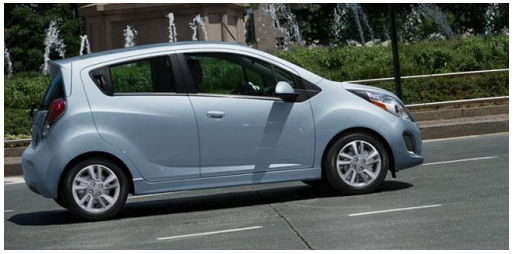
Workplace Charging

May 7, 2013

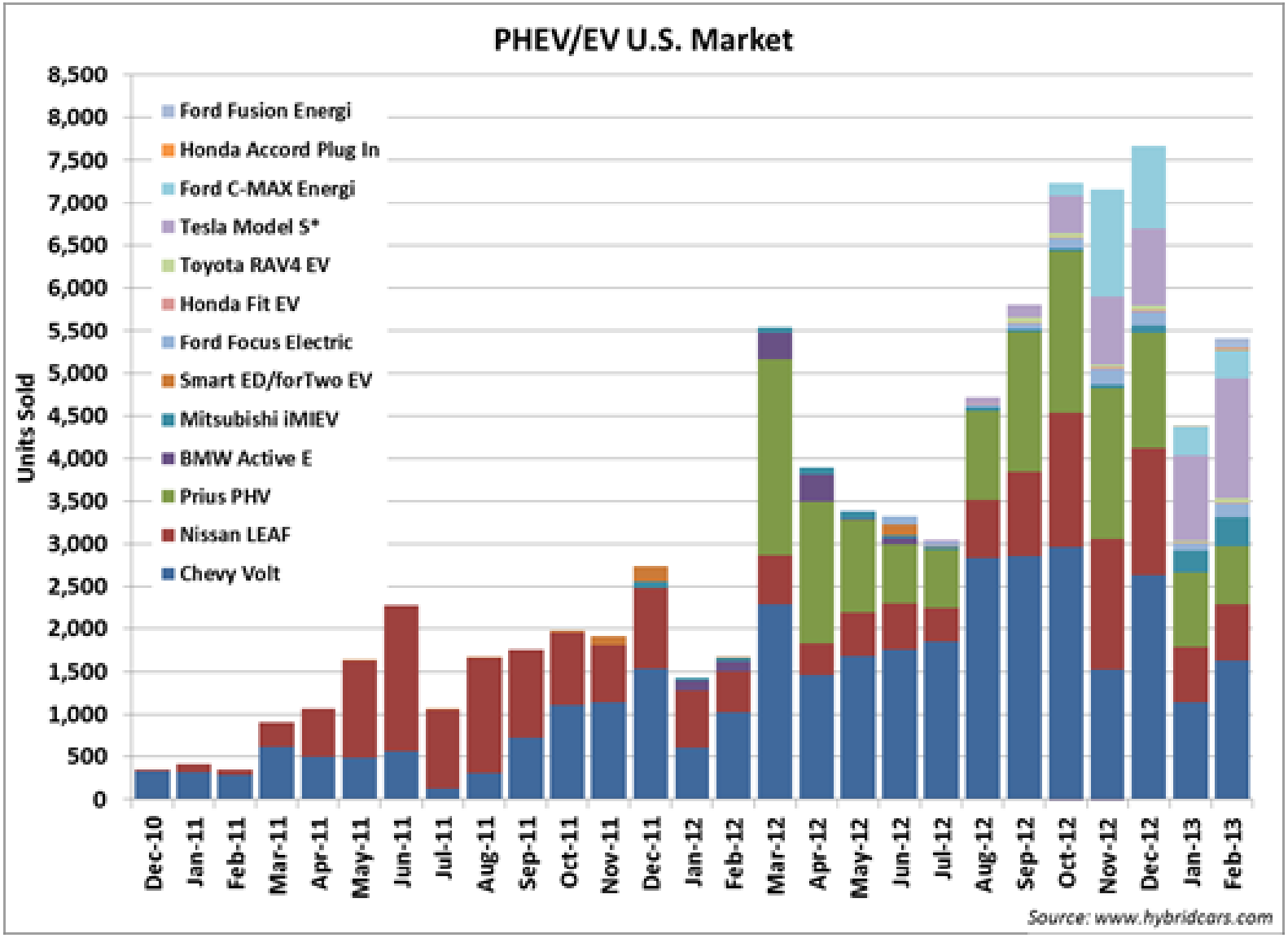
Jasna Tomic – CALSTART

Employer EV Initiative
Empowering America's Employers

Growing Number of PEV Models



Consistent Growth in Sales



Charging Infrastructure

TYPE	AC	DC
Level 1	120 V ≤ 12. 16 amps ≤ 1.44, 1.92 KW	200–450 V ≤ 80 amps ≤ 19.2 KW
Level 2	208 – 240 V ≤ 80 amps ≤ 19.2 KW 1Φ	200-450 V ≤ 200 amps ≤ 90 KW
Level 3	TBD Assumed ≥ 19.2 KW 1Φ or 3Φ	200–600 VDC ≤ 400 amps ? ≤ 240 KW ?

