Bruce Bekkar, Equinox Center
Jeff Wyner, City of Escondido
Michael Biedeger, Equinox Center
Lawrence Emerson, Member of the Public

Progress on Regional Plug-in Electric Vehicle (PEV) Barriers

Barrier	Progress on Solutions – Preparation of Guidance Materials	Action Items
1. Permitting/Inspection Lack of streamlined permitting and inspection processes and inconsistent (high) costs across jurisdictions.	• Residential permit and inspection guidelines accepted by REVI on 3/21/13. • Residential guidelines distributed to REVI and jurisdictions in 3/2013. • City of San Diego and Oceanside permitting guidelines served as examples. • OPR draft permitting documents provided at 5/16/13 meeting.	• State information addresses SF residential; MUD; workplace; retail and public sector; and fast charging. • Utilize elements of the State PEV guidebook in the Readiness Plan. • REVI to discuss and approve combined Residential and Commercial Permit and Inspection Guidelines fact sheet on 8/15/13.
2. Building Codes Lack of standard building codes that accommodate charging infrastructure or dedicate circuits for charging infrastructure in new construction and major renovations.	• REVI feedback on codes incorporated into CCSE's regional readiness assessment (DOE project), Nov-Dec. 2012. • REVI topic at 5/16/13 meeting with presentation on Title 24. • REVI identified building codes as a barrier to work closely with the state on in order to develop regional and statewide consistency.	• REVI will document the barriers and gaps, and ways to coordinate with the state on building codes in the Readiness Plan.
3. Zoning and Parking Rules Lack of standard regional ordinances that facilitate the installation and access to publicly available charging infrastructure.	• REVI topic at 4/18/13 and 5/16/13 meetings. • REVI feedback on parking incorporated into CCSE's regional readiness assessment (DOE project), Nov-Dec. 2012. • City of San Diego Technical Policy on addressing accessibility to EV charging stations presented/ distributed at May 2012 REVI. • Comments submitted to OPR on behalf of REVI 6/6/13 in response to draft EV charging station accessibility guidance.	• In the Readiness Plan, REVI will document the progress made in addressing accessibility, and describe the barriers and gaps encountered during the EV Project and other local installations that require coordination at the state level.
4. Training and Education for Municipal Staff and Electrical Contractors Lack of knowledge about PEVs and EVSE	• Training provided for municipal staff on PEV infrastructure on 1/29/13 at SDG&E EIC. • REVI feedback on training incorporated into CCSE's regional readiness assessment (DOE project), Nov-Dec. 2012. • Greg Newhouse (Miramar College ATTE) administered EV and AFV training for SANDAG's Freeway Service Patrol (tow-truck drivers) and CHP 6/8/13. • The California Manual on Uniform Traffic Control Devises released a policy directive on 3/14/13 including zero emission vehicle signs and markings for consistent statewide use. • REVI approved the fact sheet at the 7/18/13 meeting.	• Use California PEV Collaborative's Toolkit to further address this item. • The information included in the approved fact sheet will inform the Readiness Plan.
5. Lack of Public Knowledge of PEV and EVSE Municipal outreach to Local Residents and Businesses	• Discussed locally at PEV Workshop at CCSE on 6/14/12. • CVRP PEV owner survey conducted. Results at 9/20/12 REVI. • REVI feedback on public outreach incorporated into CCSE's regional readiness assessment (DOE project). • REVI approved the fact sheet at the 7/18/13 meeting.	• The information included in the approved fact will inform the Readiness Plan.

