MEETING NOTICE AND AGENDA

REGIONAL ENERGY WORKING GROUP

The Regional Energy Working Group may take action on any item appearing on this agenda.

Thursday, November 20, 2014

11:30 a.m. to 1 p.m.

SANDAG, 7th Floor Conference Room
401 B Street, Suite 800
San Diego, CA 92101

Staff Contact: Allison Wood
(619) 699-1973
allison.wood@sandag.org

AGENDA HIGHLIGHTS

• ENERGY ROADMAP PROGRAM SURVEY RESULTS

• REGIONAL CONSISTENCY FOR ENERGY-RELATED PERMITTING

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# REGIONAL ENERGY WORKING GROUP

**Thursday, November 20, 2014**

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>RECOMMENDATION</th>
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<td><strong>1.</strong></td>
<td><strong>WELCOME AND INTRODUCTIONS</strong></td>
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<td><strong>+2.</strong></td>
<td><strong>APPROVAL OF MEETING MINUTES</strong></td>
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<td><strong>APPROVE</strong></td>
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<td>The Regional Energy Working Group (EWG) is asked to review and approve the minutes from its September 25, 2014, meeting.</td>
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<td><strong>3.</strong></td>
<td><strong>PUBLIC COMMENTS/MEMBER COMMENTS</strong></td>
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<td>Members of the public shall have the opportunity to address the EWG on any issue within the jurisdiction of SANDAG that is not on this agenda. Public speakers are limited to three minutes or less per person. EWG members also may provide information and announcements under this agenda item.</td>
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## REPORTS

**+4.**  | **ENERGY ROADMAP PROGRAM SURVEY RESULTS** |
|          | **INFORMATION** |
| Earlier this year, staff surveyed cities participating in the Energy Roadmap Program in order to receive input on the most valuable program elements. Staff will present the results of the survey and how this information will guide future program components. |

**5.**  | **SAN DIEGO REGIONAL ENERGY NETWORK UPDATE** |
|          | **INFORMATION** |
| Staff will update the EWG on the action taken by the SANDAG Board of Directors related to the exploration of a San Diego Regional Energy Network. |

**+6.**  | **REGIONAL CONSISTENCY FOR ENERGY-RELATED PERMITTING** |
|          | **INFORMATION** |
| Efforts are underway in the San Diego region and across the state to streamline and make consistent the permitting processes related to various energy upgrades. The Center for Sustainable Energy will present on statewide and regional efforts related to permitting for rooftop solar; heating, ventilation, and air conditioning; and electric vehicle charging stations. |

**7.**  | **UPCOMING MEETINGS** |
|          | **INFORMATION** |
| The December meeting of the EWG has been cancelled. The next meeting of the EWG is scheduled from 11:30 a.m. to 1 p.m. on Thursday, January 22, 2015. |

+ next to an agenda item indicates an attachment
November 20, 2014

San Diego Association of Governments
REGIONAL ENERGY WORKING GROUP

AGENDA ITEM NO.: 2

Action Requested: APPROVE

SEPTEMBER 25, 2014, MEETING MINUTES

1. WELCOME AND INTRODUCTIONS

Chair Chris Orlando (City of San Marcos), called the Energy Working Group (EWG) to order at 11:35 a.m.

2. APPROVAL OF MEETING MINUTES (APPROVE)

Action: Greg Newhouse (San Diego Regional Clean Cities Coalition) motioned to approve the meeting minutes from July 24, 2014, and Jack Clark (Center for Sustainable Energy [CSE]) seconded the motion. The motion carried without opposition.

Yes: Dr. Don Mosier (City of Del Mar), Pamela Bensoussan (City of Chula Vista), Dave Weil (City of San Diego), Dave Roberts (County of San Diego), Michelle White (Unified Port District of San Diego), Warren Ruis (San Diego Gas and Electric [SDG&E]), Scott Anders (Energy Policy Initiatives Center [EPIC]), Mike Evans (San Diego Regional Chamber of Commerce), Dave Grubb (Sierra Club), Sharon Cooney (Metropolitan Transit System [MTS]). No: None. Abstain: None. Absent: San Diego County Regional Airport Authority, City of Santee, Environmental Health Coalition, North County Economic Development Corporation, and University of California, San Diego.

3. PUBLIC COMMENTS/MEMBER COMMENTS

John Wotzka (member of the public) discussed energy-related news and provided written comments that are summarized here: Sacramento Municipal Utility District has won a claim for reimbursement of costs to store spent fuel; the Department of Energy has plans to open a spent fuel storage facility by 2048; Currently in the United States, there are 72 metric tons of spent fuel; China is building a high-temperature gas cooled reactor; non-hydro renewables account for 6.5 percent of the energy mix in the United States; SDG&E is pushing for a second gas-fired power plant to meet energy needs; The Environmental Protection Agency (EPA) will require coal and oil utilities to adhere to clean combustion tune-up reports; there are carbon capture and storage projects underway in Mississippi and Canada; More regulations will be implemented into power plant cooling water intake systems under Section 316 (B) of the Clean Water Act; combined cycle gas turbines are under development in China; the EPA wants a 23 percent per kWh reduction in carbon emissions by 2030 in California; over the next 20 years the United States will spend around $2 trillion to upgrade the grid and electrical system; utilities contributed $3.8 billion in assistance to low-income customers in 2012; the government of Egypt called for 80 percent increases on fuel prices to build up the treasury.
Mr. Evans informed the EWG on the issuance of the EPA's New Source Performance Standards for existing power plants. He mentioned that the compliance mechanism is mixed and flexible, and can cover renewables, energy efficiency programs, and demand response. He added that the deadline for comments has been extended to December 1, 2014, and encouraged EWG members to provide supporting comments.