Electric Vehicle Service Equipment





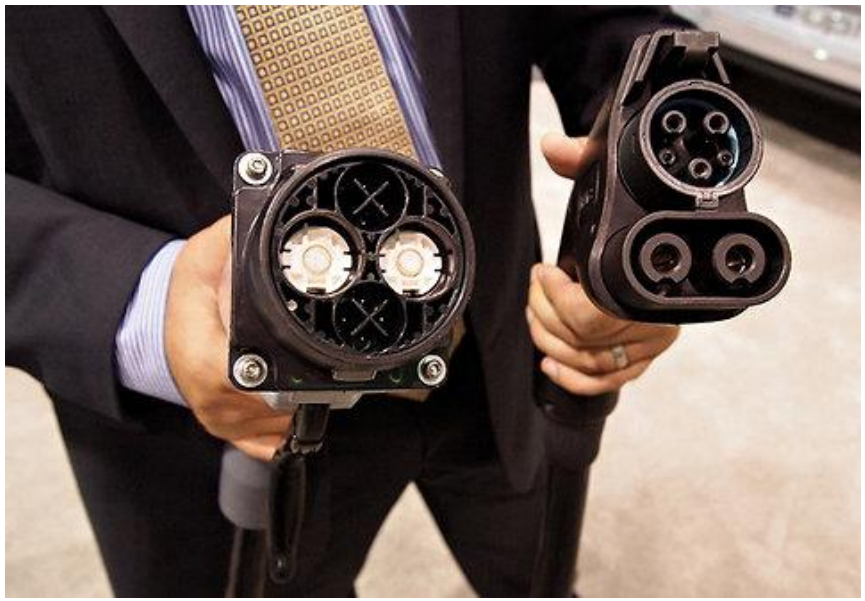


Connectors

» AC Level II

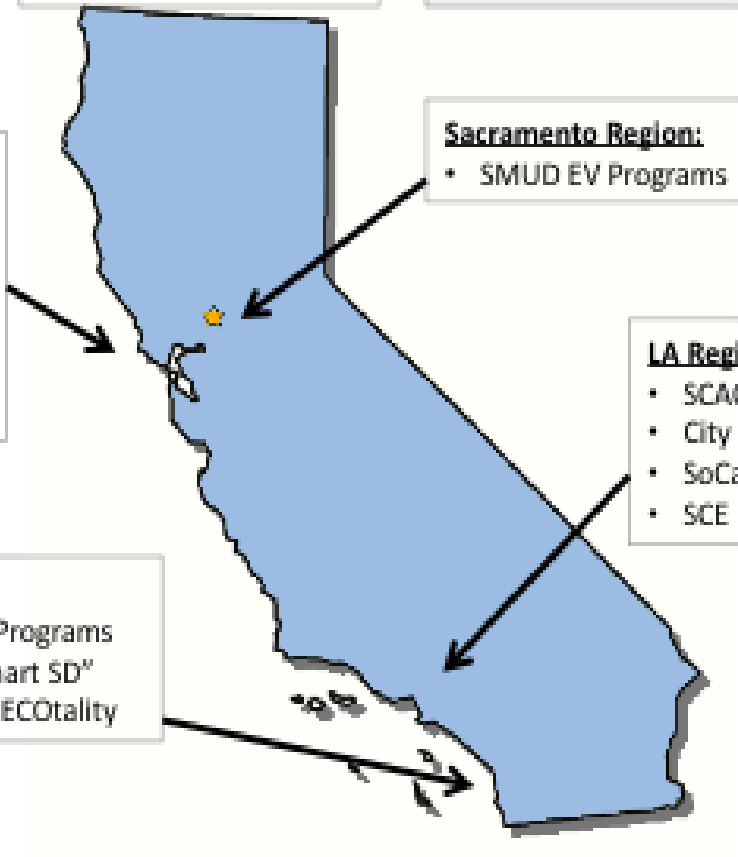
» AC Level I

» DC Connectors CHAdeMO and Combined



Statewide:
- PEV Collaborative
- Ready, Set, Charge
- CEC - AB118, PIER
- ARB – ZEV Reg, AB118
- PUC – Utility rules
- SB 71 Tax exemption
- UCD PH&EV Center