Barrier	Progress on Solutions – Preparation of Guidance Materials	Action Items
6. EVSE at Multi Unit Dwellings Consumer lack of knowledge regarding EVSE installation in these buildings. Need to educate and work with HOAs to identify and find solutions to unique building challenges.	*Region is recognized leader on this issue.* • SDG&E published case study in March 2013. • REVI topic at April, May and June 2013 meetings. • SDG&E published fact sheet on EVSE install process for MUDs. • SDG&E holds quarterly MUD workshops at EIC. • REVI approved the MUD fact sheet at the 8/15/13 meeting.	• Showcase SDG&E MUD activities and barrier busting in Readiness Plan. • Develop complementary materials (if needed) for MUD owners/ occupants that fill information gaps in what SDG&E can provide under CPUC rules. • The information included in the presented documents will inform the Readiness Plan.
7. Regional Planning for Public EVSE Siting Regional land use and transportation plans served as a basis to identify optimal public EVSE sites. In rollout of EV Project, experience was different from planning. Alternate approaches have been taken to increase public EVSE hosts and sites.	*Region is recognized innovator on this issue.* • REVI topic at 3/21/13 meeting. • REVI accepted CCSE fact sheet on value proposition to host EVSE at the 3/21/13 meeting. • REVI accepted the SANDAG public agency guidelines for including EVSE in new construction at the 5/16/13 meeting. • REVI approved the fact sheet at the 8/15/13 meeting.	• SANDAG preparing maps of optimal Level 2 and DCFC EVSE sites for each local jurisdiction. • CCSE to release full report on same topic. • The information included in the approved documents will inform the Readiness Plan.
8. On Peak Charging – TOU Utility Rates A. Need to discourage charging when electricity supplies are in high demand and cost more. Support of time of use (TOU) pricing. B. High demand charges that impact EVSE host utility bills. Expensive metering options to access TOU rates.	*Region is recognized leader on TOU PEV rates.* • Local standout area for solution/ use of TOU rates that encourage off-peak charging. SDG&E holds regular workshops on EVSE hosting and PEV Rates.	• Obtain findings from SDG&E and EV Project to include (and showcase) in Readiness Plan.
9. Public Agency EVSE Installations Contracting issues have stalled many public agencies from taking part in The EV Project. Need to identify common project barriers and find solutions.	• RFP template for public agencies (and commercial entities) accepted by REVI at 3/21/13 meeting. • RFP template distributed to REVI stakeholders and uploaded to REVI website at www.energycenter.org/pluginready.	• Track progress of agencies/ institutions to site and install EVSE.
10. Commercial and Workplace Charging Lack of understanding regarding benefits and approaches to understanding workplace charging.	• REVI topic at 3/21/13 meeting and focus of CCSE analysis of value proposition of hosting EVSE. (see barrier 7) • Ecotality shared initial EV Project findings on public and workplace charging. • REVI approved the fact sheet at 7/18/13 meeting.	• The information included in the approved fact will inform the Readiness Plan.
11. PEVs in Government Fleets Procurement justification needed for local public fleets. Need to describe PEV benefits, including role in reducing municipal GHGs for Climate Action Plans.	• CCSE reviewing local government CAPs for policies to support fleet purchases for local governments (spring 2013). • REVI approved the fact sheet at the 8/15/13 meeting.	• The information included in the approved fact will inform the Readiness Plan.

CEC PON-13-603: Alternative Fuel Readiness Plans

The California Energy Commission (CEC) released an opportunity available to public agencies for the development of Alternative Fuel Readiness Plans (Plans). Grants will be awarded on a "first come, first serve" basis for projects to develop Plans that will provide strategies for the deployment of alternative fuel infrastructure and encourage the adoption of alternative fuel vehicles, which includes electric vehicles.

SANDAG has been discussing the opportunity with potential key partners including the San Diego Regional Clean Cities Coalition (Clean Cities) and San Diego County Air Pollution Control District (APCD) as a way to continue the efforts begun by REVI and address alternative transportation fuels more broadly.

SANDAG plans to submit an application and has received a commitment from the Clean Cities Board of Directors to partner on the project. Below is additional information on the funding available and eligibility. The following page describes the CEC grant objectives and key tasks identified by SANDAG, Clean Cities, and APCD to support the objectives. REVI is asked to review the opportunity and provide input on the key tasks.

FUNDING

Total funding available: $2.1 million

Funding per Applicant: $50,000 minimum to $300,000 maximum

Match Funding Requirements:

- 20% minimum cash or in-kind contributions from non-California state agency sources
- Can be from Applicant/Recipient, subcontractors, or other parties

ELIGIBILITY

Eligible Applicants: Public entities that have a direct role in the development, planning, permitting, or oversight of alternative fuel infrastructure (e.g., cities, counties, air, water, fire districts, and regional planning entities)

The eligible public entity is encouraged to partner with applicable stakeholders to obtain input and feedback for the Applicant during the development of the Plans.

Project Timeline: Project must be completed within **24 months** of award.