Mr. Evans also alerted the EWG to an upcoming workshop covering flexible capacity on October 20-22, 2014, conducted by the Western Governors Association. Topics will include the amount of flexible capacity on the western grid, balancing reserves to form renewables, and how much renewable penetration can be achieved and what are the limitations. Allison Wood (SANDAG) will send more information to all members.

Mr. Newhouse shared that the San Diego Workforce Partnership will be holding a release of their reports regarding employment, skillset, and education training needs in sectors like renewable energy. This event will be held on October 2, 2014, at the Hall of Champions in Balboa Park.

Mr. Anders informed the EWG of the California Public Utilities Commission (CPUC) rulemaking on distribution planning. If interested, this would be a valuable forum to discuss the future of distribution planning.

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REPORTS

4. REGIONAL ENERGY NETWORK UPDATE (DISCUSSION)

Anna Lowe (SANDAG) presented on the Regional Energy Network (REN) Update. She explained that currently five agencies in the San Diego region have Local Government Partnerships (LGPs) with SDG&E. The SANDAG LGP supports the sixteen cities in the region that do not have their own LGPs through programs such as the Energy Roadmap Program. The Energy Roadmap Program offers free technical assistance and energy management plans to interested cities. Ms. Lowe reported that through this program, nearly all of the sixteen cities have completed roadmaps, and several jurisdictions have moved into the implementation phase.

Ms. Lowe informed the EWG that the five regional agencies with LGPs have pooled together funds from each of their individual LGP budgets to offer a collective of broader energy programs, like climate planning/assistance, and education and outreach for the community. She explained that under the CPUC 2013 – 2014 Energy Efficiency Program Cycle, two RENs were approved as pilots in the Bay Area and in Southern California, which brought additional funding and programs to their regions.

Ms. Lowe furthered that LGPs are components of the utility’s portfolio of programs, where the utility selects and administers these programs. RENs differ because they are a regional collective of public entities, which represent several local governments within a geographic area, report directly to the CPUC, and act as another means to bring energy efficiency funding directly to regions.

Ms. Lowe added that staff continues to work with other public agencies and learn from the existing RENs in order to explore the possibility of a REN for the San Diego region. Ms. Lowe requested input from the EWG to be included in the recommendation presented to the Regional Planning Committee.
EWG members had the following comments:

- Hon. Bensoussan emphasized her support for the exploration of the REN and for SANDAG to become a party to the energy efficiency proceeding.

- Hon. Bensoussan inquired if this funding could be applied to infrastructure as well as programs. Ms. Lowe replied that most programs are at the programmatic level, but there are rebates and incentives offered through these programs.

- Mr. Clark added to the response from Ms. Lowe that funding is primarily energy efficiency focused. There is a possibility for funds to be used towards infrastructure in low-income programs, retrofit activity, and financing.

- Hon. Bensoussan voiced that in the pilot programs, not all funding was utilized, and stressed that planning should be aggressive so this does not happen in our region. Ms. Lowe replied our region could learn from the pilot RENs.

- Ms. White extended her thanks to staff, and informed the EWG that the Unified Port District of San Diego submitted a Letter of Support for this valuable opportunity.

- Mr. Weil offered thanks to staff, and shared that the City of San Diego also submitted a Letter of Support. He mentioned that not only would the region benefit from additional funding, but the five LGPs would be able to implement projects and develop programs that are not available through current programs.

- Mr. Evans announced that the San Diego Regional Chamber of Commerce supports a San Diego REN. He asked if staff needed to define opportunities and submit an estimated budget, and if match funding was required. Also, he inquired whether SANDAG or another entity was best suited to administer the program.

- Ms. Lowe responded that the questions Mr. Evans brought forth were items that are being discussed with the existing RENs and amongst the REN member agencies. She added that the establishment of a REN would be done through a process like that for a grant; staff would need to apply for, and be awarded the funding. Ms. Lowe noted that coordination must occur with the local investor owned utility (IOU) so there is no duplication of programs.

- Mr. Ruis emphasized that the money for a REN would come from ratepayers and urged staff to be thoughtful of potential bill impacts. Mr. Ruis encouraged SANDAG to collaborate with SDG&E to identify current programs in the region and in REN regions, to make sure there is no duplication of programs.

- Mr. Clark informed the EWG that RENs do have energy saving requirements. He added that collaboration is important because high targets have been set and reaching them is not easy.

- Mr. Evans suggested that a performance measurement be added (dollars per kWh savings) in order to monitor the effectiveness of a REN.

- Elizabeth McCollum (TRC) commented that currently, REN cost effectiveness requirements are not as stringent as the IOUs, because they were established as pilot programs, but will move in that direction. She also suggested that staff assess programs that could have a higher cost effectiveness.

- Ms. Lowe emphasized that the ratepayer dollars would stay within the IOU territory in which they are collected. She mentioned not being aware of increased rates associated with the
current RENs. Mr. Ruis explained that it is difficult to determine bill impacts in the other REN territories due to their large geographic area. Mr. Ruis suggested that a REN in a smaller region might have more noticeable impacts.

- Mr. Evans shared that the money would come out of public purpose programs and commented that staff should see if all energy efficiency funds collected from SDG&E ratepayers have been allocated. He also mentioned that utilities have a certain amount of energy efficiency obligations for their territories, just as a REN would.

5. REGIONAL ENERGY STRATEGY TECHNICAL UPDATE (INFORMATION)

Ms. Wood presented on the Regional Energy Strategy (RES) Technical Update to show progress to date from 2009 and key policy changes. Ms. Wood thanked the EWG for input given and helping with data needs for the technical update. Both the updated RES and the Goals Summary are available at sandag.org/res. The creation of the technical update was to align with San Diego Forward: The Regional Plan in order to have updated energy data, and updated policies to inform that plan.

