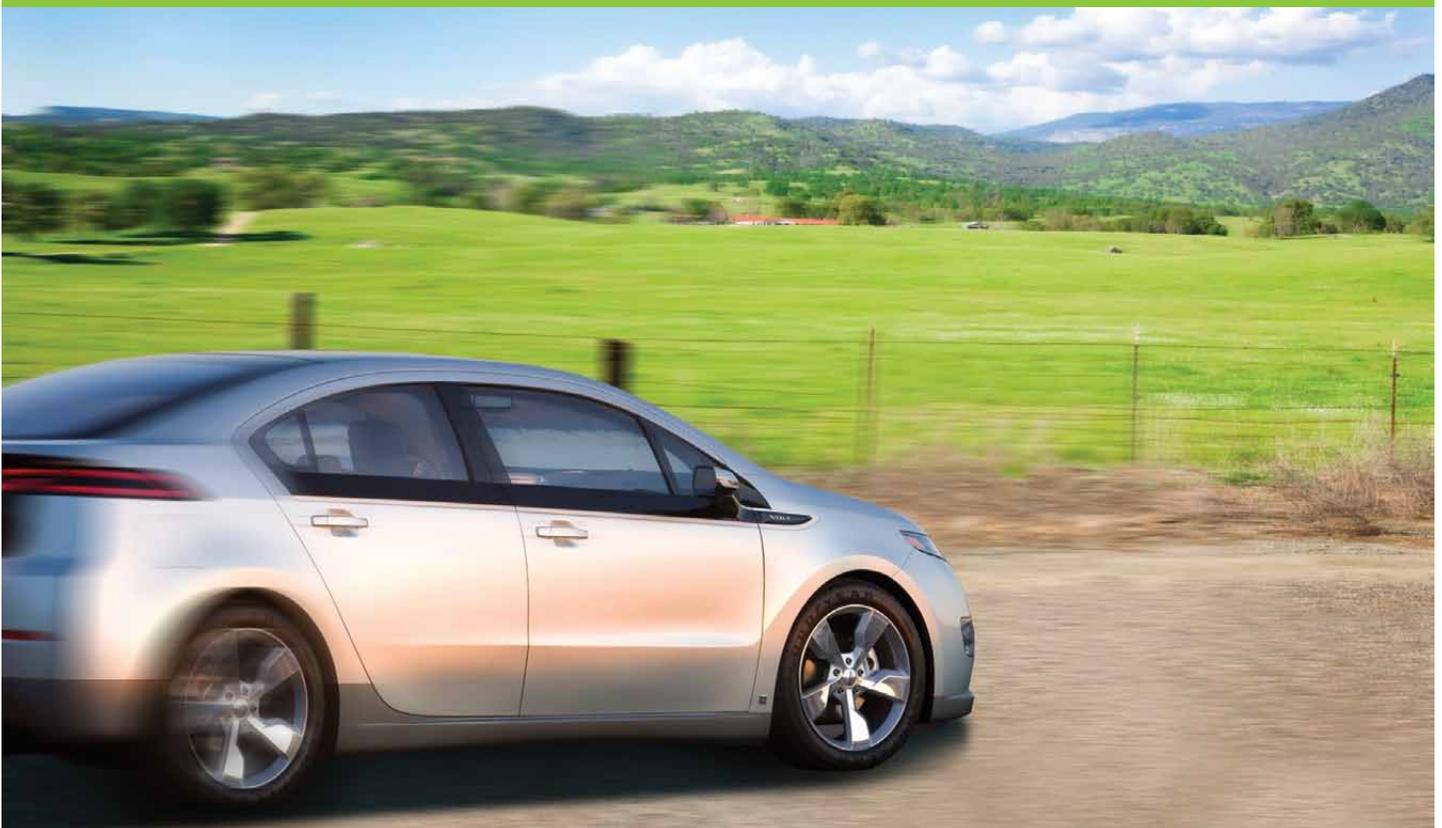


San Joaquin Valley
PLUG-IN ELECTRIC VEHICLE (PEV) READINESS PLAN

Phase One Regional PEV Assessment



Acknowledgements

The California Center for Sustainable Energy gratefully appreciates the feedback and guidance of the many stakeholders throughout the San Joaquin Valley who contributed to this Assessment.

Government Agencies/Regional Partners:

Bay Area Air Quality Management District
California Energy Commission
Fresno COG
Kern County of Governments
Merced CAG
Office of Governor Jerry Brown
Sacramento Area Council of Governments
San Joaquin COG
San Joaquin County Fleet Services
San Joaquin County Office of Education
San Joaquin Valley Air Pollution Control District
San Joaquin Valley Clean Cities Coalition
South Coast Air Quality Management District
Tulare CAG
United States Department of Energy
University of California, Davis Plug-In Hybrid & Electric Vehicle Research Center

Nonprofits:

Ameri-Skills
EV Infrastructure Training Program
California Employment Training Panel
Community Environmental Council
Plug In America
Plug-in Electric Vehicle Collaborative

Utility Service Providers:

Lodi Electric
Merced Irrigation District
Pacific Gas & Electric
Modesto Irrigation District
Southern California Edison
Turlock Irrigation District

Participating San Joaquin Valley Jurisdictions:

City of Arvin	City of Modesto
City of Bakersfield	City of Newman
City of Clovis	City of Orange Cove
City of Coalinga	City of Patterson
City of Fresno	City of Sanger
City of Kingsburg	City of Stockton
City of Lemoore	City of Taft
City of Lodi	City of Tracy
City of Madera	City of Tulare
City of McFarland	City of Turlock
City of Manteca	City of Visalia
City of Merced	County of San Joaquin

Private Industry:

ECOtality
General Motors
Nissan
Three-Way Chevrolet

The participants who contributed to this report represent numerous and diverse stakeholder entities. No participant should be deemed to endorse or support all of the conclusions or recommendations contained in this report.

Disclaimer

This report was prepared as a result of work sponsored, paid for, in whole or in part, by a U.S. Department of Energy (DOE) Award to the San Joaquin Valley Air Pollution Control District (APCD). The opinions, findings, conclusions, and recommendations are those of the author and do not necessarily represent the views of APCD or the DOE. The APCD and DOE, their officers, employees, contractors, and subcontractors make no warranty, expressed or implied, and assume no legal liability for the information in this report. The APCD and DOE have not approved or disapproved this report, nor have the APCD or DOE passed upon the accuracy or adequacy of the information contained herein.

HOW TO USE THIS DOCUMENT

The San Joaquin Valley PEV readiness assessment is designed to enhance local PEV planning efforts by evaluating the current state of PEV readiness and identifying potential areas of improvement as well as tangible best practices developed throughout the San Joaquin Valley, California and abroad. **This document was designed for local government staff including planners, code officials and building inspectors.**

The primary focus of this assessment is on the installation of PEV charging infrastructure, or electric vehicle supply equipment (EVSE). The first three sections of this document provide basic information on PEVs, an overview of the deployment of PEVs and EVSE across the San Joaquin Valley and a summary of incentive programs for San Joaquin Valley businesses, residents and public agencies. Subsequently, the assessment focuses on the following five core actions critical to preparing municipalities for PEVs.

SECTION 5: ZONING AND PARKING (pp. 19–24)

SECTION 6: PERMITTING AND INSPECTION (pp. 25–31)

SECTION 7: BUILDING CODES (pp. 33–37)

SECTION 8: TRAINING AND EDUCATION (pp. 39–41)

SECTION 9: OUTREACH TO LOCAL BUSINESSES AND RESIDENTS (pp. 43–45)

Each section is designed to stand on its own, allowing municipal staff to focus only on areas that are relevant to their work. For example, agency staff involved in developing or updating municipal codes are encouraged to refer directly to Section 7: Building Codes. However, we encourage municipal staff in the San Joaquin Valley to utilize all sections in this assessment.

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EXECUTIVE SUMMARY

Introduction

During 2012, the San Joaquin Valley Air Pollution Control District (SJVAPCD) received Department of Energy (DOE) funding to prepare for the adoption of plug-in electric vehicles (PEVs). This report is the project's first phase and contains an evaluation of how prepared San Joaquin Valley jurisdictions are for PEV deployment.

This assessment concentrates on the installation of PEV charging infrastructure, or electric vehicle supply equipment (EVSE). The first three sections provide basic PEV information, an overview of PEV and EVSE deployment and a summary of incentive programs for San Joaquin Valley businesses, residents and public agencies. Subsequently, the focus is on five critical core areas:

- ① Updating zoning and parking policies
- ② Streamlining permitting and inspection processes
- ③ Updating building codes for electric vehicle supply equipment (EVSE)
- ④ Training and education programs for municipalities and EVSE installers
- ⑤ Municipal PEV outreach and education programs for local residents and businesses

Key PEV Readiness Recommendations

For each core area, we have identified recommendations based on regional and external best practices. These recommendations address policy gaps and are intended to assist municipalities in becoming more PEV ready. It is important to recognize that each recommendation builds off extensive research and interaction with municipalities throughout the region.

Core Area #1: Updating Zoning and Parking Policies (pp. 19–24)

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

Core Area #2: Streamlining Permitting and Inspection Processes (pp. 25–31)

- Establish and adopt regional EVSE permitting and inspection guidelines for residential EVSE installations
- Develop express permitting for simple residential EVSE installations, waive plan check requirement for these permits

- Develop EVSE permit municipality-utility communication channel, increasing utility knowledge of additional electricity load of PEVs in the San Joaquin Valley

Core Area #3: Updating Building Codes for EVSE Deployment (pp. 33–37)

- Expand understanding of building code revision timelines and processes
- Modify existing use/discretionary permitting processes to include EVSE prewiring language
- Adopt/update prewiring for EVSE in residential and nonresidential new construction

Core Area #4: Training and Education Programs for Municipalities and EVSE Installers (pp. 39–41)

- Implement at least two PEV readiness trainings for regional municipal staff
- Leverage regional alternative fuel training funding to implement PEV infrastructure training for EVSE installers
- Coordinate and expand DOE-funded safety training for emergency first responders in the San Joaquin Valley

Core Area #5: Municipal PEV Outreach to Local Residents and Businesses (pp. 43–45)

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

Regional Next Steps

The second phase of this project, funded by the California Energy Commission, will establish the San Joaquin Valley Plug-in Electric Vehicle Coordinating Council (SJV PEVCC). The SJV PEVCC will be comprised of representatives from local governments, public agencies, utilities, industry and the nonprofit sector.

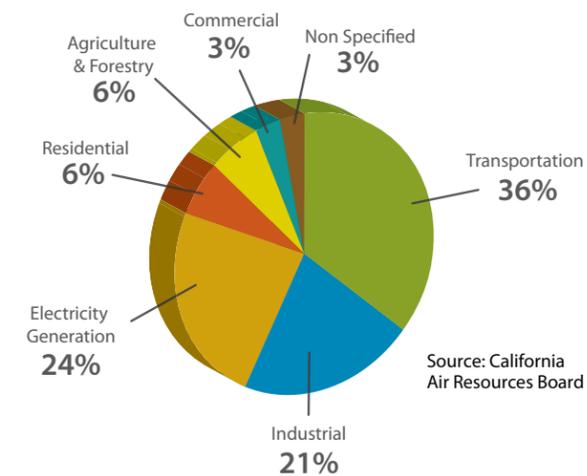
This council will leverage the recommendations listed here to develop a comprehensive San Joaquin Valley PEV readiness plan that identifies, reduces and resolves barriers to the widespread deployment of private and public PEV charging stations throughout the San Joaquin Valley.



SECTION 1: INTRODUCTION

The San Joaquin Valley's unique geography, emissions from both northern and southern California as well as air pollution from regional population growth collectively create significant challenges to the region's air quality. Transportation continues to be one of the largest contributors to air pollution in the San Joaquin Valley. With respect to smog-forming oxides of nitrogen (NO_x), nearly 60% are directly attributed to cars and trucks on the road today. Data on greenhouse gas emissions in the San Joaquin Valley is not available, however in California approximately 40% of this pollution comes from the transportation sector.

California Greenhouse Gas Emissions



As a result of progressive leadership from the San Joaquin Valley Air Pollution Control district, statewide emission levels have dropped significantly since 1990. However, sharp emission reductions in the transportation sector are essential in order for this trend to continue. While not the only method, the increased deployment of plug-in electric vehicles (PEV) is a key strategy to realizing reduced emissions, providing a necessary pathway to improved air quality for all residents in the San Joaquin Valley.

During the past year, the San Joaquin Valley region has received funding from the Department of Energy (DOE) and the California Energy Commission (CEC). This report is the first phase of this project, funded from the DOE, and includes an assessment evaluating

how prepared municipalities in the San Joaquin Valley are for PEV deployment focusing on the following five core elements:

- ① Updating zoning and parking policies
- ② Streamlining permitting and inspection processes
- ③ Updating building codes for electric vehicle supply equipment (EVSE)
- ④ Training and education programs for municipalities and EVSE installers
- ⑤ Municipal PEV outreach and education programs for local residents and businesses

The California Center for Sustainable Energy (CCSE) has led the first phase of this project, with broad interaction with stakeholders throughout the region. These stakeholders include the San Joaquin Valley Air Pollution Control District (SJVAPCD) and the San Joaquin Valley Clean Cities organization. Additionally, CCSE has conducted surveys for jurisdictions throughout the region as well as extensive research regarding policies and strategies focused on expanding PEV deployment.