National/Inter Connection:
- RMI Project Get Ready
- Clinton PEV Cities (LA)
- EDTA Outreach, Maps
- U.S. DOE Clean Cities
- EPRI Grid Programs
- SAE and NEC standards
- Plug In America outreach



Sacramento Region:
- SMUD EV Programs

Bay Area:
- MTC Climate Program
- BAAQMD Incentives
- BACC Strategic Council
- EV Corridor Planning
- City SF Fleets, MDU
- BP Battery Switch demo

LA Region:
- SCAQMD Incentives
- City LA home charging
- SoCalEV Coalition
- SCE EV fleet programs

San Diego:
- SDG&E EV Programs
- City SD "Smart SD"
- EV Project, ECOtality

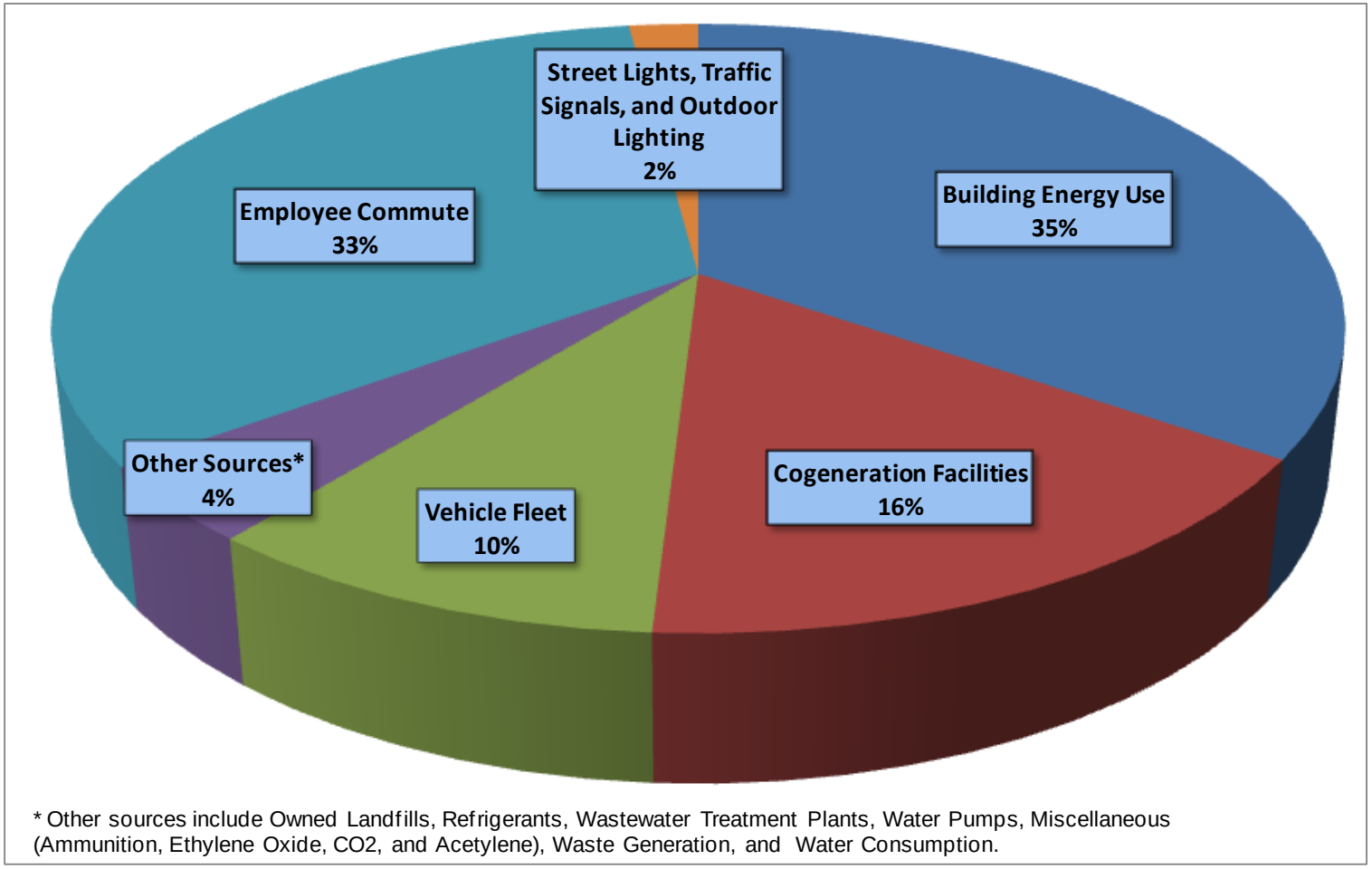
PEV Partnerships & Programs by Region

www.pevcollaborative.org/partnerships-programs-by-region

CA Statewide and Regional PEV Readiness Reports

pevcollaborative.org/pev-readiness-reports