Ms. Wood also provided an update on other key components of the Regional Plan. She mentioned that on September 12, the Board of Directors (Board) accepted the Revenue Constrained Transportation Scenario and now staff is drafting the chapters for the Regional Plan. The Climate Change and Energy Policy areas will draw from the Climate Change White Paper and the RES Technical Update. The draft Regional Plan and associated Environmental Impact Report will be released in spring 2015 for public review.

EWG members had the following questions and comments:

- Chair Orlando informed the EWG about the September 12 Board meeting. He mentioned that over the summer, staff presented a few transportation scenarios for the Regional Plan. The scenario that was decided on includes both active transportation and transit, and roads and other infrastructure projects through 2050.

- Hon. Bensoussan added that the Board also gave direction to staff to analyze another scenario based on the quality of life ideas put forward by the American Lung Association and Circulate San Diego.

- Ms. Cooney commented on the alternative transportation fuels section of the RES. A recommended action that would benefit the use of alternative fuels is to get the federal tax credit back for alternative fuels. Tax credits are helpful in order to see cost savings. She shared that earlier this week MTS was given an $18 million grant to convert the last of their diesel busses into Compressed Natural Gas (CNG). She also mentioned that MTS is working with BP to transition to all renewable biogas CNG in about a year.

- Chair Orlando also shared that EDCO opened a public CNG station in the City of San Marcos this month.
6. KICK-OFF FOR REFUEL: SAN DIEGO REGIONAL ALTERNATIVE FUEL COORDINATING COUNCIL (INFORMATION)

Ms. Lowe updated the EWG on Refuel: the San Diego Regional Alternative Fuel Coordinating Council. SANDAG, in partnership with the San Diego Regional Clean Cities Coalition and San Diego County Air Pollution Control District, received California Energy Commission (CEC) funding to expand Plug-in Electric Vehicle (PEV) Readiness Planning to include all alternative fuels over the next two years. The first Refuel meeting will be Thursday, October 16, at 1 p.m. at the CSE. These meetings will occur quarterly, and subcommittees will meet more regularly with more focused discussions on needs for specific fuels. Invitations for Refuel will be sent out within the next week.

Ms. Wood added that the CEC released a new program opportunity notice for Zero-Emission Vehicle (ZEV) readiness. This grant opportunity is focused on taking the next steps after the PEV Readiness Plan and implementing key recommendations. Ms. Wood explained that there is $3.3 million available, and the grants can be up to $300,000 for PEV readiness, which includes activities like streamlining permitting/inspection process, adopting building codes related to EV charging, and outreach for PEV awareness to the public. Ms. Wood informed the EWG that SANDAG will be submitting an application.

7. ENERGY-RELATED STATE LEGISLATION (INFORMATION)

Ms. Wood informed the EWG on energy-related state legislation. Included in the report is updated information on the cap-and-trade funding programs. Ms. Wood stated that the Air Resources Board (ARB) manages the cap-and-trade program, and develops an investment plan every three years. She mentioned that the Fiscal Year 2014-2015 budget included $872 million for Greenhouse Gas Reduction Funding (GGRF) for various programs. The legislature also established long-term funding for other programs. There are requirements for GGRF allocations to disadvantaged communities (DC) where 25 percent must provide benefits to DC and 10 percent must be allocated to projects in these communities. Ms. Wood informed the EWG that SANDAG has submitted a letter to recommend an adjustment to the definition of DC used by ARB in order to better align with the areas SANDAG has identified as communities of concern in the region.

Ms. Wood touched on a few GGRF programs that would be of high interest to members of the EWG, including the Affordable Housing and Sustainable Communities Program, Low-Carbon Transportation, Low-Income Weatherization Program, Water-Energy Efficiency Grants, and Urban and Community Forestry.

EWG members had the following comments:

- Ms. Cooney added that ARB is going to use the CalEnviroScreen tool for identifying DC. She did mention that now that it has been made aware what screening tool will be used that helps to identify certain projects that can move forward, and what programs will be funded.

- Mr. Anders shared that Assembly Bill 2188 (Muratsuchi, 2013) (AB 2188), which will allow local governments to adopt permitting to streamline for implementation of solar, has been passed by the Governor. He mentioned that the CSE has a Department of Energy rooftop solar grant. EPIC will write a memo and model ordinance stating what it means and what resources to apply. Mr. Clark explained that this could be a potential agenda item for a future EWG meeting.
• Mr. Evans asked if AB 2188 standardized permitting for solar facilities across the state or the region. Mr. Anders informed the EWG that it standardizes permitting across the state in order to be more uniform.

8. UPCOMING MEETINGS (INFORMATION)

The meeting on Thursday, October 23, 2014, is cancelled. The next EWG meeting is scheduled from 11:30 a.m. to 1 p.m. on Thursday, November 20, 2014.