Evaluation Process:

- Administrative Screening Criteria
- Technical Screening
  - Eligibility
  - Goals and objectives, and need for the Plan
  - Clear statement of project's purpose, scope of work, and products/outcomes
  - Project collaboration and coordination with applicable stakeholders
  - Previous or current alternative fuel readiness efforts in the proposed project area
  - Approach to the 6 activities that must be addressed (see next page)

SAN DIEGO REGIONAL PROJECT PARTNERS: SANDAG, San Diego County Air Pollution Control District, San Diego Regional Clean Cities Coalition, Miramar College ATTE

Key Participants: Local governments, regional agencies, fleet operators, fuel suppliers, vehicle dealers

Goal: Develop a strategic plan that identifies immediate needs as well as long-term planning objectives in order to prepare the San Diego region for the increased use of alternative transportation fuels.

Grant Objectives and Key Tasks:

- **Analyze existing and potential incentives for increased usage of alternative fuels.**
  - Address the challenge of accessing available state funds
  - Evaluate opportunities to better position the region for state funds
  - Identify ways to incentivize purchasers, fuel providers, station owners (what works for each)

- **Identify challenges and sharing best practices for planning, permitting, deployment, maintenance, and inspection of AFI.**
  - Build upon the experiences with REVI and create a forum for alternative fuel stakeholders
  - Develop materials (best practices, case studies) to aid local governments, fleet operators

- **Develop training materials or classes for fleet operators, planners, first responders, and decision-makers regarding AFI development if no training materials are available.**
  - Determine key skill sets and training needed in relation to different audiences
  - Acquire/modify/create curriculum to address those skill sets
  - Develop strategy for targeting key audiences and engaging in training.

- **Develop strategies and best practices to increase procurement and commercialization of alternative fuels.**
  - Use regional planning based on knowledge from Energy Roadmap fleet assessments and Clean Cities Annual Report to demonstrate potential “hot spots” for stations
  - Identify data sources and monitoring methods
  - Support Local Governments in procuring alt. fuel vehicles/infrastructure

- **Develop marketing analysis, materials, and outreach strategies that communicate the benefits of alternative fuel usage to targeted groups such as fleet owners/operators.**
  - Assess current outreach efforts and identify gaps/needs for various target audiences: hard to reach smaller fleets, larger fleets that are not making the change, engage providers and vehicle dealers
  - Use cost calculators, Ride and Drives, and peer-to-peer experience sharing

- **Develop strategies to assist alternative fuel wholesalers/retailers, with the intent of increasing the availability and/or reducing the cost of alternative fuels.**
  - Engage wholesalers/retailers and identify key barriers to providing alt. fuels
  - Connect fuel suppliers with potential customers, demonstrate demand

ELECTRIC VEHICLE CHARGING STATION INSTALLATION GUIDELINES: RESIDENTIAL AND COMMERCIAL LOCATIONS

Streamlining the Permitting and Inspection Process of Residential and Commercial Electric Vehicle Charging Station Installations[1]

Purpose

This guideline has been developed to streamline the permit and installation process of residential and commercial plug-in electric vehicle (PEV) charging stations, also known as Electric Vehicle Supply Equipment (EVSE). This guide can be used by jurisdictions as a template to provide clear information to homeowners and electrical contractors as to residential and commercial EVSE permitting requirements. Jurisdictions within the San Diego region are encouraged to use this document directly or modify it to reflect the specific requirements of their agency.

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

The type of PEV a person chooses to purchase may determine the way they charge their vehicle. A homeowner may plug their vehicle into a conventional 120-volt household outlet (three-pronged outlet) or install a 240-volt circuit for faster charging. PEVs come with a 120-volt charging cord that enables PEV owners to charge their PEV with a conventional 120-volt outlet. This is a very practical solution for owners of plug-in hybrid electric vehicles (PHEV), such as a Toyota Plug-in Prius or Chevrolet Volt.

On the other hand, a person that purchases a battery electric vehicle (BEV) like a Nissan LEAF may choose to charge using a Level 2 charging station. Level 2 charging stations use 240 volts, which takes about half the time to charge compared with 120 volts. Level 2 charging generally requires the installation of a dedicated circuit and a charging station at your home (usually in the garage). In this case, the homeowner will be required to obtain a permit from their local jurisdiction.