Transportation in the San Joaquin Valley is responsible for ~60% of smog forming NO_x.

It is important to note that this assessment is part of larger efforts to prepare municipalities throughout the San Joaquin Valley for the deployment of PEVs. The second phase of this project, funded from the CEC, was awarded to the SJVAPCD and CCSE. Through this grant, SJVAPCD and CCSE will establish the San Joaquin Valley Plug-in Electric Vehicle Coordinating Council. (SJV PEVCC).

SJV PEVCC will be comprised of representatives from local governments, public agencies, utilities, industry and the nonprofit sector. The primary focus of the group is to develop a San Joaquin Valley PEV readiness plan that identifies, reduces and resolves barriers to the widespread

deployment of private and public PEV charging stations, also known as electric vehicle supply equipment (EVSE).



This assessment will assist SJV PEVCC in developing this regional plan, including the five core areas highlighted above as well as the following:

- 6 Challenges to EVSE installation at multiunit dwellings (MUDs)
- 7 Regional planning for EVSE siting
- 8 Working with utilities to manage grid impacts
- 9 Encouraging workplace charging with local employers
- 10 Expanding EVSE installations on public agency-owned property
- 11 Promotion of PEVs in government fleets
- 12 Leveraging renewable energy in PEV charging

It is also important to emphasize that these efforts are tied to larger national and state goals. On the federal level, President Obama has made it clear that the United States is dedicated to developing and deploying PEVs on a large scale. In his 2011 State of the Union address, President Obama called for putting one million electric vehicles on the road by 2015 – affirming and highlighting a goal aimed at building U.S. leadership in technologies that reduce our dependence on oil.¹

The State of California is also rising up to the challenge. In March 2012, Governor Brown issued Executive Order

B-16-2012 that directs the state government to help in significantly expanding the market for zero-emission vehicles (ZEVs) in California, which includes PEVs and fuel cell vehicles. This executive order established several milestones, with the ultimate target of reaching 1.5 million ZEVs in California by the year 2025.² In addition, the governor executed Executive Order B-18-2012 that directs state agencies to “identify and pursue opportunities to provide electric vehicle charging stations, and accommodate future charging infrastructure demand, at employee parking facilities in new and existing buildings.”³

Undoubtedly, local governments will play a critical role in reaching these ambitious goals set by the president and the governor. However, local governments are not expected to establish policies and processes necessary to meet these targets in isolation. This document was developed to assist local governments in the San Joaquin Valley by giving them tools they need to become PEV ready. In addition, ongoing regional efforts will offer more resources to help jurisdictions throughout the San Joaquin Valley continue to provide their residents and local businesses excellent services in a time when municipal budgets are tight.

¹ Department of Energy. “One Million Electric Vehicles by 2015: February 2011 Status Report.” Feb 2011. http://www1.eere.energy.gov/vehiclesandfuels/pdfs/1_million_electric_vehicles_rpt.pdf

² Executive Order B-16-2012, <http://gov.ca.gov/news.php?id=17472>

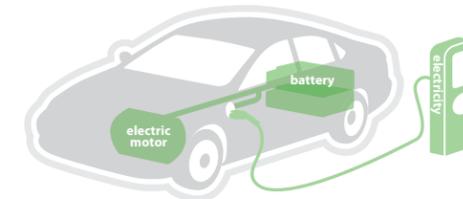
³ Executive Order B-18-2012, <http://gov.ca.gov/news.php?id=17508>

SECTION 2: PEV 101

What is a PEV and are there different types?

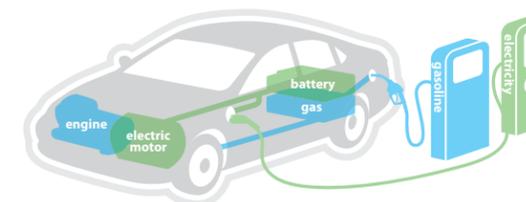
A plug-in electric vehicle (PEV) is a general term for cars that can operate, at least partially, on battery power and that are recharged from the electricity grid. There are two main types of PEVs: battery electric vehicles and plug-in hybrid electric vehicles.

- **Battery electric vehicle (BEV)** — Vehicles that are entirely powered by an electric motor. These vehicles are also known as zero emission vehicles (ZEV) or all-electric vehicles (AEV).



Some examples of BEVs on the market include the Nissan LEAF, CODA, Mitsubishi i-MiEV, Honda Fit EV, Ford Focus Electric, BMW ActiveE, smart ED and Tesla Model S.

- **Plug-in hybrid electric vehicle (PHEV)** — PHEVs can plug into the grid so they can operate on electricity as well as an internal combustion engine.



Some examples of PHEVs on the market include the Chevrolet Volt, Toyota Plug-in Prius and the Ford CMAX Energi.

For more information on available BEVs and PHEVs, visit the PEV Resource Center at www.driveclean.ca.gov/pev.

Are there different types of charging stations?

Different types of chargers are available for plug-in electric vehicles, which generally have a range of 60–120 miles on a single charge. Charging overnight at home should suffice for day-to-day driving, and expanding public infrastructure will provide charging on the road.

- **Level 1 (120 volt)** — PEVs come with a 120-volt charging cord that enables PEV owners to charge their PEV with any conventional 120-volt three-pronged outlet. While it takes longer to charge, Level 1 (L1) allows PEV drivers to plug in without the installation of a dedicated charging station.
- **Level 2 (240 volt)** — This level of charging requires a charging station, also known as electric vehicle service equipment (EVSE), be purchased and installed and generally involves the installation of a dedicated circuit at either the PEV owner’s home or where a public charging station is installed. Currently, Level 2 (L2) EVSE makes up the majority of public charging stations across California.
- **DC Fast Charger (480 volt)** — DC fast charging stations deliver the fastest EV charging rate currently available. Though relatively few are installed in California, there are plans to increase significantly the number of these stations by 2015.⁴

For more information on PEV charging stations currently available on the market, visit www.GoElectricDrive.com.

How long does it take to charge a vehicle?

PEV charging time depends on two primary factors, the size of the battery as well as the onboard charger. As a rule of thumb, BEVs have a larger battery compared to PHEVs. The onboard charger is located in the vehicle and determines the amount of power that can enter the vehicle from the grid.

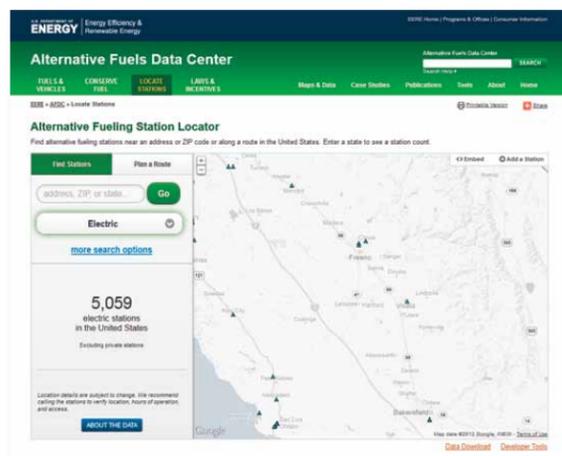
⁴ <http://www.torquenews.com/1075/californias-settlement-nrg-electric-car-charging-network-headed-ferc>

The table⁵ below illustrates the charging time associated with the most popular BEV and PHEV on the market today, the Nissan LEAF and the Chevrolet Volt.

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
DC Fast Charge	200–450 DC	45 kW (off-board)	~50–60 miles	~30 minutes to 80%	Not currently available on PHEVs

Where are public charging stations?

There is an expanding network of Level 2 and DC fast charging stations across the state and the San Joaquin Valley region. For more information on where these charging stations are located, visit the DOE Alternative Fuel Data Center at www.afdc.energy.gov/afdc/locator/stations/.



SECTION 3: PEV OWNERSHIP AND EVSE DEPLOYMENT

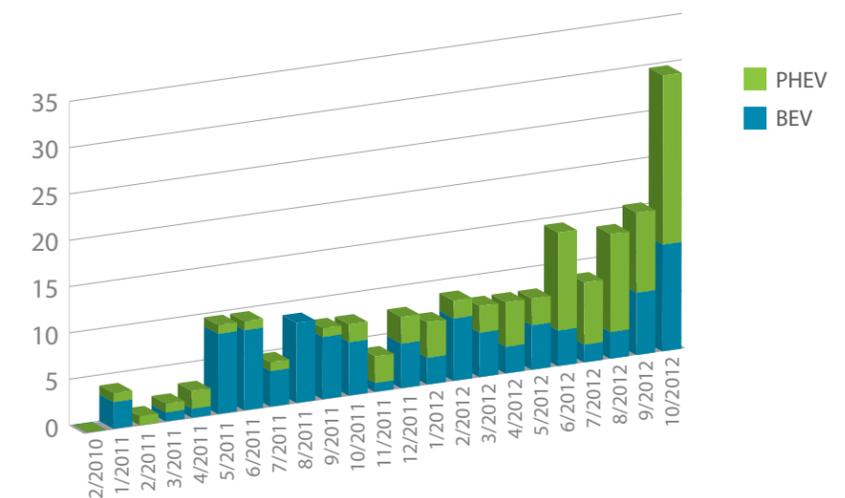
The following section highlights PEV ownership on the regional, state and national level. In addition to PEV deployment, this section provides a brief snapshot of PEV owner demographics in the San Joaquin Valley. The final component of this section provides an overview of existing and planned EVSE deployment throughout the region.

Area, Los Angeles and San Diego. As of October 2012, approximately 1% of PEVs in the state were located in the San Joaquin Valley. While PEV regional adoption is lower than other areas of the state, the trend in vehicle deployment has steadily increased since July 2012.⁶ It is interesting to note that there has been a significant jump between September and October 2012, in large in part due to an increase in PHEV sales.⁷ This trend will likely continue considering the considerable distance between cities in the San Joaquin Valley as well as the current limited amount of public charging infrastructure.

San Joaquin Valley PEV Adoption

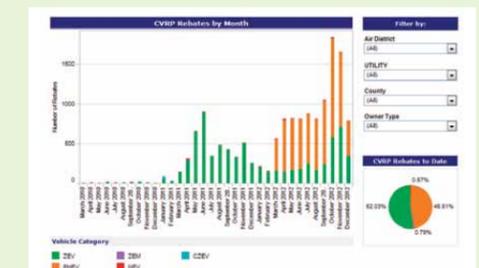
On the regional level, the San Joaquin Valley has been slower to adopt PEVs than the leading markets in the Bay

San Joaquin Valley PEV Adoption by Month



California and Regional PEV Data Resource

Updated dynamically, the online CVRP database (www.energycenter.org/cvrp) allows users to filter by utility, county and air district, as well as by vehicle and applicant type. In addition, the site offers program data for download as well as GIS maps of vehicle deployment by county.



⁶ Based on CVRP data and reports from auto manufacturers

⁷ Note that the Chevrolet Volt was not eligible for the CVRP until February 2012. To account for Volt sales, we assume that 1% of California Volt sales took place in the San Joaquin Valley region.

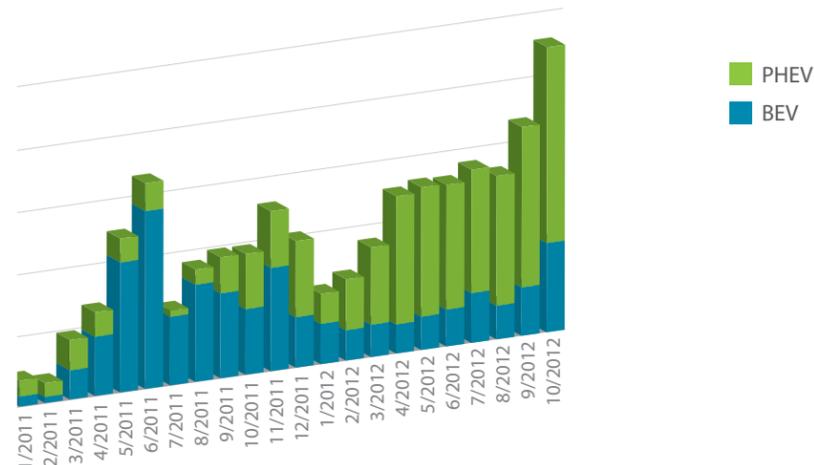
⁵ Modified from a Communication Guide developed by the PEV Collaborative, http://www.driveclean.ca.gov/images/pev/charge_times_chart_lg.jpg

California PEV Deployment

As of October 2012, approximately one-quarter of all PEVs sold in the nation were purchased by California drivers. This is likely due to significant incentives offered on both the state and regional level for vehicles as well as available infrastructure. In addition, there is approximately an equal share of PHEV and BEV owners throughout the state. However, the trend in PHEV ownership is increasing at a faster pace compared to BEVs.

California and San Joaquin Valley PEV deployment data was obtained from the Clean Vehicle Rebate Project (CVRP) applicant database. Not every PEV owner in California applies for a rebate through the CVRP; therefore, not every PEV in the state is counted in these charts. While the CVRP database does not provide the exact number of PEVs throughout California, it does provide one of the best pictures of the PEV market available and is an important resource for local government staff involved in PEV planning.