9. ADJOURNMENT

Chair Orlando adjourned the meeting at 12:47 p.m.
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<th>REPRESENTATION</th>
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<td>City of San Marcos</td>
<td>Hon. Chris Orlando, Chair</td>
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## OTHER ATTENDEES:
Noah Alvey, County of San Diego
Kimberly Burke, SDG&E
Kristen Crane, City of Del Mar
Crista Curtis, OPTERRA
Jeremy Hutman, Renewable Funding
Sachiko Kohatsu, County of San Diego BOS District 3
Elizabeth McCollum, TRC
Jim McCollum, Solar Turbines
Joel Pointon, SDG&E
Brendan Reed, City of Chula Vista
Cesar Rios, County of San Diego
Warren Ruis, SDG&E
Thomas Sepulvado, Representative Juan Vargas' Office
John Wotzka, member of public
Jeff Wyner, City of Escondido
Susan Freedman, SANDAG
Anna Lowe, SANDAG
Michelle Martinez, SANDAG
Rob Rundle, SANDAG
Sarah Strand, SANDAG
Allison Wood, SANDAG

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<tr>
<th>Energy Non-Profits</th>
<th>Center for Sustainable Energy</th>
<th>Len Hering</th>
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<td>Jack Clark</td>
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<td>Energy Policy Initiatives Center, University of San Diego School of Law</td>
<td>Scott Anders, Vice Chair</td>
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ENERGY ROADMAP PROGRAM SURVEY RESULTS

Introduction

Since 2010, the Energy Roadmap Program (Program) has provided SANDAG member agencies with no cost energy assessments and energy management plans, or “Energy Roadmaps.” Each Energy Roadmap provides a framework for a local government to reduce energy use in municipal operations and in the community, and can result in economic savings and environmental benefits. The Program is a Local Government Partnership (LGP) with San Diego Gas & Electric (SDG&E). Staff provided an update to the Regional Energy Working Group (EWG) at the July meeting. Today, staff will present results from a survey administered earlier this year to each roadmap city.

Background

Through the Program, SANDAG works with the sixteen jurisdictions in the San Diego region that do not have LGPs with SDG&E. To date, all jurisdictions are participating in the Program, with only a few awaiting finalization of their Energy Roadmap reports. Once cities have roadmap reports, they make the determination on which recommendations to implement. With the Program extended through 2015, SANDAG plans to continue efforts that assist member agencies with implementation of their Energy Roadmaps through building retrofits, technical support from an energy engineering firm, energy and climate change planning, and/or assistance with applying for funding opportunities.

In March 2014, a brief satisfaction survey was sent electronically to two staff representatives from each roadmap city. The survey was prepared in order to gain input from cities on the energy-related programs and services that were of most use to them. The survey also elicited input on program needs or gaps that could be better addressed in the coming year, and will help prioritize services to best meet the needs of the sixteen municipalities.

These cities are:

- City of Carlsbad
- City of Coronado
- City of Del Mar
- City of El Cajon
- City of Encinitas
- City of Escondido
- City of Imperial Beach
- City of La Mesa
- City of Lemon Grove
- City of National City
- City of Oceanside
- City of Poway
- City of San Marcos
- City of Santee
- City of Solana Beach
- City of Vista
**Survey Results**

Out of the thirty-two staff members that the survey was sent to, thirteen participated from eleven different cities, including representation from each SANDAG defined subregion. The survey questions (included as Attachment 1) asked how cities would rate the Program overall, what particular services were of most benefit, and what future type of support would be desired. The survey results showed a positive response to the Energy Roadmap Program and overall, cities found the program helpful. The engineering assessments and support with municipal retrofit projects was identified as most useful, followed by support with energy and climate action planning. Similarly, respondents were most interested in continued assistance in these areas and others. In the future, many cities would like to see programs for their community dealing with home energy upgrades, energy project finance programs, and water efficiency.

The most useful components were identified as:

- Technical assistance on building assessments/energy engineering services
- Support for building retrofits
- Climate planning assistance

**Next Steps**

SANDAG and SDG&E are preparing a contract amendment and budget to extend the SANDAG LGP through 2015. In addition, the California Public Utilities Commission (CPUC) Decision 14-10-046 within its energy efficiency proceeding R.13-11-005, gave the investor-owned utilities the ability to renew LGP contracts on an annual basis for ten years, or until the CPUC establishes guidelines for developing future programs. SANDAG is planning to continue its existing LGP and provide energy resources to local governments through the Energy Roadmap Program. Similarly, SANDAG will work with the local governments to develop potential additional programs in the future.

Attachment: 1. Energy Roadmap Survey Questions

Key Staff Contact: Michelle Martinez, (619) 699-1932, michelle.martinez@sandag.org
ENERGY ROADMAP SURVEY QUESTIONS

SANDAG’s Energy Roadmap Program is being extended for another year through 2015 and we want to budget for services that will best meet your needs on energy-related activities. Also, the state is planning now for 2016, and there are opportunities to bring more community-facing energy efficiency programs to our region. To gain input on what you/your city is most interested in, we have prepared this informal survey. SANDAG will use your input to identify program needs/gaps and inform future program offerings to local governments. Your input is valuable to help ensure the Energy Roadmap Program provides relevant services and support.

1. Overall, do you/your city find the Energy Roadmap Program helpful?
   - [ ] Yes
   - [ ] No
   - [ ] Don’t know

2. Which elements of the Energy Roadmap Program have been most valuable? (Check all that apply.)
   - [ ] Energy engineering assistance (Energy Report Cards of City Buildings, Utility Rate Analysis, Rebate/Incentive options, Cost identification, etc.)
   - [ ] Planning assistance with measures for climate action plans, general plan policies, sustainability goals, alternative fuel and electric vehicles, etc.
   - [ ] Energy-related trainings for municipal staff (Title 24, LEED, building performance, etc.)
   - [ ] Municipal fleet assessment for alternative fuel options
   - [ ] Employee commute information (iCommute)
   - [ ] Peer to Peer and networking meetings
   - [ ] Other

3. For the next 18 months, what type of support are you/your city most interested in from the Roadmap program? (Check all that apply.)
   - [ ] Energy engineering support
   - [ ] Energy incentives/rebates for municipal sites
   - [ ] Energy/climate planning support
   - [ ] Community programs and/or outreach
   - [ ] Factsheet on city’s Roadmap (for the public)
   - [ ] Commuter Programs for municipal employees
   - [ ] Green fleet programs/rebates
   - [ ] Peer to Peer meetings and network opportunities
   - [ ] Other
ENERGY ROADMAP SURVEY QUESTIONS