Vehicles Significant Source of Municipal GHG in LA County



* Other sources include Owned Landfills, Refrigerants, Wastewater Treatment Plants, Water Pumps, Miscellaneous (Ammunition, Ethylene Oxide, CO_2, and Acetylene), Waste Generation, and Water Consumption.

Source: R. Teebay, Nov 2, 2011.

WHY EVs Are Important

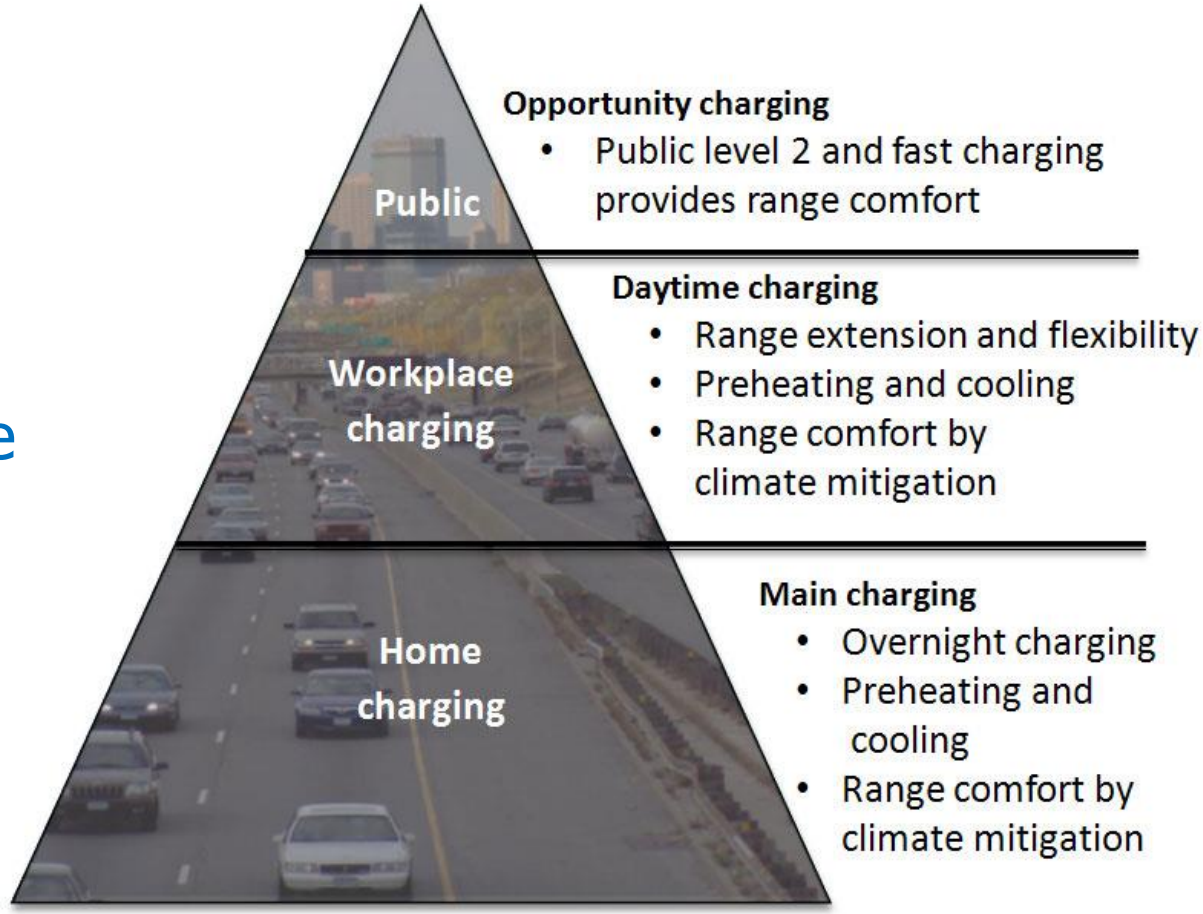
- The AQMD's Rule 2202 requires employers with 250 employees at a site to provide some mitigation.
- 44,000 of the County's 100,000 employees are subject to Rule 2202.
- The average employee commute is 24 miles one way.
- Emissions from the commutes of 44% of the County's employees generates 428,000 $MTCO_2e$ (Scope 3 emissions) - *more than 3x the emissions of the County's Fleet operations*.