California PEV Deployment by Month

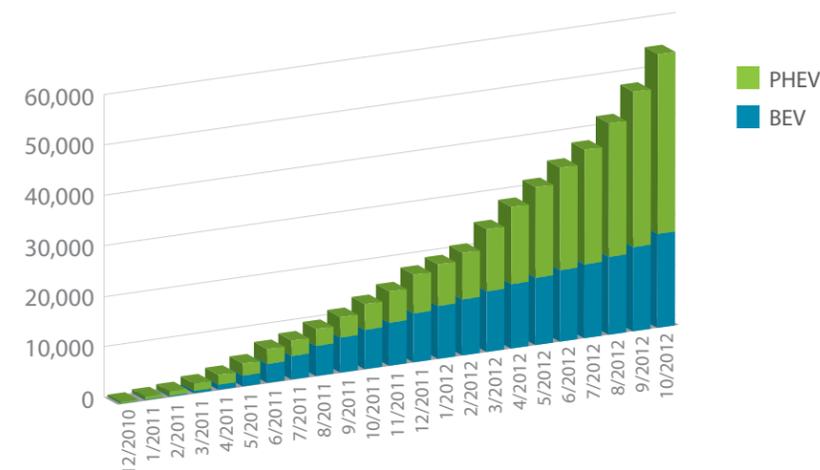


National PEV Deployment

In less than two years, PEV deployment across the nation has risen to more than 56,000 vehicles, marking a significant achievement in the PEV market. For example, when hybrid electric vehicles (HEV) hit the market, it took almost four years before HEV sales reached the number that PEVs have in less than two years.

It is important to note that HEVs and PEVs are not a direct comparison. There are no added changes to a person's daily routine when purchasing a HEV. Consumers essentially purchase a more efficient gasoline-powered vehicle. However, with the decision to drive a PEV, consumers shift their fuel from gasoline to electricity. Recognizing this more complex relationship, it is even more significant that PEVs have achieved such success in a relatively short period of time.

Cumulative National PEV Deployment



As the chart indicates, PHEV deployment across the nation has increased at a faster pace compared to BEV deployment. While there are many reasons for this trend, vehicle range, charging station cost and the lack of public infrastructure are likely important aspects. This underscores the need to expand public charging as well as streamline installation processes thereby reducing the overall costs to consumers.

Air Resources Board (ARB) and CCSE to CVRP participants throughout California.¹⁰ In partnership with ARB, CCSE has received responses from more than 2,000 California PEV owners. This survey is critical in achieving a greater understanding of who these drivers are and their charging and driving behavior.

Out of the total number of respondents, 27 are located in the San Joaquin Valley. Some of the key demographics and summary statistics of San Joaquin Valley PEV owners are included on the following pages:

San Joaquin Valley PEV Owner Demographics

PEV owner demographic data presented in this section comes directly from surveys conducted by the California

⁸ Sales figures sourced from HybridCars.com with additional input from EDTA member companies <http://www.electricdrive.org/index.php?ht=d/sp/i/20952/pid/20952>

⁹ Department of Energy Alternative Fuel Data Center, http://www.afdc.energy.gov/data/tab/all/data_set/10301

¹⁰ CCSE and ARB survey CVRP applicants in six-month intervals, after these drivers have owned their vehicle for at least six months or longer. This structure allows CCSE to track the change in PEV owner behavior over time as well as compare the behavior of one group of drivers (e.g., early adopters) to another (e.g., mid-adopters). To read a report on the results of the first cohort, visit www.energycenter.org/pevsurvey.

SAN JOAQUIN VALLEY PEV OWNER DEMOGRAPHICS

Attitude towards public charging infrastructure

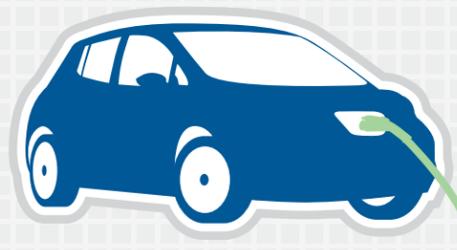
93% expressed varying levels of dissatisfaction with public charging infrastructure



80% of primary PEV drivers are male

94%

Percentage of survey respondents who are Nissan Leaf owners

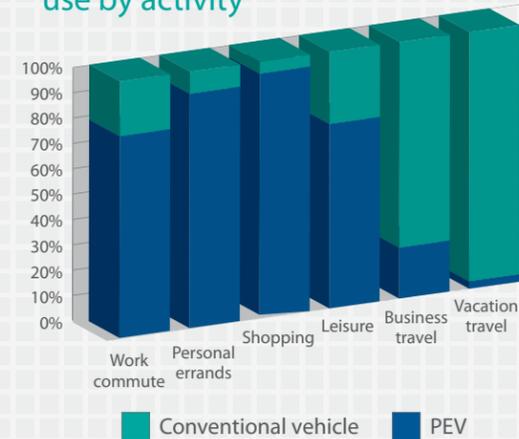


Level 2 Charger

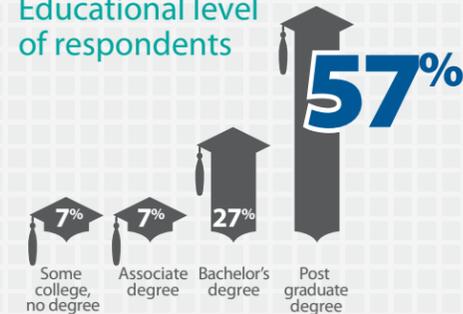


0% Percentage of survey respondents who have access to workplace charging

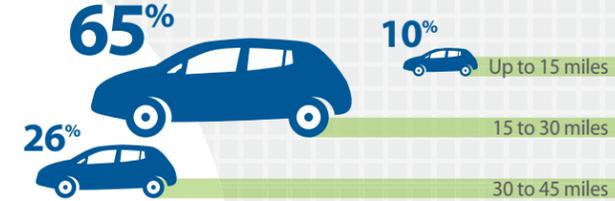
PEV vs. conventional vehicle use by activity



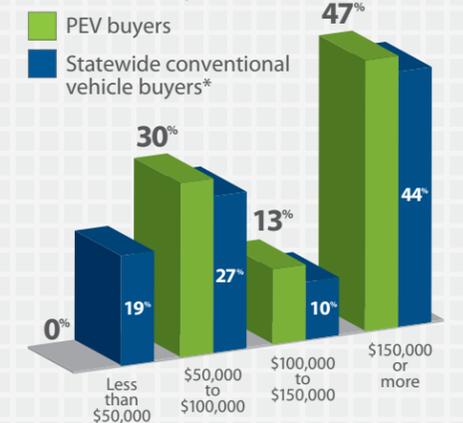
Educational level of respondents



Average miles driven per day



Household income of California new car buyers

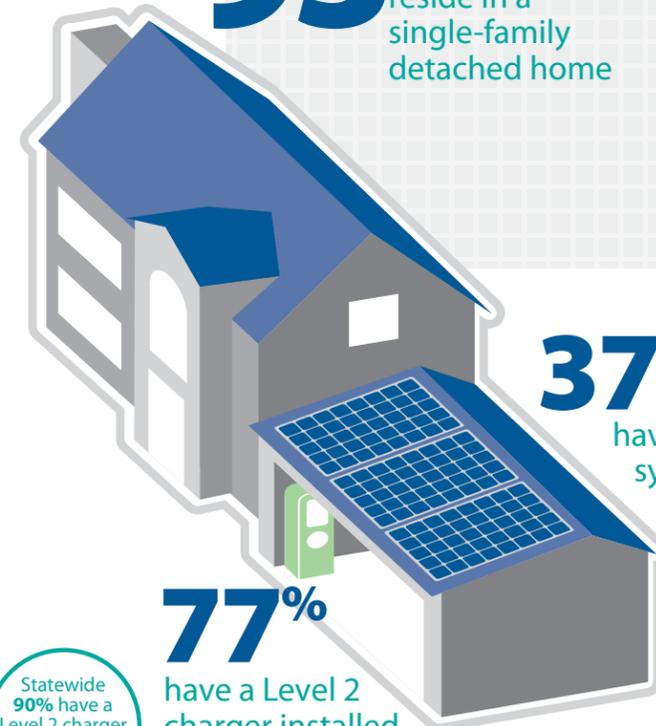


*Source: Gil Tal, UC Davis, Plug-in 2012 Conference, July 2012



3% reside in an apartment or condominium

93% reside in a single-family detached home



9% received a free or subsidized Level 2 charger

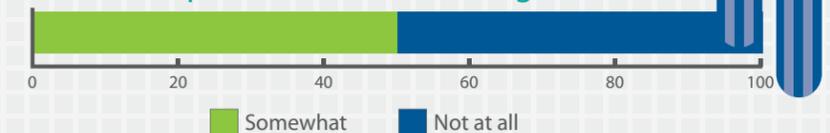
Statewide **62%** received a free or subsidized Level 2 charger

37% have photovoltaic systems installed on their home

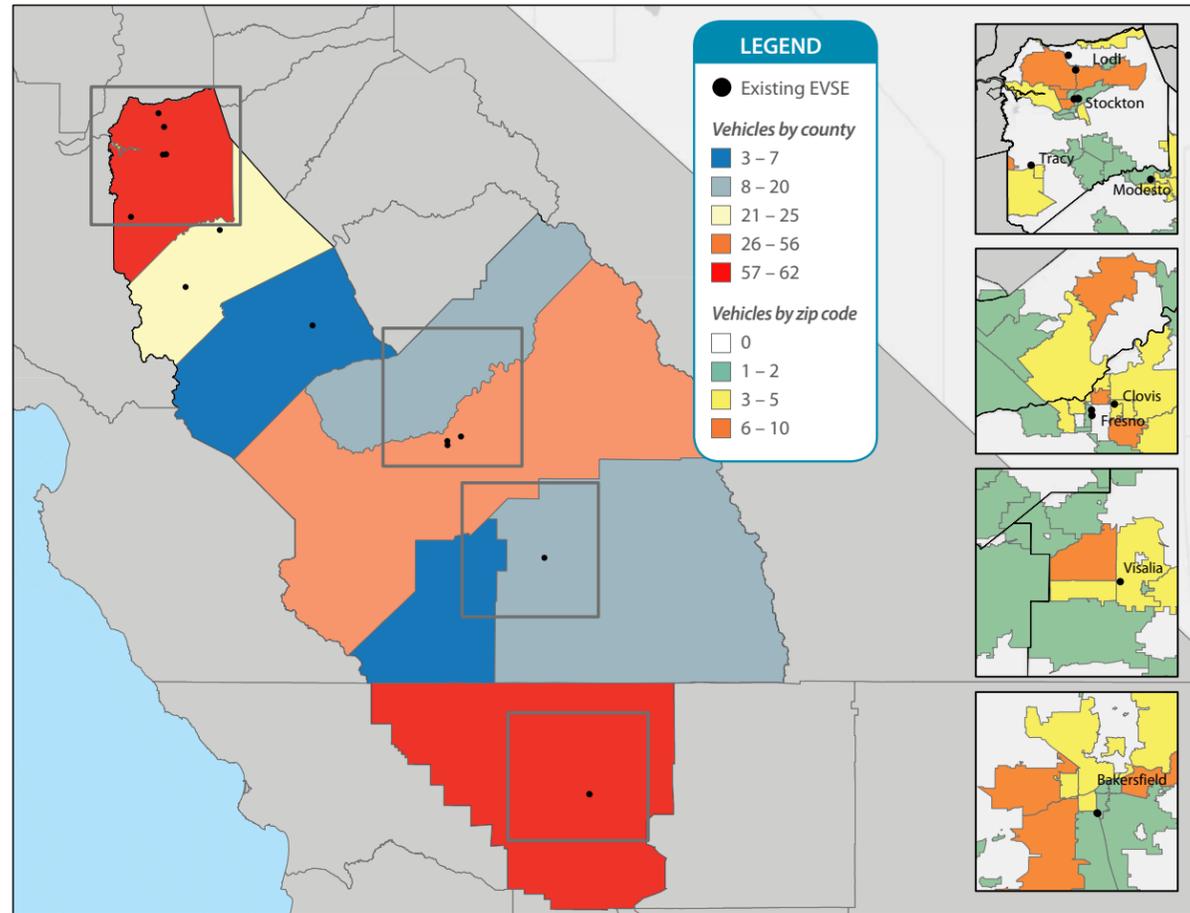
77% have a Level 2 charger installed in their home

Statewide **90%** have a Level 2 charger installed in their home

Importance of subsidy for decision to purchase a Level 2 charger



San Joaquin Valley Regional Public Charging Station Locations



increase in workplace and public charging as well as DC fast charging stations that are strategically located to provide interregional travel between cities in the San Joaquin Valley. While not the focus of this report, the second phase of this project will bring together the SJV PEVCC and additional stakeholders throughout the region to develop a more thorough regional charge port infrastructure plan. This plan will identify location quantity and investment required to install necessary infrastructure beginning in 2014, including a map of proposed infrastructure sites and a timeline for infrastructure deployment.

This map indicates the existing public charging stations available in the San Joaquin Valley region. Charging station location data was obtained from the Department of Energy’s Alternative Fuel Data Center¹¹, which is one of the most up-to-date resources available. It is clear from the map that there is limited public charging available to PEV owners throughout the San Joaquin Valley. While San Joaquin County is beginning to see a cluster of charging stations, the remaining counties in the San Joaquin Valley either completely lack or only have a couple charging stations available to the public. It is important to note that all of the stations identified in the map are Level 2 EVSE; there are no DC fast charging stations available.