4. Looking ahead, what other types of programs would you/your city like for your community? (Check all that apply.)

☐ Green Business Network
☐ Home energy upgrades
☐ Energy Project Finance programs
☐ Distributed energy projects (solar, energy storage, fuel cell, microgrid, etc.)
☐ Workforce training
☐ Water efficiency programs
☐ Other

5. If you answered “Other” to any of the earlier questions, or you would like to provide additional feedback, please feel free to elaborate on this question.
Introduction

Obtaining permits for energy projects can be a costly and onerous process. Efforts are underway in the San Diego region and across the state to streamline and make consistent the permitting processes related to various energy upgrades. The Center for Sustainable Energy (CSE) will present on statewide and regional efforts related to permitting for solar rooftop systems; heating, ventilation, and air conditioning (HVAC); and electric vehicle (EV) charging stations.

Discussion

Working toward regional consistency and streamlined permitting processes helps to implement the following two key Priority Early Actions from the Regional Energy Strategy (RES):

- Pursue a comprehensive building retrofit program to improve efficiency and install renewable energy systems.
- Support planning of electric charging and alternative fueling infrastructure.

In addition, these permitting efforts also support the following Broad Strategy to Implement Multiple Goals identified in the RES:

- Develop standardized approaches and programs that can be implemented by all member agencies.

Permitting Resources Available

CSE is working with local governments, contractors, and other stakeholders to improve and standardize local permitting processes. CSE staff will describe the resources available to local governments. Background information on key programs is included in the attachments to this report:

- Attachment 1 describes the California Solar Permitting Guidebook
- Attachment 2 is a factsheet on HVAC Permitting Compliance and Financing
- Attachments 3 and 4 are resources developed by the San Diego Regional EV Infrastructure Working Group (REVI). Additional REVI resources, and the full San Diego Regional Plug-in Electric Vehicle (PEV) Readiness Plan is available at: sandag.org/index.asp?classid=17&subclassid=46&projectid=413&fuseaction=projects.detail.
Next Steps

CSE continues to offer assistance to local governments on implementing recommendations from these programs. Additionally, SANDAG and CSE recently partnered on an application to the California Energy Commission for continued resources to implement the PEV Readiness Plan in the San Diego region. EWG members will continue to receive updates on these and future programs.

Attachments:  
1. California Solar Permitting Guidebook Factsheet  
2. Heating, Ventilation, and Air Conditioning Permitting Compliance and Financing Pilots Factsheet  
3. Plug-in Electric Vehicles: Resources for Public Agencies  
4. Electric Vehicle Charging Station Installation Guidelines: Residential and Commercial Locations

Key Staff Contact: Allison Wood, (619) 699-1973, allison.wood@sandag.org
Improving Permit Review and Approval for Small Solar Systems

This Guidebook provides a roadmap for establishing streamlined permitting processes for small, solar rooftop systems. Adopting the recommendations for solar permitting will result in reduced processing times and increased throughput for local governments as well as facilitating local economic development. Increasing solar is a key component for many jurisdictions in achieving goals set for climate action plans.

Designed for both code officials and solar installers, the Guidebook draws upon best practices and experiences of various California cities and expertise from regulatory agencies, solar companies, program implementers and the building industry.

“Standard plans are great tools that can help achieve a streamlined and efficient permitting process. Their adoption can greatly help achieve consistency among jurisdictions in permitting of solar PV systems.”

- Osama Younan, Green Building Division Chief, City of Los Angeles

Guidebook Set as AB 2188 Reference

California Assembly Bill 2188 requires cities and counties to adopt an expedited solar permitting process and cites the Guidebook as the primary resource for conforming to the new requirements.

Expertise and training is available for code officials and solar contractors wanting technical assistance in meeting AB 2188 standards and using the California Solar Permitting Guidebook. For information, contact Claudia.Eyzaguirre@energycenter.org.

Expedited Solar Permitting Toolkit

The Guidebook offers seven standardized documents that serve as templates for creating uniform and expedited permitting for small-scale solar.

- Eligibility checklist for systems <10 kw
- Simplified applicant submittal requirements
- Standard electrical plans (2) with fire access requirements
- Well-defined structural criteria for expedited permitting
- An inspection reference guide
- One bulletin with state codes for solar installations

View the Guidebook

www.energycenter.org/solarguidebook

The guidebook was developed by the Governor’s Office of Planning and Research in partnership with the Center for Sustainable Energy, California Building Standards Commission, Department of Housing and Community Development and the State Fire Marshal. It was developed with funding through Department of Energy’s SunShot Initiative.
Engaging local government building departments in streamlining HVAC permitting

The Center for Sustainable Energy, with funding from the California Energy Commission and in partnership with The Energy Network, is asking local building departments to help identify solutions that improve residential heating, ventilation and air conditioning (HVAC) permit compliance in California.

Why focus on permit streamlining?

- More efficient permit processes encourage compliance
- A gateway for regional compliance consistency
- Allows for better tracking of energy savings tied to HVAC change-outs
- Ensures safe and proper installations
- Levels the playing field for contractors who follow the rules

A streamlined HVAC permitting process can reduce the time and resources local governments spend processing permits. Faster permit processing results in increased throughput for building departments and increased economic development in the community.

“...an estimated 90% of residential central HVAC replacements [in California] are being done without a permit...”


More information at www.energycenter.org/programs/hvac_pilots
Local Building Department Working Groups

In fall 2014, the Center for Sustainable Energy hosted working group meetings in San Diego, Los Angeles and the Inland Empire to present findings of the HVAC Permit Compliance Survey. The survey asked HVAC industry stakeholders to provide feedback on the residential HVAC alteration permit processes and compliance trends. The meetings also allowed building department staff to share and vet Title 24, Part 6 compliance barriers and best practices.