[Source; R. Teebay, Nov 2, 2011, UCLA]

Workplace Charging

Can double daily driving range, enabling even long distance commuters to use EVs.

Adds flexibility to work day and range comfort.



Employer Benefits of Workplace Charging

- Employee benefit
- Attraction and retention of employees
- Green corporate image
- Leadership
- GHG reduction
- LEED points

EV Employer Initiative

- ***What?*** A series of FREE,1 hour, web-based meetings that will occur on the last Tuesday of each month. Next meeting May 28.

- ***Why?*** To cause a measurable increase in workplace charging locations in the state, and an increase the adoption of electric vehicles.

- ***How?*** By sharing successes, information, and challenges between California employers engaged and interested in installing electric vehicle charging systems at their workplaces.

- ***Who?*** Employers (public and private), EVSE providers, building owners, building landlords, and OEMs

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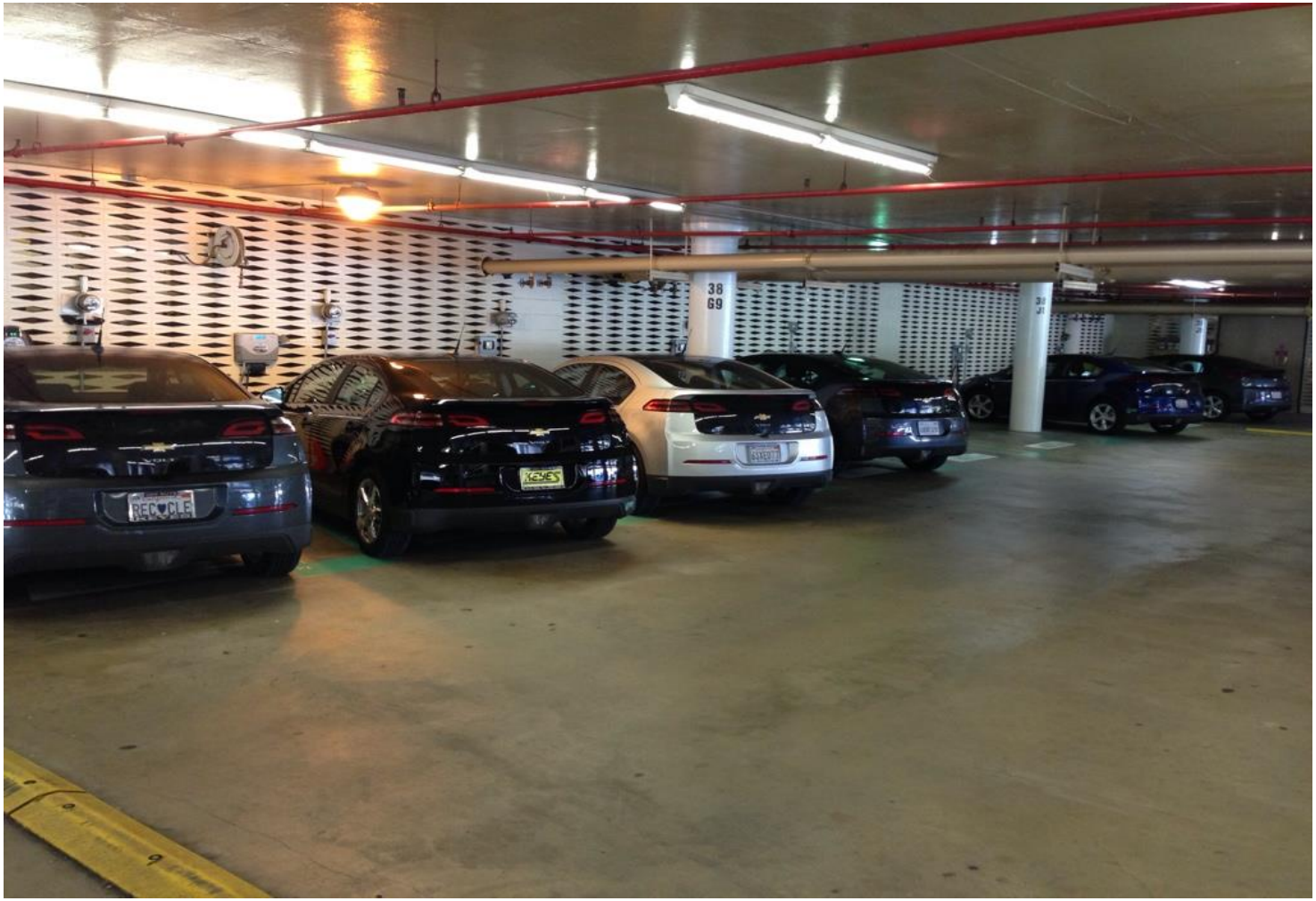
CALIFORNIA DEPARTMENT OF GENERAL SERVICES