In addition, the map provides the distribution of PEVs throughout the region by county and zip code, utilizing data from the CVRP. On the county level, the counties of San Joaquin, Kern and Fresno are leading PEV adoption. Taking a closer look at PEV deployment at the zip code level, we see that there are higher concentrations of PEVs around the following eight cities: Tracy, Stockton, Lodi, Modesto, Fresno, Clovis, Visalia and Bakersfield. These cities also are where we see the majority of PEV charging stations in the San Joaquin Valley.

In order for PEV adoption to increase, there will need to be a more diverse and robust network of charging stations installed in the San Joaquin Valley. This will likely include an

¹¹ Alternative Fuel Data Center www.afdc.energy.gov



SECTION 4: PEV AND EVSE INCENTIVES

The San Joaquin Valley Air Pollution Control District (SJVAPCD) offers incentives toward the purchase of PEVs and PEV infrastructure to San Joaquin Valley public agencies, businesses and residents. In many cases the incentives offered through the SJVAPCD can be combined with existing state programs to provide even more savings. A short description of each of these programs as well as the combined value of San Joaquin Valley and state incentives is included below, when available.

Plug-in Electric Vehicle Incentives:

Public Benefit Grant Program — Up to \$100,000 in Funding for Public Agencies

The Public Benefit Grant Program is specifically designed for tax-exempt institutions that are unable to take advantage of available tax credits. There is a maximum of \$20,000 per vehicle with a cap of \$100,000 per agency per year for new alternative fueled vehicle purchases (e.g., electric, hybrid, CNG, LNG, LPG). Funding is provided on a first-come, first-served basis as long as funding is available. Applications are available online, and applications must be submitted before a new vehicle is purchased.

For more information on any of the incentive programs listed here visit www.valleyair.org

Or contact the Air District directly by phone: (559) 230-5800 or by email: weberip@valleyair.org

Example of State and San Joaquin Valley Combined Incentives for a BEV (e.g., Nissan LEAF)

$$\begin{array}{r}
 \$2,500 \\
 \text{Clean Vehicle Rebate} \\
 \text{Project incentive}
 \end{array}
 +
 \begin{array}{r}
 \$20,000 \\
 \text{Public Benefit}
 \end{array}
 =
 \begin{array}{r}
 \$22,500 \\
 \text{vehicle incentive for San Joaquin Valley public agencies}
 \end{array}$$

REMOVE II — Up to \$3,000 in Funding for Local Businesses and Residents

The Drive Clean! Rebate Program provides rebates for the purchase of eligible new, clean-air vehicles for residents

and businesses of the SJVAPCD. The program is open on an ongoing basis, and funding is provided on a first-come, first-served basis as long as funding is available. Rebates under this program range from \$2,000 for a PHEV to \$3,000 for a BEV. Applications are available online.

Example of State and San Joaquin Valley Combined Incentives for a BEV (e.g., Nissan LEAF)

$$\begin{array}{r}
 \$2,500 \\
 \text{Clean Vehicle} \\
 \text{Rebate Project} \\
 \text{incentive}
 \end{array}
 +
 \begin{array}{r}
 \$3,000 \\
 \text{DriveClean!}
 \end{array}
 =
 \begin{array}{r}
 \$5,500 \\
 \text{vehicle incentive for San Joaquin Valley residents and local businesses}
 \end{array}$$

¹² To be eligible public agencies, businesses and residents must reside in the following eight counties: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and the [San Joaquin Valley Air Basin portion of Kern](#)

¹³ This includes counties, special districts (i.e., water districts, irrigation districts, etc.) and public educational institutions (i.e., school districts, community colleges, state universities, etc.)

Hybrid Voucher Incentive Program — Up to \$60,000 in Funding for Fleet Operators

The California Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) is a program created by the California Air Resources Board (ARB) to help speed the

early market introduction of clean, low-carbon hybrid and electric trucks and buses. The HVIP base vouchers range from \$8,000 to \$45,000 on a first-come, first-served basis for the purchase of each eligible new hybrid or electric truck or bus. In addition, fleets in the San Joaquin Valley that can add up to \$30,000 more per voucher.

Example of State and San Joaquin Valley Combined Incentives for an Electric Truck (e.g. Smith Electric Newton)

$$\begin{array}{r}
 \$40,000 \\
 \text{HVIP}
 \end{array}
 +
 \begin{array}{r}
 \$20,000 \\
 \text{SVJ Plus Up}
 \end{array}
 =
 \begin{array}{r}
 \$60,000 \\
 \text{for San Joaquin Valley businesses, public agencies and fleet operators}
 \end{array}$$

Electric Vehicle Infrastructure Incentives

While still under development, incentives for fueling infrastructure will be available in 2013.

Drive Clean! Rebate Program — Residential Infrastructure

This component of the existing Drive Clean! Program will provide rebates for the purchase and installation of eligible Level 2 EVSE residential charging stations. When this program becomes available, it will be open on an ongoing basis with funding provided on a first-come, first-served basis as long as funding is available. Rebate applications will be available online with an estimated rebate amount of up to \$1,000, although this may change.

Drive Clean! Rebate Program – Public Infrastructure

This component of the Drive Clean! Program is still being developed, but when available it will provide incentives for the purchase and installation of public PEV charging stations. When this component opens, it will be open on an ongoing basis with funding provided on a first-come, first-served basis as long as funding is available. Applications will be available online, and applicants will need to execute a contract with the district prior to construction. The estimated incentive amount is up to 50% of the cost of the unit and installation, although this may change.

Training for Alternative Fuel Vehicles

Alternative Fuel Vehicle Mechanic Training Component

This program provides incentives and subsidies for the education of personnel on the mechanics, operation safety and maintenance of alternative fuel vehicles, equipment structures, refueling stations and tools involved in the implementation of alternative fuel emission reducing technologies. This component is open on an ongoing basis, and funding is provided first-come, first-served as long as funding is available. Applications are available online. Agencies can receive a maximum of \$15,000 per fiscal year.

SECTION 5: ZONING AND PARKING

This section focuses on zoning and parking ordinances and policies and their relationship to the installation of residential and public PEV charging infrastructure in the San Joaquin Valley. The first part identifies potential gaps and areas for improvement in local zoning and parking policies for EVSE from the results of the San Joaquin Valley PEV readiness survey. The second part provides a summary of the actions taken to date regarding addressing signage and parking guidelines for PEVs in the San Joaquin Valley. The final part provides concise recommendations for zoning and parking polices in the region based on lessons learned since the project's inception.

Policy Gaps and Areas for Improvement: Zoning and Parking

Eighteen jurisdictions in the San Joaquin Valley region completed the zoning and parking section of the PEV readiness survey. This is only 31% of the 64 cities and

counties that were included in the survey. Despite the low participation rate, based on the results on this section, we have identified that most of the agencies in the region have not considered zoning and parking policies for EVSE. In fact, only 5% of cities responding to the survey have looked at EVSE requirements of other agencies to determine what zoning and parking requirements are best for their jurisdiction. The table below highlights the results.

Participating Jurisdictions in the San Joaquin Valley: Clovis, Coalinga, Tracy, Merced, Fresno, Tulare, Bakersfield, Kingsburg, Orange Cove, Arvin, McFarland, Madera, Modesto, Newman, Taft, Visalia, Lodi and Manteca

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

Assessing Zoning and Parking Requirements for EVSE and PEVs

Percent*	Agency Assessment
0%	Agency has already adopted requirements for EVSE that we feel would be a best practice example for the state of California
0%	Agency is in the process of adopting requirements for EVSE
5%	Agency is looking at other agencies' requirements for EVSE to determine what is best for their jurisdiction (Merced)
25%	Agency requires further information to determine requirements for EVSE (Clovis, Orange Cove, Madera, Manteca)
15%	Agency has only started to consider how to adapt requirements for EVSE (Tracy, Fresno, Arvin, Visalia)
55%	Agency has not started to look at how to adapt requirements for EVSE (Coalinga, Tulare, Bakersfield, Merced, Kingsburg, McFarland, Modesto, Newman, Taft, Lodi)

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

Lack of Staff Resources Throughout the Region

From personal phone calls conducted while administering the survey, it was clear that the lack of staff resources was a significant barrier for the majority of regional agencies. In some cases, the planning department consists of only one person. This makes any update to a city's municipal code a daunting task. The **City of Madera**, for example, acknowledged that it was in the process of updating zoning ordinances to include EVSE but needed more information to determine how to properly incorporate EVSE. Furthermore, the **City of Madera** had only one staff person responsible for updating their municipal code. Despite this, the planner indicated that a draft of the updated municipal code is on schedule to be completed by the end of 2012, with a public hearing process in spring 2013 and possibly adoption of EVSE zoning and parking policies in summer 2013. Subsequently, CCSE shared with Madera staff a set of recognized best practices that regional governments in California and Canada have adopted to promote PEV infrastructure. These best practices include building code requirements and zoning and parking ordinances for PEV infrastructure.

In support of this practice, a significant majority of jurisdictions (85%) said that it would be helpful to have other best practice zoning and parking ordinances available for reference; however, only 30% would be willing to share best practice documents with regional partners, if they felt their zoning and parking requirements were identified as a best practice example in the state.

Majority of Local Agencies Have Not Developed or Modified Existing Ordinances for EVSE

A significant majority (80%) of cities in the San Joaquin Valley have not developed or modified existing ordinances for the incorporation of EVSE into their municipal code. The lack of staff resources is one reason, but survey respondents also indicated they have not experienced the public demand to justify the use of resources to incorporate specific EVSE policies. The **City of Modesto**, for example, has not considered adopting zoning and parking policies because of the lack of public demand for PEV infrastructure in the city. The **City of Newman**, on the other hand, indicated that they are reactive to state policies and would adopt new zoning and parking EVSE requirements

if mandated by the state. Otherwise, staff will make no changes to the municipal code. The **City of Newman** is also short staffed, as it currently employs only one individual to run the planning department. As mentioned previously, the distribution of zoning and parking best practices is critical to spur EVSE deployment in the region.

Again, while none of the jurisdictions responding to the survey have developed unique zoning and parking ordinances for EVSE installations, jurisdictions such as the **City of Tracy** reported that if their planning agency was in the process of adopting revised zoning and parking ordinances for EVSE, staff anticipated it would take up to six months for adopting new ordinances. In addition, the cities of **Merced, Modesto, McFarland** and **Manteca** would likely take six to eight months to amend their zoning ordinance. Times for other cities, such as **Newman, Taft** and **Lodi**, are slightly shorter with ordinance adoption taking anywhere from a few months to four to six months. On the other hand, the cities of **Coalinga** and **Tulare** expect a year for any revised ordinances that include EVSE zoning and parking regulations to be included. It should be noted that the **City of Coalinga** reported that it had used consultants to develop general zoning and parking ordinances for EVSE.

Addressing Policy Gaps and Areas for Improvement

While addressing EVSE zoning and parking policies in the San Joaquin Valley is a significant issue, there has been only one jurisdiction working on developing internal policies. The following section describes the **City of Tracy's** work to address parking guidelines at PEV charging stations. Additionally, this section describes the regional adoption of CALGreen Building Codes and the statewide effort to create more consistent PEV signage.

Local Sustainability Action Plan: The City of Tracy

The City of Tracy Sustainability Action Plan, published in February 2011, includes an analysis of sustainability targets, specific measures and a summary of expected benefits.¹⁴ In the transportation and land use sustainability measures, the plan calls for the "increased use of low-carbon fueled

vehicles" to support low-carbon fueled vehicles policies, which inherently stimulate the adoption of PEVs and PEV infrastructure.

Transportation and Land Use Measure: Increased Use of Low-Carbon Fueled Vehicles¹⁵

Conduct the following to promote the use of low-carbon fueled vehicles:

- Amend the zoning ordinance or city standards to require new projects to provide parking spaces reserved for hybrid or **electric vehicles (EVs)**, carpool or car share vehicles.
- Require dedicated parking spots for alternative fuel, hybrid, carpool, or car share vehicles in city parking lots **and consider installing charging connections.**
- Encourage the use of hybrid and **electric construction equipment** and the use of alternative fuels for construction equipment.

Parking Guidelines

Some jurisdictions are in the process of adopting CALGreen Building Code requirements that designate 10% of parking be set aside for all alternative fuel and low-emission vehicles in public spaces. However, none of the jurisdictions in the San Joaquin Valley has adopted the voluntary measures for EVSE included in CALGreen that specifically recommend prewiring for EVSE in residential and nonresidential new buildings. The 2010 California Green Building Standards Code (CALGreen) became effective on January 1, 2011.

The **City of Merced**, for instance, has adopted the 10% parking set aside, but has yet to complete any public EVSE installations. On the other hand, the city has recently purchased 22 hybrid vehicles and has multiple city-owned compressed natural gas (CNG) trucks for garbage collection. This highlights that regional communities are taking measures to become more sustainable in the transportation sector, however, more education on the benefits of fleet conversion to PEVs (e.g., financial incentives and economics) and the installation of EVSE are needed. The city has identified that the low volume

of PEV vehicle purchases in the region does not justify the use of public funds for PEV infrastructure. Further, the city indicated that the implementation of specific EVSE zoning and parking policies into the city's municipal code is unlikely with limited staff resources.