During **November 10-14 and 17-21**, a second round of local government working groups will be held in the San Diego, Orange, Los Angeles and Inland Empire regions. These meetings will be one-on-one opportunities for CSE staff and building department officials to discuss best practices and permit compliance strategies that are most efficient for their jurisdiction. The resulting information will be incorporated into the HVAC Permitting Best Practices Guide along with a model compliance toolkit to help building departments streamline their permit processes and achieve Title 24, Part 6 compliance.

Who Should Participate

Chief building officials, building inspectors, plan examiners, permit staff/technicians, planners and any other local government staff invested in tracking energy reduction and efficiency.

Set up a Meeting

To schedule a one-on-one HVAC working group with CSE, contact Marissa Spata at Marissa.Spata@energycenter.org or (858) 737-1584.

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**HVAC Permit Compliance Survey (March 2014)**

- 54 Southern California building departments
- 94 contractors, raters and permit runners

**Six Main Focus Areas**

1. Barriers to pulling permits
2. Building department resources
3. Compliance documentation
4. Permit tracking
5. Reach codes
6. Training

**Center for Sustainable Energy**

The Center for Sustainable Energy is a nonprofit organization that accelerates the transition to a sustainable world powered by clean energy. The center helps consumers, businesses, governments and others adopt energy efficiency, renewable energy and clean transportation technologies. Learn more at www.energycenter.org.
Plug-in Electric Vehicles

Resources for Public Agencies in San Diego

Plug-in electric vehicles (PEVs) are becoming more common, and local permitting agencies should be prepared for the growing PEV market and understand how PEVs can help agencies achieve climate and sustainability goals. This fact sheet was developed by the San Diego Regional Electric Vehicle Infrastructure (REVI) working group and offers San Diego’s public agencies resources and technical training information as they become PEV ready.

PEV Readiness Toolkit

The California PEV Collaborative offers numerous resources for local government officials on state and federal incentives for PEVs and electric vehicle supply equipment (EVSE). The PEV Readiness Toolkits include quick references for developing municipal planning and community development policies to support and promote PEVs. Visit http://www.pevcollaborative.org/policy-makers.

Building Support - engineers, plan checkers, project managers, and building officials

Permitting

Electric vehicle charging systems are relatively new to permitting departments and are often permitted through existing processes and permits. The Cities of Oceanside and San Diego have developed guidance documents to aid with the permitting, installation, and inspection processes.

- City of Oceanside Residential Electric Vehicle Charger Guidelines
  http://www.ci.oceanside.ca.us/civica/filebank/blobdload.asp?BlobID=30053
- City of San Diego Information Bulletin 187: How to Obtain a Permit for Electric Vehicle Charging Systems
- The PEV Collaborative has developed Streamlining the Permitting and Inspection Process for Plug-in Electric Vehicle Home Charger Installations, which includes statewide codes and standards, recommended permitting fees, and background information on EVSE hardware.
- Department of Energy’s Alternative Fuels Data Center EVSE permitting template for jurisdictions
  http://www.afdc.energy.gov/pdfs/EV_charging_template.pdf

Regional Permit Fees

From mid-2011 to early 2013, the EV Project reported that the median cost for permitting a residential EVSE installation was $226. Permitting fees vary by jurisdiction, so it is a good idea to contact the permitting agency for specific fees.

Building & Electrical Codes

The National Electrical Contractors Association provides a common set of electric vehicle terminology and code in the presentation linked below. Pacific Gas & Electric offers a condensed version of code requirements for EVSE installations, from disability requirements to PEV signage, at


Planning Department Staff - planners

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1 http://energycenter.org/programs/pev-planning/san-diego
3 http://iaei-western.org/Files/2011/Programs/NECA%20EVSE%20Presentation%20NECA%205D%202011%20Western%201AE%20Section.pdf
Addressing Accessibility for PEV Chargers
Assuring charging systems are accessible to all drivers is critical for public adoption. The Office of Planning and Research (OPR), in conjunction with the Department of the State Architect, is developing a guidance document to help public agencies standardize accessibility opportunities for PEV charging. To view or download copies of the draft guidelines, visit http://opr.ca.gov/docs/PEV_Access_Guidelines.pdf.

The City of San Diego has developed a comprehensive technical policy guide addressing accessibility and PEV parking at https://www.sandiego.gov/development-services/pdf/industry/tpolicy11b1.pdf.

Parking Guidelines

Parking Enforcement
The City of Santa Monica has adopted an electric vehicle parking ordinance. This ordinance offers an example for other local agencies interested in incorporating and enforcing PEV parking into existing policy documents.

- 3.12.835 Electric vehicle parking (adopted at Santa Monica City Council Meeting 07/24/2012)4

The California Department of Motor Vehicles has codified electric vehicle parking enforcement with Vehicle Code (VC) Section 22511 Off-Street Parking: Electric Vehicle, a standard template available for use by local jurisdictions.6

PEV Signage
The California Manual on Uniform Traffic Control Devices has released a statewide traffic operations policy directive on zero-emission vehicle signs and pavement markings standardizing signs and markings for PEV charging stations and parking stalls.5

Safety Training for First Responders
Firefighters, police officers and other first responders encounter PEVs when responding to incidents. For their safety and the safety of the public, it is essential that they receive PEV training.