ELECTRIC VEHICLE CHARGING STATIONS

- The DGS was awarded funding through grants awarded by the California Energy Commission and Department of Energy for the purchase and installation of 24 level II Electric Vehicle (EV) Charging stations. The 24 EV stations were installed in March 2012 by Coulomb Technologies.
- The EV stations have been used 1,050 times beginning in March 2012 to November 2012, or approximately 44 times a month. (Usage data obtained from the ChargePoint.net website).
- The 24 EV stations currently in use are used by both monthly and public parkers.
- The DGS plans on installing 9 additional EV charging stations at the Fleet Garage located 1416 10th Street in Sacramento to support the DGS electric vehicle fleet.

LADWP EV Charging



EV Employer Initiative

GREEN IT. MEAN IT.

EV Chargers at Fox Studios

Currently have 20 Level 2 chargers

- 17 Blink and 3 Clipper Creek
- 4 in each parking structure, 3 on lot, 1 in transportation

40 - 50 users at present

Why Install EV Chargers?

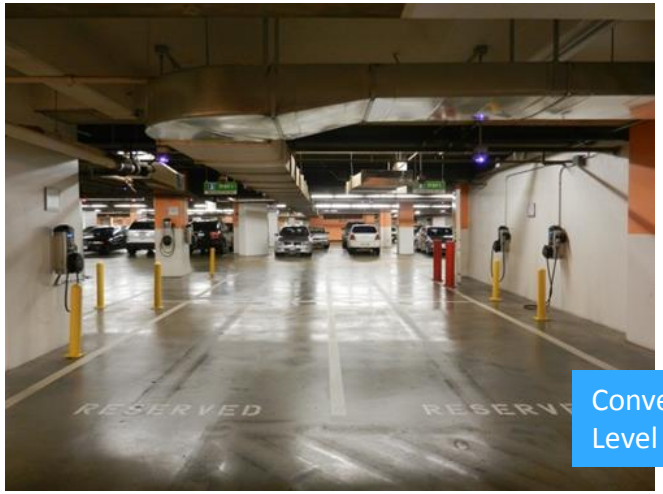
Employee interest

- Hybrid & EV incentive program

EVs in fleet

CBRE Asset Services – Property Management

15 Electric Vehicle Charging Stations are available in project parking structure.



Convenient Level P1 Access

Full Charge Notification

Credit/Debit Card Payment

CBRE Asset Services

Filling Critical Gaps

Discussion on following topics

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A CALSTART PROJECT

1. **Payment policy**
   - Whether to require payment from their employees for use of company charging equipment or offer it as an employment benefit,
2. **Pricing policy**
   - What pricing structure is appropriate if choosing to require payment - pay $/h or for actual electricity charged ($/kWh)?
3. **Purpose**
   - Whether company charging stations are required to be open for public use
4. **System Optimization**
   - How to optimize parking to ensure that a car doesn't occupy a charging space long after it is fully charged.
   - How to prioritize charging of fleet vehicles vs. employee vehicles
5. **Infrastructure**
   - **Installation process**
     - What types of chargers to use, UL listing, certification, upgrades, permitting, etc.
   - **Options**
     - Whether to choose 24O vs. 120 Volt chargers or even fast chargers in some cases – and how many chargers per vehicle.
     - Connecting chargers with clean DG
     - V2X – integrating with the building load and managing the peak load of building or site (financial incentives)
     - V2X or V2G – play in demand response program of utility or ancillary services with CA ISO
   - **Costs and Benefits**
     - How to assess and avoid demand charges from the utility during peak load periods
6. **Incentives**
   - Whether to use free charging as an incentive vs. company-paid lease
7, **Internal Procedures**
   - How to secure employee buy-in
   - How to secure senior management buy-in