EVSE Signage

While not a regional effort, it is important to recognize work on the state level to develop more consistent signage for PEVs. The California Department of Transportation, Sonoma County Department of General Services and the California PEV Collaborative have developed a proposal to add five signs, one plaque and an optional pavement marking to the 2012 edition of the *California Manual on Uniform Traffic Control Devices* (CA MUTCD). This effort is tied directly to Governor Brown's Zero Emission Vehicle Executive Order, which has a goal of reaching 1.5 million PEVs and fuel cell vehicles by 2025.

These signs are categorized into regulatory and general service signs. Examples of the new signs are included.

Regulatory Signs

- ▶ **PEV Tow-Away Symbol:** This sign indicates that vehicles will be towed if not utilizing the available charging station (per CVC 21511). This sign will include the tow-away symbol with the following language "UNAUTHORIZED VEHICLES NOT CONNECTED FOR ELECTRIC CHARGING PURPOSES WILL BE TOWED AWAY AT THE OWNER'S EXPENSE . . ." with red text on a white background and be 24" x 24".



¹⁵ The EV parking recommendation also calls for other sustainable transportation measures such as encouraging employers to create vanpool or shuttle programs for employees and converting the municipal automotive fleet to cleaner fuels and lower emissions. All low-emission vehicle recommendations are located in T-17: Increased Use of Low Carbon Fueled Vehicles, pp. 5-13.

¹⁴ The City of Tracy Sustainability Plan, 2011, www.ci.tracy.ca.us/documents/Sustainability_Action_Plan.pdf

▶ **No Parking Symbol:** This sign indicates no parking unless for charging a PEV. This will include the following language “EXCEPT FOR ELECTRIC VEHICLE CHARGING” with red text on a white background and be 12” x 18”.



▶ **Permissive Charging Symbol:** This sign indicates the time that charging will be available and will include the following language “[Electric Vehicle] __ HOUR CHARGING - __ AM TO __ PM” with green text on a white background and be 12” x 18”.



General Directional Signs

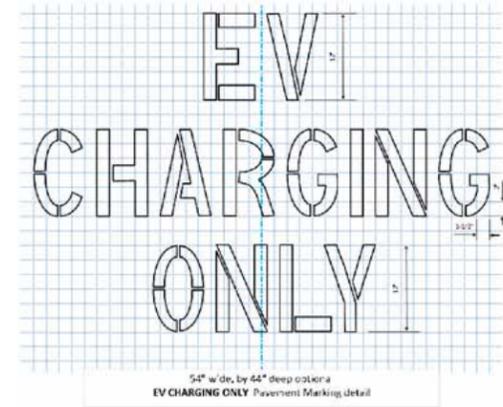
▶ **Electric Vehicle Charging Station Symbol and Word Message Signs:** These signs will assist in directing PEV drivers to charging stations from the freeway, local streets and at charging locations. The sign includes the EV charging station symbol (shown) or the following text “ELECTRIC VEHICLE CHARGING STATION” with white text on blue background. Sign sizes should be 30” x 30” for freeway or major arterial highway application, 24” x 24” for local streets, and 18” x 18” off-street parking application.



▶ **FAST Electric Vehicle Charging Station:** This plaque indicates the charging station is capable of a charge in less than one hour (faster charge compared to a Level 2 station). The sign will include the language “FAST” in white text on a blue background and be 24” x 6” or 30” x 8”. This plaque is for use only with the Electric Vehicle Charging station symbol and word message.



▶ **Optional EV charging Pavement Marking:** This pavement marking will indicate a parking space is for EV charging only for on- and off-street electric vehicle charging station stalls. The pavement marking will include the following language “EV CHARGING ONLY” in white text.



Recommendations for Regional Next Steps

Based on the feedback from the PEV readiness survey, we have identified that zoning and parking policies for EVSE are practically nonexistent in the San Joaquin Valley. Jurisdictions across the region have expressed interest in receiving information on how other agencies have developed these policies. While a few agencies have begun to address some of these issues, there are additional areas where clear guidance is needed.

Through the lessons learned in the San Joaquin Valley and a review of national and state best practices, we have identified four recommendations. The first three are focused on consistent signage, designated parking for PEVs and parking accessibility guidelines. The fourth recommendation is more of a strategy that utilizes the San Joaquin Valley Plug-in Electric Vehicle Coordinating Council to review and prioritize national and state best practices and identify how these will be implemented in the region. Note that a complete list of best practices reviewed in preparation of this plan is included in the zoning and parking section of the Appendix.

Consistent General Service and Regulatory Signage

Recommendation: Collectively adopt across the San Joaquin Valley region the general service and regulatory PEV signage recommended by the California Department of Transportation, the California Plug-in Electric Vehicle Collaborative and the County of Sonoma amendments to the 2012 edition of the California Manual on Uniform Traffic Control Devices.

Benefits: Standardizing signs for PEV parking across the San Joaquin Valley will decrease costs, create uniformity. This signage was based on signage currently endorsed by the state and the U.S. Department of Transportation Federal Highway Administration (FHWA). Aligning regional signage policy with state and federal efforts allows for more consistent signage and less confusion for PEV drivers.

Update Municipal Zoning Language for Dedicated PEV Parking

Recommendation: Incorporate PEV parking requirements in public, private and government facilities based on market growth of PEVs in the region. Further, municipalities should leverage the “Hawaii State Plug-in Electric Vehicle Parking Requirement” and update their zoning ordinances to reflect the following language.

Updated Zoning Language to be Adopted:

All public, private and government parking facilities that are available for use by the general public and that include at least 100 parking spaces must designate at least the number of parking spaces outlined in the following table specifically for the use of PEVs. The spaces designated for PEVs will continue to increase by 1% for each additional 5,000 registered PEVs until the percentage reaches 10%.

Total Number of Parking Spaces	Number of Required PEV Spaces
1 – 50	1
51 – 200	2
201 and over	4

Benefits: Provides certainty in the marketplace that there will be dedicated parking spaces for PEVs. The addition of the market threshold provision ensures that enforcement policies are enacted when there is sufficient demand for this infrastructure.

EVSE Parking Accessibility

Recommendation: Utilize the *City of San Diego Technical Policy 11B-1* as policy for installing charging equipment serving accessible EVSE.

Benefits: Provides a simple template for adopting accessible zoning and parking guidelines for PEVs and EVSE. This makes available three options that will ultimately lower the cost of installation for installers and EVSE hosts. This policy also leverages guidelines developed by the

Division of the State Architect and 2010 California Building Code (CBC) that requires accommodations and services to be made accessible to persons with disabilities.

As mentioned previously, a complete description of *City of San Diego Technical Policy 11B-1* specifications for disabled accessible EV charging stations and requirements can be found in the Appendix.

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

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

Benefits: Working with SJV PEVCC members will help to ensure regional support for zoning and parking best practices and thereby greater likelihood of implementation. In addition, leveraging the members of SJV PEVCC’s extensive network of regional contacts allows for a more efficient way to direct best practices and other resources to municipalities with the greatest needs.

SECTION 6: PERMITTING AND INSPECTION

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

Policy Gaps and Areas for Improvement: Permitting and Inspection

Fourteen jurisdictions in the San Joaquin Valley region completed the permitting and inspection section of the

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

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

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

Assessing Permitting and Inspection of EVSE in the San Joaquin Valley

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

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

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

Majority of Regional EVSE Installations Require a Building and Electrical Permit

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

60% of jurisdictions require a building and electrical permit for commercial and multifamily installations.¹⁷

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

Permit Costs Vary by Type of EVSE Installation

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

Costs of Permits by Type of EVSE Installation*

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

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

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

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

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

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

Lengthy Permitting Delays for EVSE Installations

Of all the agencies surveyed, very few in the region offered permitting services in less than five business days. In fact, the majority of agencies (53%) took between six to 10 business days to issue a permit for an EVSE installation in a single-family home, which compared to nonresidential installations, is usually far less complex. Therefore, it is not surprising to see that 27% of regional agencies were unsure of the time length for permits issued for on-street installations of EVSE due to the lack of public PEV infrastructure in the region. The **City of Modesto**, for

instance, stated that it does not allow on-street parking EVSE installations, and as a result, no permit issuance policy exists for this type of installation.

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

Lack of Jurisdictional Knowledge of EVSE Installation Checklist Best Practices

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

Time to Issue Permits by Type of EVSE Installation*

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

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

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

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

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

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

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

Permitting Inspection Requirements

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

Inspections Required for EVSE Installations*

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

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

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

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

Addressing Policy Gaps and Areas for Improvement

Overall, municipalities throughout the San Joaquin Valley have a limited knowledge and involvement in developing permitting processes for EVSE. However, some cities have begun to address permitting for EVSE. The City of Turlock is one of the municipalities that have started working to

streamline the permitting and inspection process by creating an EVSE installation checklist for regional EVSE installers.

Streamlining EVSE Permitting Process with EVSE Installation and Permitting Requirements

City of Turlock

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

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

Recommendations for Regional Next Steps

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

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

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

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

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

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

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

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

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

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

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

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

Develop EVSE Permit Municipality-Utility Communication Channel

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

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

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

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

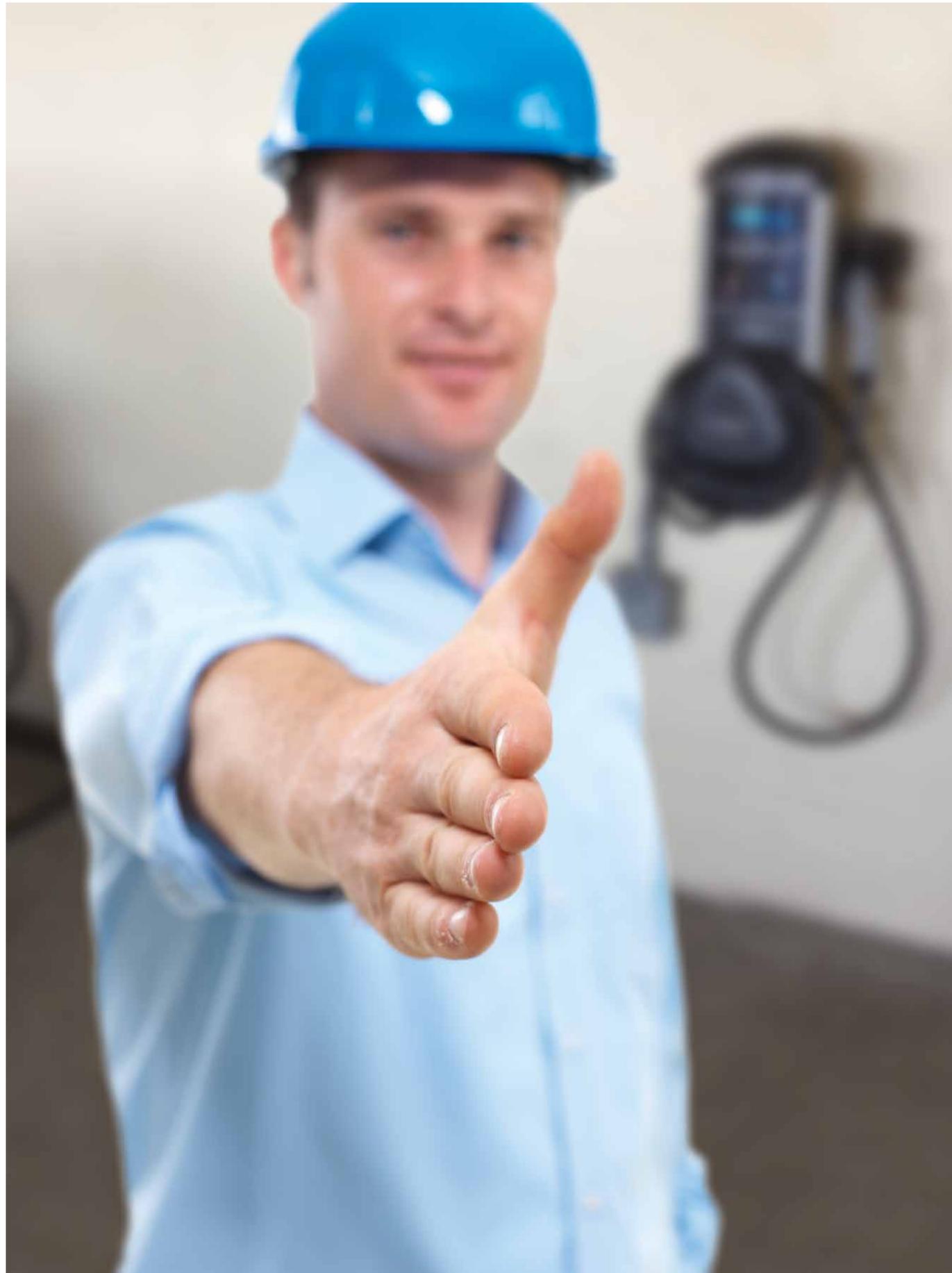
Recommendation: Leverage SJV PEVCC members and the list of existing best practices collected by CCSE to identify and prioritize additional EVSE permitting and inspection best practices that will assist in promoting PEVs through policies and processes that are relevant to the San Joaquin Valley. Once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

Benefits: Working with SJV PEVCC members will help to ensure regional support for permitting and inspection best practices and thereby create a greater likelihood of implementation. In addition, leveraging the members of SJV PEVCC’s extensive network of regional contacts

provides a more efficient way to channel best practices and other resources to municipalities with the greatest needs.