National Alternative Fuels Training Consortium – First responder safety training http://afvsafetytraining.com
Miramar College: Advanced Transportation Technology and Energy Program (ATTE) - Technical education, training and resources http://www.attemiramar.com/
First Responder Guides for Tesla Vehicles http://www.teslamotors.com/firstresponders

6 http://www.dmv.ca.gov/pubs/vctop/d11/vc22511.htm
Electric Vehicle Charging Station Installation Guidelines: Residential and Commercial Locations

Streamlining Permitting and Inspection of Residential and Commercial Electric Vehicle Charging Station Installations

Purpose

With the growing adoption of plug-in electric vehicles (PEVs) there is increasing need for installing both residential and commercial charging stations, also known as electric vehicle supply equipment (EVSE). Jurisdictions can use this guide as a template to provide straightforward information to homeowners and electrical contractors about residential and commercial EVSE permitting requirements. Within the San Diego region, jurisdictions 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 purchased will determine the way people charge their vehicles. Homeowners may plug their vehicles into a conventional 120-volt household outlet or install a 240-volt circuit for faster charging.

PEVs come with a 120-volt charging cord that enables owners to charge their vehicle with a conventional outlet (Level 1 charging). This is a very practical solution for owners of plug-in hybrid electric vehicles (PHEVs), such as a Toyota Plug-in Prius or Chevrolet Volt.

A person who purchases a battery electric vehicle (BEV), such as the Nissan Leaf, may choose to use a Level 2 charging station. Level 2 chargers use 240 volts and cut the charging time by about one-half compared with 120 volt charging. Level 2 charging generally requires 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.

The following table illustrates the charging time associated with the most popular BEVs and PHEVs on the market.

<table>
<thead>
<tr>
<th>Charging Level</th>
<th>Power Supply</th>
<th>Charger Power</th>
<th>Miles/Hour of Charge</th>
<th>Type of PEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>120VAC</td>
<td>1.4 kW (onboard charger)</td>
<td>~3-4 miles</td>
<td>~17 hours</td>
</tr>
<tr>
<td>Level 2</td>
<td>240VAC</td>
<td>3.3 kW (onboard charger)</td>
<td>~8-10 miles</td>
<td>~7 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.6 kW (onboard charger)</td>
<td>~17-20 miles</td>
<td>~3.5 hours</td>
</tr>
</tbody>
</table>

Source: California PEV Collaborative

What do I need to provide to obtain an installation permit?

Residential EVSE Permits

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

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1 Adapted from the City of Riverside’s ELECTRIC VEHICLE CHARGER INSTALLATION GUIDELINES and the City of Oceanside’s Residential Electric Vehicle Charger Guidelines

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 residential EVSE and wiring methods based on the California Electrical Code (see sample electrical plan)
Electrical Plans | Single-line diagrams showing the system, point of connection to the power supply and the EVSE
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 (CEC), Article 220, are required if the existing service panel is rated less than 200 amps. Electrical panel upgrades and electrical wiring must be in conformance with the current edition of the 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 considerations for commercial EVSE.

- Zoning Requirements
- Community or Design Guidelines
- Existing Use Permits
- Electrical Source/Metering
- Parking and Signage 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 electrical permit. A more complex commercial installation may require a modification to an existing use permit or site plan addressing specific community or zoning design criteria. It is important to meet with staff at the jurisdiction’s building department and, if necessary, planning department, to understand fully all of the requirements and fees prior to submitting permits.

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

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 homeowner or property owner (or tenant) needs to be present during the inspection so that the inspector can access the charging station location and review any other electrical or structural change. See the attached EVSE Inspection Checklist, which is designed to serve as a guide for local building inspectors and is endorsed by the National Electrical Contractors Association. A residential checklist used in the cities of Oceanside and San Diego is also included.

How do I install a charging station?

Residential Installations

Installing residential EVSE may require changes to the home’s electrical wiring and prompt selecting different utility electricity rates.
For a step-by-step installation guideline, 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](http://www.GoElectricDrive.com).

**Commercial Installations**

Commercial EVSE installations are often specific to the location and the proposed use. 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?**

San Diego Gas & Electric (SDG&E) needs to accurately track the number of PEV charging stations installed to properly plan for local increases in electricity demand due to vehicle 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 and identify potential EVSE rebates and incentives.

**Load Level of Residential Charging**

SDG&E’s Clean Transportation Program 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 9.6 kW may double or triple a household’s prior peak load. In addition, PEV owners who notify SDG&E of a residential EVSE installation will learn about their PEV time-of-use (EV TOU) rates that provide a significantly lower electricity cost of for PEV owners who charge at night, when demand is lower.

![Load Level of Residential Charging Diagram](image)

Source: San Diego Gas & Electric

Visit SDG&E’s [Electric Vehicles](http://ElectricVehicles) website for more information about their EV programs.
### 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)