Best Practices for Workplace Charging – Expected May 2013

1. Identifying and Overcoming Barriers to Workplace Charging
2. Process for Charging Infrastructure Installation at the Workplace
    - Pre-planning considerations
    - Installation Flowchart
    - Infrastructure Options
    - Cost considerations
3. Value Proposition of PEV's and Workplace Charging
    - Benefits for employers and employees
    - Assessing employee demand
    - Gaining internal support
    - Pricing policies
    - Recovering costs
4. Employer Case Studies
    - Internal policies and strategies being implemented today

Additional Resources

- So Cal EV - www.socalev.org/index.htm
- Infrastructure from LA County RFP- www.aqmd.gov/tao/Demonstration/ElectricHybrid/SoCalEV_Ready_Program.htm
- California Plug-in Collaborative - www.pevcollaborative.org
- CARB – Drive Clean www.driveclean.ca.gov

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CALSTART
Clean Transportation Technologies and Solutions

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CALSTART

Workplace Charging Challenge:
part of the EV Everywhere Grand Challenge

Sarah Olexsak, Workplace Charging Challenge Coordinator
Vehicle Technologies Office
Office of Energy Efficiency and Renewable Energy
US Department of Energy

The American Reinvestment and Recovery Act: largest investment to support vehicle electrification in U.S. history

ARRA: Largest Charging Infrastructure Deployment in History

- $1.5 billion for manufacturing and deployment of next generation batteries
- $500 million for electric-drive components manufacturing
- $400 million for transportation electrification demonstration (16,000+ charging stations and 9,000+ vehicles deployed to date)

What is the EV Everywhere Grand Challenge?

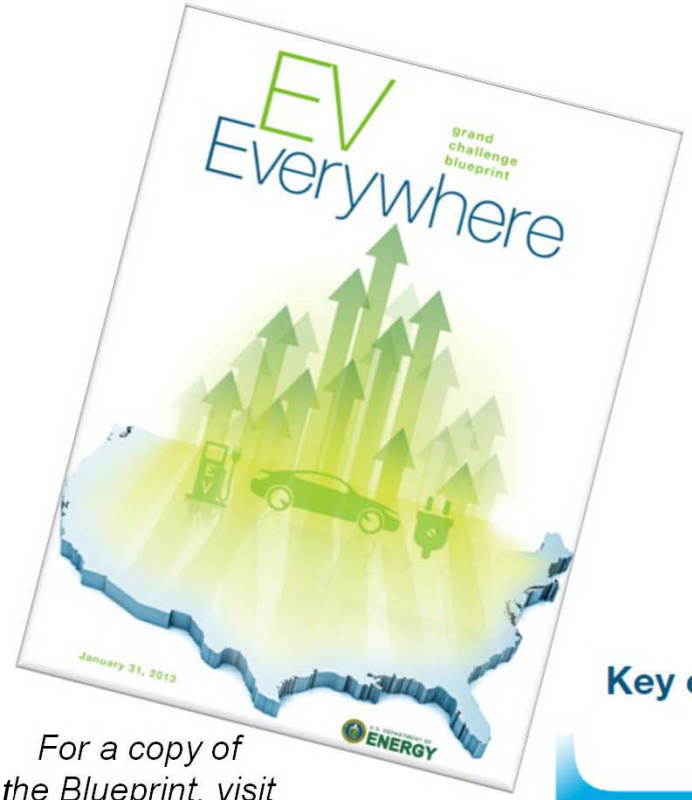
- **March 2012**
  Challenge announced
- **June 2012**
  Initial Framing Document published
- **Summer/Fall 2012**
  Stakeholder input gathered
- **January 2013**
  EV Everywhere Blueprint published

President Obama, March 7, 2012, Daimler Truck Manufacturing Plant, Mount Holly, North Carolina

EV Everywhere Goal

Enable the U.S. to be the first in the world to produce plug-in electric vehicles that are as affordable and convenient as today's gasoline-powered vehicles within the next 10 years.