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

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



SECTION 7: BUILDING CODES

This section focuses on building code requirements for the installation of residential and nonresidential electric vehicle charging stations (EVSE) in the San Joaquin Valley. The first part leverages results of the building code section of the San Joaquin Valley regional PEV readiness survey to identify policy gaps and areas of improvement. This part also highlights the variations in the length of time for building codes to be adopted into local municipal codes throughout the region. The next part provides a summary of the actions taken to date to address barriers to PEV deployment with respect to building codes in the San Joaquin Valley. The final part provides suggested recommendations regarding PEV-friendly building code policies for jurisdictions throughout the San Joaquin Valley.

Policy Gaps and Areas of Improvement: Building Codes

Jurisdictional representation in the building code section of the PEV readiness survey was much lower than

compared to the previous sections. Thirteen jurisdictions in the San Joaquin Valley region completed the building code survey. This is only 20% of the 64 cities and counties that were included in the survey. Despite the low participation rate, based on the results in this section, none of the jurisdictions responding has adopted building code requirements for EVSE installations, nor does any jurisdiction have unique EVSE building code requirements for new construction and existing buildings. Furthermore, over 63% of the jurisdictions responded that their agency requires further information to create building code requirements for EVSE. The following table highlights the results.

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

Note: The **City of Visalia** had three and the **City of Tulare** had two individuals provide separate responses for their

Assessing Building Code Requirements for EVSE

Percent*	Agency Assessment
0%	Agency has already adopted requirements for EVSE that we feel would be a best practice example for the state of California
13%	Agency is in the process of adopting requirements for EVSE (Tracy, Sanger)
13%	Agency is looking at other agencies' requirements for EVSE to determine what is best for their jurisdiction (Tulare, County of San Joaquin)
19%	Agency requires further information to determine requirements for EVSE (Visalia, Fresno, Lodi)
19%	Agency has only started to consider how to adapt requirements for EVSE (Visalia, Turlock)
38%	Agency has not started to look at how to adapt requirements for EVSE (Tulare, Kingsburg, Orange Cove, McFarland, Newman, Modesto)

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

jurisdiction, all were credited. This information is based on surveys conducted in 2012, some cities may have begun working on PEV readiness since the survey was implemented but this will not be reflected in the section below.

All jurisdictions stated that it would be helpful to have other city or agency building code best practices available for reference. This highlights the need for best practices to be distributed throughout the region. **San Joaquin County** indicated that they are in the process of developing their requirements using internal staff and have consulted with other agencies. Furthermore, the **City of Turlock** reported that they have looked at the City of San Jose's EVSE requirements for guidance for creating their own codes for EVSE.²¹

Regional Variation in Timeline and Administrative Processes for Adopting New Building Code Requirements

The formal decision-making process for adopting EVSE-friendly building codes into local municipal codes and associated timelines needs to be clearly understood for each jurisdiction. This is evident in the survey results where the majority of agencies were unsure of the timetable for the adoption of new building code requirements. However, five of the jurisdictions polled provided more detail on the timelines and processes necessary for updating these codes. The following paragraph provides a brief summary of their responses.

The **City of McFarland** stated that any new building codes would take six months from conception to adoption. First, the staff needs to create a report on the specific code language and include research materials that address specific issues. In this case, CCSE can support this effort by providing PEV and EVSE educational materials to city staff. From there, the staff report is sent to the city attorney for review, and then it is sent to the planning commission for a final vote. On the other hand, the **City of Orange Cove** indicated that no required building codes for EVSE would be adopted any time soon, unless EVSE specific codes are required by the state. Cities such as **Newman** and **Turlock** specified any adoption to take two to three months. Meanwhile, the **City of Modesto** stated that for any formal

change in the municipal code, including EVSE building code requirements, would take up to a year. However, staff from Modesto also stated that city policy changes that include EVSE code requirements would be implemented immediately.

Addressing Policy Gaps and Areas for Improvement

The following section describes the regional adoption of California Green Building Codes (CALGreen) that require designated parking for low-emission vehicles. In addition, the section discusses the EVSE supply and prewiring requirements that are required for single-family residences in a housing subdivision located in the **City of Tracy**.

Adoption of CALGreen Building Codes

California has existing building code provisions that regulate all construction projects throughout the state. Within these provisions the state has also established CalGreen, a more stringent building code that requires new buildings and renovations in California meet certain sustainability and energy efficient standards through mandatory and voluntary measures.²² A few of the jurisdictions surveyed have adopted only the basic voluntary CALGreen building codes requirements that designate 10% parking be set aside for all alternative fuel and low-emission vehicles in public spaces. These include the cities of **Orange Cove**, **Modesto**, and **Turlock**.

In addition, CALGreen includes advanced voluntary provisions to encourage local communities to take further action to green their buildings and thereby reduce greenhouse gas emissions. These voluntary provisions include "prewiring" building codes specific for EVSE. None of the jurisdictions in the San Joaquin Valley have adopted these specific EVSE codes. The **City of Visalia** and the **City of Fresno**, however, reported that they have adopted the 2010 National Electrical Code Article 625, which covers safety requirements for PEV charging stations.²³

City of Tracy Mountain House Plan Includes EVSE 240V Requirement in New Homes

The Mountain House community is located five miles from the City of Tracy and is an exurb of the San Francisco Bay Area. Located next to major transportation corridors, and 20 minutes from the Easy Bay, the Mountain House Community Services District (MHCSD) uses "a variety of innovative technologies to provide environmentally friendly services and amenities," as quoted on their website.

The Mountain House Master Plan includes a chapter on air quality compliance and transportation-demand management policies and implementation measures that are to be incorporated into the community's building systems, construction practices and transportation management programs. A copy of the chapter is located in the building codes section of the Appendix.

This chapter (10.6 HOUSES AND BUILDINGS) includes the objective to reduce air emissions from Mountain House residences, with the following EVSE building code required as a condition of tentative map approval:

240-volt electrical outlets for recharging electric automobiles shall be provided in each garage. Electrical outlets shall be located on the outside of single-family homes to accommodate electric lawn maintenance equipment and electric barbecues.

The 240-volt electrical outlet will provide sufficient "prewiring" capacity to support a Level 2 residential EVSE in a garage. Furthermore, the requirement to have electrical outlets located on the outside of single-family homes will provide appropriate infrastructure for charging PEVs using 120-volt outlets.

Recommendations for Regional Next Steps

Based on feedback from the PEV readiness survey, we have identified that jurisdictions in the region do not have specific building codes for EVSE. However, jurisdictions across the region are interested in receiving information on how other agencies have developed building codes. In addition, there is uncertainty regarding the process each jurisdiction has to update building codes.

Through the lessons learned in the San Joaquin Valley and a review of national and state best practices, we have

identified the following four recommendations for the San Joaquin Valley. These recommendations focus on understanding building code processes and potential barriers as well as prewiring for new construction. The final recommendation establishes a strategy that utilizes the San Joaquin Valley Plug-in Electric Vehicle Coordinating Council (SJV PEVCC) to review and prioritize national and state best practices and identify how these will be implemented in the region. Furthermore, the recommendations in this section are organized into actions jurisdictions should take in the near to long term. A complete list of best practices reviewed in preparation for this document is in the building code section of the Appendix.

We recognize that many of the cities in the San Joaquin Valley do not have the resources to update building codes. As a result, we have provided specific language that can be directly inserted into existing municipal codes to assist local governments and streamline this process. In addition, CCSE is working with several stakeholders on the state level to establish similar EVSE policies throughout California, which will provide further guidance for local governments.

Understanding Building Code Timelines and Processes

Recommendation: Leverage SJV PEVCC members and additional local government stakeholders to prepare a building code review to gain a better understanding of potential barriers to PEV deployment. As part of this review, develop a clear outline of the processes, decision-makers and timelines associated with updating building codes in each of the 64 jurisdictions across the San Joaquin Valley.

Benefits: Having a better understanding of building code processes and potential barriers will help in developing proposed solutions. This review will assist in making difficult decisions, such as whether it is a better strategy to modify existing building codes or adopt new building codes in each jurisdiction.

Modify Existing Use/Discretionary Permitting Processes to Include EVSE

Recommendation: As a near-term goal, incorporate standardized project condition language that defines where or how to incorporate EVSE in project design and planning processes. Installation of EVSE should be identified as a greenhouse gas mitigation strategy per the

²¹ In the *City of San Jose's Green Vision 2011 Annual Report*, it states that the in the Envision San Jose 2040 General Plan was achieved with the council adoption of an ordinance to revise the zoning code to align better with the Envision General Plan, with key changes including allowing higher density development in a multifamily residential district, installation of electric vehicle charging stations and other sustainability measures. http://www3.sanjoseca.gov/clerk/Agenda/20120320/20120320_0303att.pdf

²² <http://www.califiving.com/title24-energy/index.php/green-building-programs/9-what-is-calgreen->

²³ Underwriters Laboratory summary of EVSE Safety Requirements <http://www.ul.com/global/documents/corporate/aboutul/publications/newsletters/electricalconnections/November10.pdf>

California Environmental Quality Act (CEQA). Leverage existing major use and discretionary permitting processes in the region to accomplish this by utilizing the following recommended language:

For NONRESIDENTIAL AND RESIDENTIAL PROJECTS, *include a space dedicated in the electrical panel for a circuit for plug-in electric vehicle charging; and a label stating "PEV CAPABLE" shall be posted in a conspicuous place at the service panel or subpanel and next to the raceway termination point.*²⁴

For NONRESIDENTIAL PROJECTS, *ensure each parking space required in the table below, provide panel capacity and dedicated conduit for one 208/240 V 40 amp circuit terminating within 5 feet of the midline of each parking space.*²⁵

Total Number of Parking Spaces	Number of Required PEV Spaces
1 – 50	1
51 – 200	2
201 and over	4

For RESIDENTIAL PROJECTS (e.g. planned subdivisions), *provide a minimum number of 208/240 V 40 amp, grounded AC outlet(s), in both single-family and multifamily unit dwellings. The outlet(s) shall be located in the parking area and have a minimum of the following:*

- **Single-Family Dwellings:** 1 per unit
- **Multifamily Unit Dwellings:** 5% of parking capacity

Benefits: Incorporating this language into the conditions associated with the use/discretionary permitting processes allows municipalities to promote EVSE through existing methods. In addition, this language provides another option for developers to meet the additional requirements such as those under the CEQA. Further, prewiring during the construction of a building significantly reduces the cost associated with EVSE installation.

²⁴ Language adapted from County of San Diego and CALGreen Voluntary Building Code A4.106.6.1.1

²⁵ Language adapted from CALGreen Voluntary Building Code A5.106.5.3.1

²⁶ Language adapted from County of San Diego and CALGreen Voluntary Building Code A4.106.6.1.1

²⁷ Language adapted from CALGreen Voluntary Building Code A5.106.5.3.1

Adopt/Update Prewiring for EVSE in Residential and Nonresidential New Construction

Recommendation: As a long-term goal, update current building codes in each jurisdiction across the San Joaquin Valley with the following language modified from the current voluntary CALGreen building code language (A5.106.5.3.1) as mandatory in ALL new nonresidential and residential construction.

Note: This is the same language as the previous recommendation but would update the building code and apply to all new construction; thus is a longer-term goal for the region.

For NONRESIDENTIAL AND RESIDENTIAL PROJECTS, *include a space dedicated in the electrical panel for a circuit for plug-in electric vehicle charging; and a label stating "PEV CAPABLE" shall be posted in a conspicuous place at the service panel or subpanel and next to the raceway termination point.*²⁶

For NONRESIDENTIAL PROJECTS, *ensure each parking space required in the table below, provide panel capacity and dedicated conduit for one 208/240 V 40 amp circuit terminating within 5 feet of the midline of each parking space.*²⁷

Total Number of Parking Spaces	Number of Required PEV Spaces
1 – 50	1
51 – 200	2
201 and over	4

For RESIDENTIAL PROJECTS (e.g. planned subdivisions), *provide a minimum number of 208/240V 40 amp, grounded AC outlet(s), in both single-family and multifamily unit dwellings. The outlet(s) shall be located in the parking area and have a minimum of the following:*

- **Single-Family Dwellings:** 1 per unit
- **Multifamily Unit Dwellings:** 5% of parking capacity

Benefits: Uses an existing policy mechanism already endorsed by the State of California and the City of Los Angeles. Prewiring during the construction of a building significantly reduces the cost associated with the installation of EVSE.

Utilize the SJV PEV Coordinating Council (PEVCC) to Identify, Prioritize and Implement Building Code Best Practices to Regional Stakeholders.

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

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



SECTION 8: TRAINING AND EDUCATION

This section focuses on training and education programs and efforts related to the installation of residential and nonresidential EVSE in the San Joaquin Valley. The first part recognizes the barriers and potential policy gaps toward providing training and education opportunities for PEV stakeholders in the San Joaquin Valley. The next part provides a summary of the actions taken to date regarding PEV workshops and training opportunities in the San Joaquin Valley. The final part offers concise recommendations to increase training and education opportunities for PEV stakeholders in the San Joaquin Valley.