<table>
<thead>
<tr>
<th>Item</th>
<th>EVSE Inspection Activity</th>
<th>Code Reference</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>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.</td>
<td>Local Regulations and NEC 90.8, 220.12, 220.14, 220.16, 220.82</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Verify that the EVSE is listed by an NRTL and installation instructions are provided.</td>
<td>NEC 90.7, 625.5, 110.3(B)</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Verify the EVSE location and that it is securely fastened to the structure and guarded from physical damage as required.</td>
<td>NEC 110.13, 110.27(B), 625.29, 625.30</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>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.</td>
<td>NEC 110.3(B), 625.13, 625.18, 625.19, 625.29</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>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.</td>
<td>NEC Article 100 continuous load, 210.19(A)(1), 215.2(A), 625.21</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>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.</td>
<td>NEC 300.11 and the applicable .30 section of article</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Verify the size of the branch circuit overcurrent protection is per nameplate and protects the conductors.</td>
<td>NEC 110.3(B), 240.4</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>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.</td>
<td>NEC 210.19(A)(1), 215.2(A), 110.3(B), Table310.15(B)(16), 310.15(B).</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>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.</td>
<td>NEC 250.110, 250.112, 250.114, 250.120, 300.3(B), 250.119, 250.122.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check the electrical connections of the circuit conductors and equipment grounding conductor connections.</td>
<td>NEC 110.14, 250.148(A) Annex I</td>
<td></td>
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<td>-------------------------------</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Verify disconnecting means is provided and properly located for EVSE rated greater than 60 amperes and 150 volts.</td>
<td>NEC 625.23</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Verify installation of EVSE is in a neat and workmanlike manner.</td>
<td>NEC 110.12, NECA 1, NECA 413</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>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)</td>
<td>NEC 230.31, 230.42, 310.15(B)(7) and Table 310.15(B)(7)</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Verify circuit breaker compatibility with existing panelboard or service equipment. Must be manufactured by the panelboard or service equipment manufacturer.</td>
<td>NEC 110.3(B), Article 240 Part VII, Article 408 part I</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Branch circuit device and any disconnects must be identified as to the use.</td>
<td>NEC 408.4(A), 110.22(A)</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Where separate utility metering and enclosures are installed, verify NEC compliance for service equipment and conformance to applicable utility regulations.</td>
<td>Utility company regulations and NEC Article 230</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Verify equipment is suitable for connection to the line side of the service disconnecting means.</td>
<td>NEC 230.82</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Verify sufficient working space is provided at EVSE, Panelboards, service equipment, and disconnects.</td>
<td>NEC 110.26</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Verify additional service disconnects (if installed) are grouped.</td>
<td>NEC 230.72</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Verify the maximum number of service disconnects has not been exceeded</td>
<td>NEC 230.71</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Verify that any additional service disconnect is properly rated.</td>
<td>NEC 230.79</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Verify the wiring method used for the additional service conductors installed.</td>
<td>NEC 230.43</td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Verify that additional service disconnects are properly identified.</td>
<td>NEC 230.70(B)</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>Verify service disconnect is listed as suitable for use as service equipment.</td>
<td>NEC 230.70(C)</td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>Verify the overcurrent protection for any newly installed service equipment and conductors.</td>
<td>NEC 230.90, 230.91</td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>Verify grounded conductor (neutral) is brought to the service disconnect and bonded to the enclosure.</td>
<td>NEC 250.24(C)</td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>Verify metal service equipment enclosures and raceways are bonded together effectively.</td>
<td>NEC 250.92, 250.92(B)</td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>Supply-side bonding jumpers are sized properly</td>
<td>NEC 250.102(C), 250.66</td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>Verify existing service grounding and bonding.</td>
<td>NEC 250.50, 250.104(A) and (B) and NECA Articles 702 and 705</td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>Verify EVSE that is intended to be used as interactive systems, bi-directional, or optional standby systems be listed for that purpose.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*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.)

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

*(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).**

<table>
<thead>
<tr>
<th>Total Watts Used</th>
<th>Minimum Required Size of Existing 240 Volt Electrical Service Panel (Main Service Breaker Size)</th>
<th>Identify the Size of Your Existing Main Service Breaker (Amps)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 24,000</td>
<td>60 amp</td>
<td></td>
</tr>
<tr>
<td>24,001 to 48,000</td>
<td>100 amp</td>
<td></td>
</tr>
<tr>
<td>48,001 to 63,000</td>
<td>125 amp</td>
<td></td>
</tr>
<tr>
<td>63,001 to 78,000</td>
<td>150 amp</td>
<td></td>
</tr>
<tr>
<td>78,001 to 108,000</td>
<td>200 amp</td>
<td></td>
</tr>
<tr>
<td>108,001 to 123,000</td>
<td>225 amp</td>
<td></td>
</tr>
</tbody>
</table>

**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: ____________________________________________ (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.

<table>
<thead>
<tr>
<th>Size of EV Charger Circuit Breaker</th>
<th>Required minimum size of Conductors (THHN wire)</th>
<th>Electrical Metallic Tubing (EMT)</th>
<th>Rigid Nonmetallic Conduit – Schedule 40 (RNC)</th>
<th>Flexible Metal Conduit (FMC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 amp</td>
<td>#12</td>
<td>1/2”</td>
<td>1/2”</td>
<td>1/2”</td>
</tr>
<tr>
<td>30 amp</td>
<td>#12</td>
<td>1/2”</td>
<td>1/2”</td>
<td>1/2”</td>
</tr>
<tr>
<td>40 amp</td>
<td>#10</td>
<td>1/2”</td>
<td>1/2”</td>
<td>1/2”</td>
</tr>
<tr>
<td>50 amp</td>
<td>#8</td>
<td>3/4”</td>
<td>3/4”</td>
<td>3/4”</td>
</tr>
<tr>
<td>60 amp</td>
<td>#6</td>
<td>3/4”</td>
<td>3/4”</td>
<td>3/4”</td>
</tr>
<tr>
<td>70 amp</td>
<td>#6</td>
<td>3/4”</td>
<td>3/4”</td>
<td>3/4”</td>
</tr>
</tbody>
</table>

***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.

<table>
<thead>
<tr>
<th>Conduit Support</th>
<th>Electrical Metallic Tubing (EMT)</th>
<th>Rigid Nonmetallic Conduit – Schedule 40 (RNC)</th>
<th>Flexible Metal Conduit (FMC)</th>
<th>Nonmetallic Sheathed Cable (NMC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduit Support Intervals</td>
<td>10’</td>
<td>3’</td>
<td>4-1/2’</td>
<td>4-1/2’</td>
</tr>
<tr>
<td>Maximum distance from box to conduit support</td>
<td>3’</td>
<td>3’</td>
<td>1’</td>
<td>1’</td>
</tr>
</tbody>
</table>

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.