Commercial Charging

Workplace Charging for Businesses in San Diego[2] offers guidance for the installation of EVSE at non-residential locations. It includes information about how to assess the charging needs and potential of a commercial site and relevant resources.

The table illustrates the charging time associated with the most popular BEV and PHEV on the market.

Charging Level	Power Supply	Charger Power	Miles/Hour of Charge	Type of PEV	
				Nissan LEAF	Chevrolet Volt
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

Source: California PEV Collaborative

[1] Adapted from the City of Riverside's *ELECTRIC VEHICLE (EV) CHARGER INSTALLATION GUIDELINES* and the City of Oceanside's *Residential Electric Vehicle Charger Guidelines.*

[2] http://energycenter.org/sites/default/files/docs/nav/programs/pev-planning/san-diego/fact-sheets/Workplace%20Fact%20Sheet.pdf

What do I need to provide to the City in order to obtain a permit?

Residential EVSE Permits

The following are submittal requirements to obtain a permit for the installation of a typical residential EVSE.

Supporting Documentation	Description
Plot 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 (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)
EVSE Information	The EVSE manufacturer's installation instructions and charger specifications.

(Note: Jurisdictions may need to modify this list to reflect their specific requirements)

In most cases, homeowners or contractors simply need to submit the documentation outlined above to the local permitting office (usually the building and safety division,) for review and permit issuance. PEV owners and contractors are encouraged to check their local jurisdiction's permitting website to see if this process is available online. If not, they will likely need to visit the permitting office for an over-the-counter review and permit issuance.

If all of the information is provided and the proposal complies with the applicable codes, the review and approval process occurs shortly thereafter. It is important to note that load calculations per California Electrical Code, Article 220, are required if the existing service panel is rated less than 200 amps. Electrical panel upgrades and electrical wiring shall be in conformance with the current edition of the California Electrical Code (CEC).

Commercial EVSE Permits

Installation of EVSE at commercial locations can be more complex than residential installations and may require additional permits or submittal documentation. The following are some additional considerations for commercial EVSE installations:

- ✓ Zoning Requirements
- ✓ Community or Design Guidelines
- ✓ Existing Use Permits
- ✓ Electrical Source / Metering
- ✓ Parking Requirements
- ✓ Permit and Inspection Fees

A simple commercial EVSE installation may have similar permitting requirements as a residential installation with the addition of a Tenant Improvement (TI) Electrical Permit. A more complex commercial installation may require a modification to an existing Use Permit or a Site Plan addressing specific community or zoning design criteria. It is important to meet with staff from the building and, if necessary, planning departments of the permitting jurisdiction to fully understand all of the necessary requirements and fees prior to permit/s are submitted.

Do I need to get my charging station inspected by the City?

All jurisdictions in the San Diego region require an inspection of an installed EVSE. When the installation is complete, an inspection of the work is scheduled with the Building Inspector upon request. Generally, inspections occur less than one week after the request. Typically, the home or property owner (or tenant) will need to be present during the inspection so that the Inspector can access the location of the charging station and any other electrical or structural change. Please see the attached *EVSE Inspection Checklist*, which has been designed to serve as a guide for local Building Inspectors and has been endorsed by the National Electrical Contractors Association. A residential checklist being used in the cities of Oceanside and San Diego is also included.

How do I install a charging station?

Residential Installations

Installing a residential EVSE may require changes to the home's electrical wiring and utility electricity rates.

- For a step-by-step installation guideline, please view the attached *Plug-in and Get Ready* document. For more information on PEV charging stations currently available on the market, visit www.GoElectricDrive.com.

Commercial Installations

Commercial EVSE installations are often location and use specific. It is advisable to consult the permitting and/or planning agency before breaking ground.