Policy Gaps and Areas for Improvement: Training and Education

This section of the survey had minimal participation, with only five jurisdictions responding: **Tulare, McFarland, Madera, Newman** and **Taft**. Of these respondents, just two indicated that city staff had participated in PEV-related trainings. Only the **City of Newman** reported their planning staff have participated in educational workshops on how to incorporate PEVs into their city fleet. In addition, the **City of Tulare** indicated that outreach workshops for first responders focused on PEV technology have been held in its region. The remaining cities indicated they were not aware of PEV and EVSE workshops for municipal staff being offered in the region.

It is important to note that each of the jurisdictions surveyed indicated a demand for greater training and education programs in the region. Furthermore, none of the agencies stated that they have developed policy tools to become more PEV ready; however, all agencies were interested in receiving education materials if they are available.

Lack of Regional Training for EVSE Installers

In late 2012, CCSE contacted regional training directors from various county Joint Apprenticeship and Training Committee (JATC) offices to learn if they have implemented the Electric Vehicle Infrastructure Training Program

(EVITP) in their region. EVITP was developed through a collaboration of stakeholders from both industry and government sectors. This training teaches industry best practices in PEV infrastructure installation, commissioning and maintenance.

Kern County Electrical JATC, which is located in the **City of Bakersfield**, does not include an EVITP program at its facility. However, according to the regional training director, PEV infrastructure and the EVITP will be discussed during committee meetings before the end of 2012. The committee consists of members of the International Brotherhood of Electrical Workers (IBEW) and the National Electrical Contractors Association (NECA). Funding for the EVITP depends on committee approval.

The **San Joaquin** and **Calaveras Counties Electrical JATC** is located in the **City of Stockton**, and their training facility does not include an EVITP program. Further, the facility does not have an EVITP-certified trainer and told CCSE that they did not have the resources to fund such a program. That said, the Stockton training is in close proximity to three other NECA facilities in Northern California (Alameda County JATC, Modesto/San Joaquin Valley JATC,²⁸ Sacramento County JATC). As a result, interested EVSE installers are directed to these facilities. Unfortunately, after speaking with the training director at the Alameda County JATC (which offers EVITP at their facility), not many contractors from outside of Alameda County participate in the program. Based on this, we assume that contractors concentrated in the northern section of the San Joaquin Valley do not have adequate training for EVSE installations and procedures.

Addressing Policy Gaps and Areas of Improvement

This section will provide a brief summary of PEV workshops and training events that have been offered in the area. In addition, this section will provide a brief overview of future statewide efforts to address emergency and first responder PEV training. Note that education for PEV consumers and regional businesses are covered in the next section:

²¹ Unfortunately the Modesto/San Joaquin Valley JATC was not available for comment.

Outreach to Local Residents and Businesses. See the Appendix for a complete list of both past and future PEV and EVSE training and education programs offered in the San Joaquin Valley.

Training for Municipalities

PEV Readiness Workshop for Municipal Staff Held in Fresno, Bakersfield and Modesto

On May 15, 2012, the SJVAPCD partnered with the PEV Collaborative to host a PEV Community Readiness Workshop for city and local government staff. The workshop was held at the SJVAPCD office in **Fresno** and was made available via videoconference to municipalities near the district's satellite offices in **Bakersfield** and **Modesto**. Experts from municipalities in the San Joaquin Valley, as well as on the state level, shared best practices regarding policies to promote PEV infrastructure. Specifically, the workshop focused on EVSE zoning and parking policies, the need for updated building codes to accommodate EVSE, permitting and inspection processes, available PEV/EVSE training and education programs and methods to improve outreach to local residents and businesses.

All workshop participants received a draft version of the PEV Readiness Toolkit. The toolkit, developed by the PEV Collaborative and regions across the state, is a comprehensive document of EVSE installation guidelines, best practices and policy recommendations — resources that are needed to respond to evolving issues around building codes, permitting and procedures to support the growing PEV market. All post-workshop surveys indicated that participants increased their knowledge and understanding of PEVs and were better equipped to discuss PEV readiness with others. Further, all participants stated that they felt more prepared to engage with the policy processes concerning PEV readiness as a result of attending the workshop.

Regrettably, 82% of participants taking the survey indicated their community would not be PEV ready by the end of 2012. Respondents highlighted that municipalities in the San Joaquin Valley are already understaffed and would have a difficult time seeing past financial hurdles to seek grants and funding for PEV infrastructure. Moreover, the lack of public interest in PEVs and sustainability programs overall were cited as primary reasons they will not be ready by the end of 2012.

PEV Readiness Toolkit for Municipalities



Since the survey was initially distributed, the PEV Collaborative, working with CCSE and five additional regions across the state, has developed a PEV Readiness Toolkit.

The toolkit provides a quick reference guide to developing policies promoting PEVs in each of the five core areas addressed in this document (e.g., zoning and parking). This toolkit has been distributed to municipalities in the San Joaquin Valley and published on CCSE's Plug-in & Get Ready website (www.energycenter.org/pluginready).

Training for Emergency First Responders

Statewide Assessment and Training for Emergency First Responders

In November 2012, the Department of Energy awarded funding to Clean Cities organizations throughout California to perform an assessment and subsequent training for emergency first responders. The first phase of the project includes an assessment of the regional needs related to training for emergency first responders on alternative fuels, including PEVs. The assessment will prioritize what trainings are needed throughout the state and identify what trainings should be conducted on a region-by-region basis. Advanced Transportation Technology and Energy (ATTE) Centers in San Francisco, Long Beach and San Diego will either conduct the trainings or coordinate with community colleges. It is anticipated the assessment will be conducted by the end of summer 2013 with trainings implemented in fall 2013.

Recommendations for Regional Next Steps

Based on the results of the survey and feedback from the PEV readiness workshop on May 15, 2012, there is

demand for municipal training regarding PEV infrastructure planning. In addition, our research and outreach with stakeholders throughout the region indicates a limited amount of PEV training programs available for EVSE installers and emergency first responders. Moreover, there is a perceived lack of funding within public agencies for these programs. Thus, alternative measures and combined efforts among PEV stakeholders will likely be needed to overcome funding barriers.

The following recommendations are focused on maximizing current resources and expanding training and education opportunities for San Joaquin Valley municipalities, EVSE installers and emergency first responders.

PEV Readiness Trainings for Municipal Staff

Recommendation: Implement additional PEV trainings targeting the needs of municipal staff. A further recommendation is that the region leverages the Electric Vehicle Infrastructure Codes and Standards curriculum developed by a coalition of industry and government stakeholders specifically designed for government officials, planners, managers and inspectors.

The region should hold at least two of these trainings. The first training should take place in the northern region of the San Joaquin Valley and the second training should be offered in the southern region. Each session should be made available via videoconference at each of the SJVAPCD satellite offices. The first training session should be scheduled in the beginning of 2013 and subsequent trainings held in the second or third quarters. The second training should build on the information covered in the first. In addition, it is recommended that workshop assessments from the first training be leveraged to help identify gaps in knowledge and assist in refining the curriculum for the second training.

Benefits: This program is nationally recognized and has been specifically developed for a one-day training to educate municipal staff on several aspects related to EVSE installation. In addition, holding two trainings that leverage each other will ensure relevant information is covered.

Training for EVSE Installers

Recommendation: Leverage funding from the SJVAPCD to implement the Electric Vehicle Infrastructure Training

Program for EVSE installers at Joint Apprenticeship and Training Committees (JATCs) in the San Joaquin Valley. The SJV PEVCC should conduct outreach to the Kern County Electrical, San Joaquin and Calaveras Counties Electrical as well as the Modesto/"San Joaquin Valley" JATC regarding the SJVAPCD's funding available under the Remove II Program for alternative fuel training. In addition, the SJV PEVCC should coordinate with SJVAPCD and the JATCs to assist in completing the application and any additional necessary requirements. Once funded, EVITP training should be available to all apprentices in their last semester (after they have passed the California certification exam).

Benefits: After local contractors complete the EVITP, each participant will have exposure to industry best practices in electric vehicle infrastructure installation, commissioning and maintenance. In turn, electric vehicle service providers (i.e., electric vehicle charging station manufacturers) and vehicle manufacturers will be more attracted to the area because of the skilled and knowledgeable workforce. Leveraging funding from SJVAPCD will offset and may cover the costs of implementing EVITP training at regional JATCs.

Safety Training for Emergency First Responders

Recommendation: SJV PEVCC and other relevant stakeholders should leverage the funding from DOE to conduct a regional needs assessment and subsequent alternative fuel training for emergency first responders. This will include working with the San Joaquin Valley Clean Cities organization to provide information regarding the need to implement first responder training for PEVs to police, firefighters and emergency personnel throughout the San Joaquin Valley. This process should leverage nationally recognized training developed by the National Alternative Fuel Training Consortium (NAFTC) to educate emergency personnel.

Benefits: NAFTC training will better equip emergency first responders to safely and efficiently address an accident involving a PEV. Furthermore, the training will cover vehicle history, operations, battery technologies, infrastructure and first responder procedures, such as vehicle identification, personal protective equipment and extrication. Leveraging DOE funding for training will help to deliver training at no cost to regional jurisdictions.



SECTION 9: OUTREACH TO LOCAL BUSINESSES AND RESIDENTS

This section focuses on PEV outreach to residents and businesses in the San Joaquin Valley. The first part recognizes the barriers and potential policy gaps toward providing PEV and EVSE education and outreach programs and events in the San Joaquin Valley. The next part provides a summary of past and ongoing PEV outreach efforts. The final part offers recommendations to assist municipalities and PEV stakeholder groups in providing PEV and EVSE outreach to businesses and local residents.

Policy Gaps and Areas for Improvement: Outreach to San Joaquin Valley Business and Residents

Overall, there exists a steep learning curve with regard to PEVs and EVSE that spans the entire market from the changes in fueling habits to consumers' interactions with electricity providers. This is especially true for municipalities, residents and businesses in the San Joaquin Valley. The limited amount of knowledge by all stakeholders throughout the San Joaquin Valley stresses the importance of supporting education and outreach across the PEV market spectrum.

Lack of PEV and EVSE Education at Regional Dealerships

Through our research, we have identified that car dealerships in the region have limited knowledge of incentives for PEVs and EVSE. For example, dealerships in the **City of Fresno** are directing prospective PEV owners to the SJVAPCD office for general information on PEV charging stations and PEV incentives. This highlights that many dealerships may not be aware of the significant amount of incentives that are available to residents within the jurisdiction of the SJVAPCD.

These incentives can be as high as \$12,500 per vehicle for individuals and businesses and up to \$22,500 per vehicle for public agencies and local governments (see Section 5: PEV and EVSE Incentives in the San Joaquin Valley).²⁹ In addition, lack of information about incentives on the

dealer level creates an extra step in the PEV purchasing process. Ideally, consumers would have clear information about incentives either before or when they step onto the dealer's lot. If prospective PEV drivers in the San Joaquin Valley visit an area dealer and the dealer fails to effectively communicate information regarding the PEV and EVSE programs and incentives available, then the potential for that customer buying a PEV decreases dramatically.

Limited PEV Knowledge and Budget Shortages for Municipalities

Communities in the San Joaquin Valley have experienced economic constraints, and as a result, San Joaquin Valley cities and counties have cut staff and significantly reduced public spending. These limitations in public agency resources are a significant barrier to implementing PEV education and outreach programs. Increasingly, these agencies are looking for ways to do more with fewer resources.

Many municipal staff we contacted and polled expressed that they are learning about this new PEV/EVSE market along with residents and businesses located in their respective jurisdictions. This is highlighted in the PEV readiness survey results, where staff from the cities of **Newman** and **McFarland** reported that there have not been any PEV outreach events or workshops conducted in their communities. This lack of knowledge, coupled with limited resources, creates a significant barrier to developing municipal PEV education and outreach programs targeting local residents and businesses. Despite this, staffs from the **City of Fresno** and **PG&E** have collaborated on numerous efforts to help drive PEV consumer awareness and promote PEV-user rates for PG&E customers in the Fresno area.

No PEV Resources Available on San Joaquin Valley Municipally Owned Utility Websites

Municipally owned utilities (MOUs) in the San Joaquin Valley do not have a website or accessible link dedicated

²⁹ The incentive amount for residents and local businesses assume the purchase of a battery electric vehicle that includes the federal tax credit, rebate from California's Clean Vehicle Rebate Project and rebate from the SJVAPCD DriveClean! Rebate Program.

to PEVs or PEV charging. It is important to note that the cities of **Modesto**, **Turlock**, **Lodi**, **Merced** and **Patterson** are serviced by MOUs and that each of these has a higher PEV adoption rate compared to the region as a whole.

In the fourth quarter 2012, CCSE conducted research of all MOUs in the San Joaquin Valley in order to gauge each utility's level of PEV readiness. The research results were collected by either personal phone calls with utility staff or research from each MOU website. The San Joaquin Valley MOUs are:

- **Modesto Irrigation District**
- **Turlock Irrigation District**
- **Merced Irrigation District**
- **Lodi Electric**

According to our research, none of these MOUs had PEV resources available for area customers on their respective websites. In addition, no MOU offered PEV-specific rates to area PEV owners. While not specific to PEVs, the **Turlock Irrigation District (TID)** has an environmental and conservation section on their website dedicated to sustainability programs, such as energy efficiency, renewable energy and climate change. TID also offers residential and business customers an option to participate voluntarily in a renewable energy program called BGreen Program.³⁰ This program should be leveraged to possibly incorporate businesses providing PEV infrastructure and area dealers selling these vehicles.