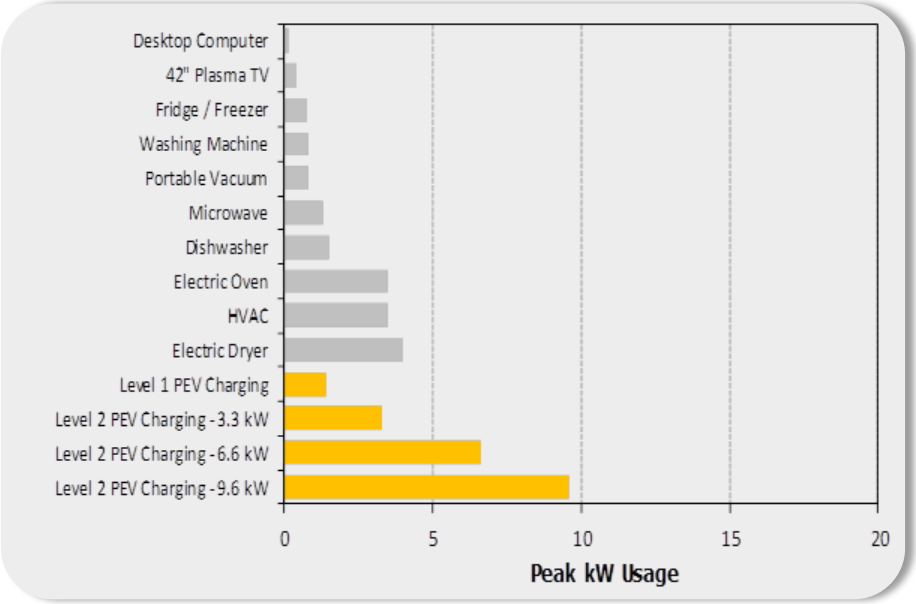
When installing a home or commercial charging station, property owners are encouraged to choose a local electrical contractor with the proper expertise, information, tools and training for installing EVSE to ensure a high quality and efficient installation experience. Please reference the wiring methods based on the California Electrical Code attached.

Why would SDG&E need to know about your charging station?

SDG&E needs to be able to accurately track the number of PEV charging stations installed to properly plan for local increases in electricity demand due to PEV charging. The combined effect of several chargers in the same area could result in overloads on utility secondary wires and transformers. Therefore, utility notification is an important component of providing safe, reliable electricity to all SDG&E customers.

SDG&E can help businesses understand pricing options for employees. They also help businesses identify potential EVSE rebates and incentives.

SDG&E's Clean Transportation Program has created the figure below that displays the significant load difference of a residential EVSE as compared with typical household appliances. According to SDG&E, a PEV charging at 9.6kW may double or triple a household's prior peak load. Additionally, PEV owners who notify SDG&E of a residential EVSE installation will be informed of SDG&E's PEV time-of-use rates (EV TOU). These rates provide a significantly lower cost of electricity for PEV owners that charge during the night, when demand is lower.



Source: San Diego Gas and Electric

Visit SDG&E's website for more information about their Electric Vehicle Programs: http://www.sdge.com/electric-vehicles

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.*

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)).

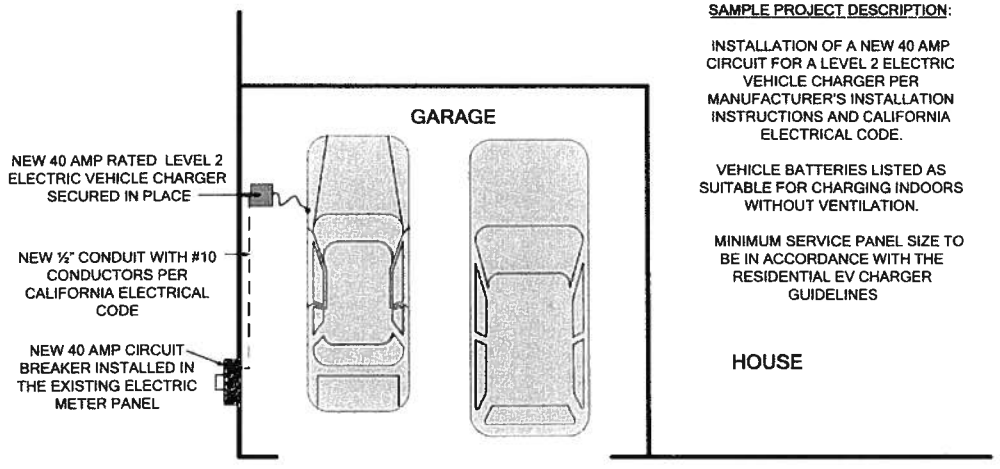
3. LISTED EQUIPMENT - All Electric Vehicle Supply Equipment shall be listed by a nationally recognized testing laboratory.

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