Addressing Policy Gaps and Areas of Improvement

Overall, there has been limited outreach and education to businesses and residents in the San Joaquin Valley. However, some organizations and utilities have developed PEV-related websites and implemented consumer-focused events. The section below provides a brief description of some of these events and resources made available to residents and businesses in the San Joaquin Valley.

Regional PEV Websites

Pacific Gas & Electric (PG&E) PEV Website

*High PEV adoption cities in PG&E's service territory: **Stockton and Fresno***

PG&E's dedicated website (www.pge.com/pev) for PEVs offers an array of tools and PEV resources to help customers become "PEV ready." The website has a simple three-step "Get Plug-in Ready" resource and includes a step-by-step guide for PEV owners to choose their appropriate charging level, select PEV-specific rates and learn what to do in the case of upgrading their home electric service for PEV charging. The website also contains a PEV rate calculator that allows customers to estimate their PG&E electricity costs for various PEV models. In addition, the website houses a section for nonresidential customers interested in fleet charging and providing public charging or workplace charging for their employees.

Southern California Edison (SCE) PEV Readiness Website

*High PEV adoption cities in SCE service territory: **Bakersfield, Visalia and Tulare***

SCE has developed an extensive website (www.sce.com/ev) for consumers, businesses and local jurisdictions interested in PEVs. This resource provides information for SCE's residential customers to help them find rates for PEVs and tips for installation residential EVSE. In addition, a "tools and resources" page has information on PEV/ EVSE rebates, incentives and charging station equipment. Businesses within SCE's service territory also can find information on the benefits of installing PEV charging stations at businesses and multifamily housing units. EVSE installers also have access to information on safety guidelines and proper EVSE installation techniques. Lastly, SCE allows jurisdictions to link their city's website to SCE's "tools and resources" page to ensure city residents and businesses have the right information about PEV fueling and EVSE literature.

Plug-in and Get Ready Website

In early 2011, CCSE developed the Plug-in and Get Ready website (www.energycenter.org/pluginready) as a resource for homeowners, businesses, EVSE installers and government agencies in the San Joaquin Valley. The website provides a one-stop experience for answers about community readiness and planning for PEVs, charging infrastructure and EVSE. In addition to special sections for residents, businesses, EVSE installers and government entities, the website includes the Plug-in & Get Ready Blog. The blog houses resources and information for stakeholders interested in available PEV incentives, workshops, industry reports and PEV readiness best practices and lessons learned. The website also hosts information regarding the San Joaquin Valley Plug-in Electric Vehicle Coordinating Council (SJV PEVCC).

SJV PEVCC members and interested parties will be able to access meeting agendas, past meeting summaries, presentations and PEV/EVSE materials. San Joaquin Valley residents and businesses may also access this information to learn more about the working group meetings. Further, residents and businesses are encouraged to share their concerns, ideas and suggestions with the working group via e-mail or at the working group meetings. The working group will advise on the development of a strategic and regional-specific PEV readiness plan for the San Joaquin Valley by the end of 2013.

PEV Consumer Outreach — Clean Vehicle Rebate Project Workshops

Since 2010, CCSE has held three separate consumer-based workshops promoting the use of PEVs in the San Joaquin Valley. These workshops were held in the cities of **Fresno** and **Modesto** in association with outreach efforts to promote California's Clean Vehicle Rebate Project (CVRP).³¹ Each workshop provided a venue for San Joaquin Valley residents to learn about federal, state and local incentives and facilitated a connection with infrastructure and utility providers — elements that are central to the market deployment of clean fuel vehicles. Below are brief descriptions of each workshop, including total attendance figures and key presenters.

City of Fresno — Workshops in November 2010 and March 2012

On November 2, 2010, CCSE partnered with SJVAPCD, General Electric (GE), PG&E and SJV Clean Cities Coalition in hosting the first PEV consumer workshop in the San Joaquin Valley. The event was held at the SJVAPCD office in the **Fresno**, with approximately 30 people attending. Despite low attendance, audience members were exposed to the statewide rebates and incentives offered for clean vehicles under the CVRP, along with presentations on PEV utility rates and PEV impacts to the grid. In addition, representatives from GE provided an overview of EVSE technology and the residential installation process.

On March 17, 2012, CCSE partnered with SJVAPCD and PG&E in conducting another workshop in **Fresno**. Workshop attendance increased, with more than 70 participants. In addition to incentives and utility information, the workshop offered consumer test drives of available PEVs and a "PEV driver panel." The driver panel brought together local residents to provide firsthand accounts of "life as a PEV owner." Each panelist answered questions in their own words, further helping to reduce the complexity surrounding the PEV purchasing decision.

City of Modesto — July 2012

The CVRP, in conjunction with SJVAPCD, San Joaquin Valley Clean Cities Coalition and Modesto Irrigation District, hosted an electric vehicle workshop on July 21, 2012, with more than 80 local residents attending. The workshop covered an array of topics for area residents, including local and statewide rebates, PEV charging and California PEV infrastructure as well as a local PEV driver panel. The workshop concluded with the opportunity for attendees to view a selection of electric vehicles.

Recommendations for Regional Next Steps

PEVs and charging infrastructure are new to many residents, businesses and municipally owned utilities in the San Joaquin Valley. In order to support the development of the PEV market in the region, it is critical to expand PEV outreach and education to consumers

³⁰ The Turlock Irrigation District BGreen Program, allows TID customers to opt into a rate system based on the cost of purchased renewable energy certificates. The BGreen Program is based on energy consumption and ranges from 0.5 to 4 cents per kWh, and the rate is adjusted in June and December of each year. The program will cost about \$10 to \$40 per month for the average TID residential customer and is in addition to a customer's regular bill. www.tid.org/environment-conservation/renewable-energy/bgreen-program

³¹ CCSE has administered the CVRP for the California Air Resources Board since the program's inception in 2009

and local businesses. This assessment recognizes that many jurisdictions in the San Joaquin Valley face budget constraints. As a result, the suggestion is that municipalities not lead PEV outreach efforts, but instead, play a central role in educating their residents by taking advantage of existing outreach resources (e.g., utility websites) to implement low- and no-cost methods to increase outreach to consumers and local businesses.

Clearly, more robust outreach to residents, businesses and public agencies will be necessary to expand the PEV market in the San Joaquin Valley. This will likely include additional investment and PEV champions within local government. The following five recommendations are focused on increasing PEV outreach to local residents and business by leveraging existing resources, supporting and expanding outreach from partnering organizations and developing new outreach efforts tailored to the San Joaquin Valley.

Develop PEV Resources Page on Regional Municipal and Municipally Owned Utility Websites

Recommendation: Create and publish a PEV resources page on each municipal and MOU website in the San Joaquin Valley. Each of these web pages should provide links to helpful regional online resources as well as links to state and federal resources.

Suggested links to include on PEV resources web page:

- General PEV readiness — CCSE's Plug-in and Get Ready, www.energycenter.org/pluginready
- Utility specific:
 - Pacific Gas & Electric PEV website, www.pge.com/electricvehicles/
 - Southern California Edison PEV website, www.sce.com/info/electric-car/
- General PEV information — PEV Resource Center, www.driveclean.ca.gov/pev
- PEV charging station locator — DOE Alternative Fuel Data Center, www.afdc.energy.gov/locator/stations/

Benefits: Provide relevant information to residents and business at a minimal cost to municipalities.

Support, Coordinate and Expand Existing PEV Consumer Education

Recommendation: At a minimum, it is suggested that public agencies include links on municipal websites to consumer training and education efforts from partner organizations such as CCSE, SCE and PG&E. In addition, municipalities should promote these trainings through other outreach channels to residents (e.g., newsletters, mailers, etc.). It is also recommended that SJV PEVCC, SJV Clean Cities Organization and SJVAPCD work with partner organizations to expand consumer outreach events throughout the San Joaquin Valley.

Benefits: Leveraging existing funded training and education programs in the region assists municipalities in increasing education opportunities at a minimal cost. Expanding existing outreach efforts will likely require additional investment; however, collaborating with partner organizations will minimize additional costs associated with implementing this outreach.

Utilize the SJV PEVCC to Promote PEV and EVSE Incentives to Local Governments

Recommendation: Leverage the network of SJV PEVCC members to distribute educational materials and concise messaging that highlights the opportunity available through the DriveClean! and Public Benefit programs as well as the economic and environmental benefits of PEV adoption.

Benefits: Employs an existing network of PEV stakeholders to efficiently direct messages of the significant incentives available and the public benefits from PEV adoption. In turn, greater understanding of these incentives and benefits will assist in PEV adoption in local government fleets. Further, positive messaging and broader public knowledge of PEV benefits will assist in gaining political support for backing PEV- and EVSE-friendly policies.

Leverage SJV PEVCC and SJVAPCD to Implement PEV Dealer Education

Recommendation: Utilize SJV PEVCC to implement a PEV dealership education initiative. SJV PEVCC should coordinate with SJVAPCD outreach and communication staff to target area dealerships currently selling PEVs in the San Joaquin Valley and provide specific PEV educational

materials, including the "PEV 101" educational section of this assessment, along with a user-friendly document highlighting federal, statewide and SJVAPCD clean vehicle rebates and incentives. These materials also will need to include EVSE installation materials and local utility contact information (see recommendation *Create and Distribute Regionally Focused EVSE Installation Consumer Education Materials*).

Benefits: Educates a vital group in the PEV market, with the goal that dealers will distribute PEV resources and information and in turn, educate prospective PEV drivers during the purchasing process about available PEV incentives, the EVSE installation process and other accessible PEV resources.

Create and Distribute Regionally Focused EVSE Installation Consumer Education Materials

Recommendation: Deploy regionally focused consumer education materials leveraging existing materials, such as the EVSE consumer decision flowchart produced by the Capital Area PEV Coordinating Council (PEVCC) in the Sacramento region. CCSE has updated the flowchart with information from the San Joaquin Valley (provided on next page). Municipalities are encouraged to provide this user-friendly material on municipal websites as well as at relevant consumer-facing municipal offices (e.g., permitting desks). In addition, SJV PEVCC should work with PG&E, SCE and each MOU to expand these materials.

Benefits: Provide relevant and easy-to-use resources for residents and business at a minimal cost to municipalities.

Your Guide to Plug-In and Get Ready*

There are many different ways to charge your PEV. You can charge at public charging stations near your work or home, use the existing electrical outlets in your home (Level 1), or install a Level 2 charging station in your home.

Use this guide to help you decide if installing a Level 2 charging station in your home is the right choice for you and learn about the steps needed for Residential Electric Vehicle Supply Equipment (EVSE) installations. At this time, this guide is intended for use by single-family residences only. If you rent your home, be sure to discuss any home modifications with the property owner first and visit your local utility provider's website for more information.

Level 1 (120 volt) — PEVs come with a 120-volt charging cord that enables PEV owners to charge their PEV with any conventional 120-volt three-pronged outlet. While it takes longer to charge, Level 1 (L1) allows PEV drivers to plug in without the installation of a dedicated charging station.

Level 2 (208 to 240 volt) — This level of charging requires a charging station, also known as electric vehicle service equipment (EVSE), be purchased and installed and generally involves the installation of a dedicated circuit at either the PEV owner's home or where a public charging station is installed. Currently, Level 2 (L2) EVSE makes up the majority of public charging stations across California.

 <p>Will you be charging your PEV at home?</p> <p>YES</p>	 <p>Do you have a designated parking place for your PEV, like a garage or parking space with access to an electrical outlet?</p> <p>YES</p>	 <p>Do you want to take advantage of reduced rates from your utility provider (if available) or Level 2 charging?</p> <p>YES</p>	<p>WWW</p> <p>A typical process to install a residential Level 2 EVSE includes:</p> <ul style="list-style-type: none"> • Have a contractor check the electricity panel capacity and load balance • Contact your local utility: www.pge.com/pev www.sce.com/ev www.mid.org www.mercedid.org www.tid.org www.lodielectric.com • Get a permit from the City or County • Install the EVSE and submeters • Complete a building inspection <p>Visit www.energycenter.org/pluginready to learn more</p>
<p>NO</p> <p>WWW</p> <p>Visit the AFDC website for a list of public charging locations where you can charge your PEV. Available at http://www.afdc.energy.gov/</p> <p>PLUG-IN & GET READY!</p>	<p>NO</p>  <p>Significant improvements may be needed in order to charge your PEV at home. Start by contacting a qualified electrical contractor to discuss your needs.</p> <p>PLUG-IN & GET READY!</p>	<p>NO</p>  <p>You can use an existing electrical outlet (120 VAC, 15/20 A) to charge your PEV.</p> <p>PLUG-IN & GET READY!</p>	<p>WWW</p> <p>PLUG-IN & GET READY!</p>

*Adapted from *Take Charge I: A First Step to PEV Readiness in the Sacramento Region*, a report from SACOG and the Capital Area PEV Coordinating Council on preparing the region for Plug-In Electric Vehicles.