EV Everywhere Blueprint: a “living strategic framework”



For a copy of the Blueprint, visit electricvehicles.energy.gov

Key elements needed to meet the *EV Everywhere* Challenge

Workplace Charging Challenge goal: Increase the number of U.S. employers offering workplace charging by tenfold in 5 years

Partner Pledge

- Assess employee demand
- Develop a Partner Plan
- Deploy WPC & share success

Ambassador Pledge

- Develop & implement an Ambassador plan to support & promote WPC

DOE Pledge

- Provide technical assistance
- Establish network to share best practices
- Recognize success

DOE Secretary Chu, January 31, 2013
Workplace Charging Challenge launch at the Washington Auto Show

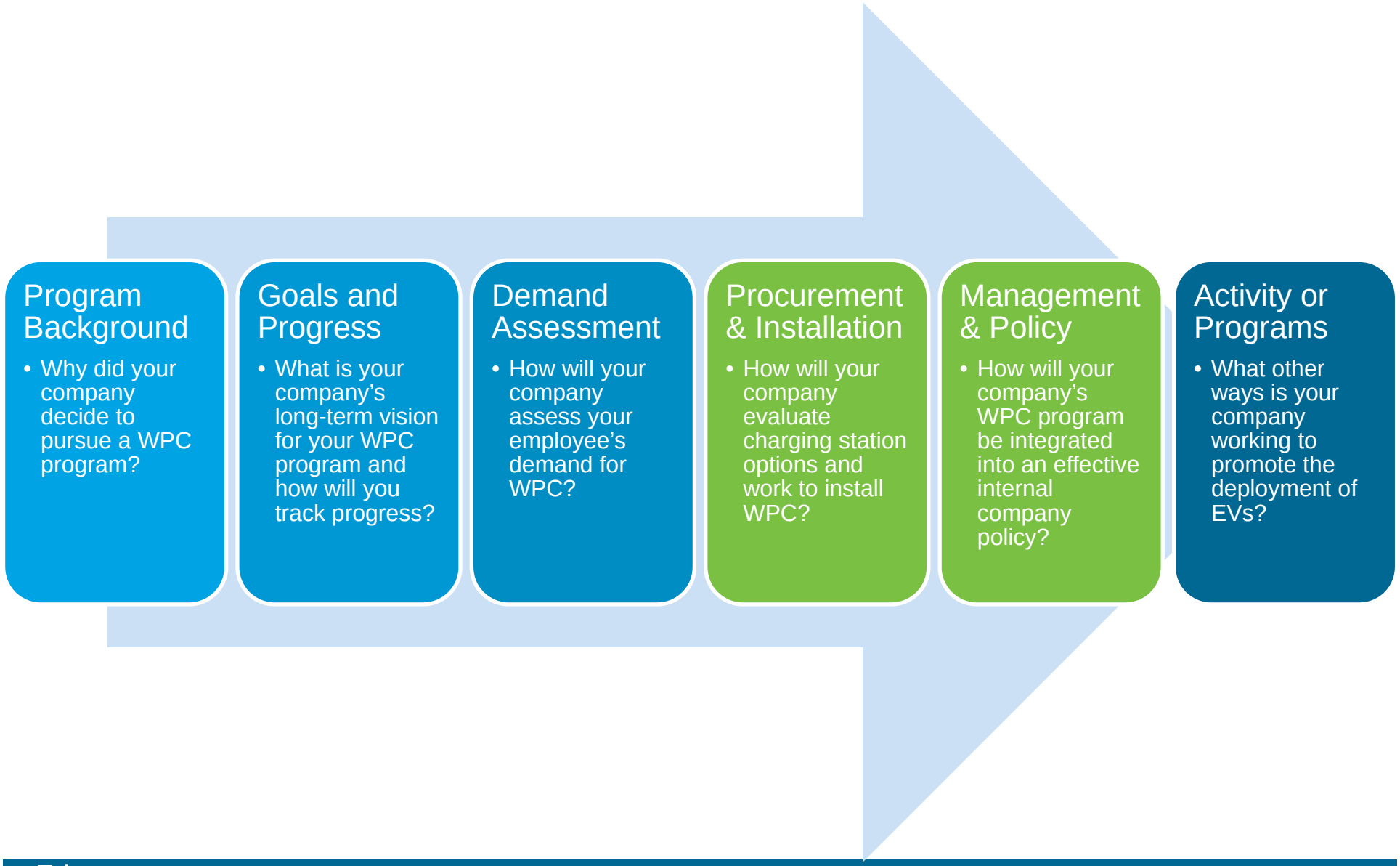
Workplace Charging Challenge

Workplace Charging Challenge participants

31 Partners

10 Ambassadors

Workplace Charging Challenge Partner Plan



DOE's most important role: provide technical assistance by collecting and sharing best practices

Procurement & Installation

- Understanding incentives
- Understanding charging station options
- Working with electrical contractors
- Working with property owners
- Permitting & zoning
- ADA compliance

Management & Policy

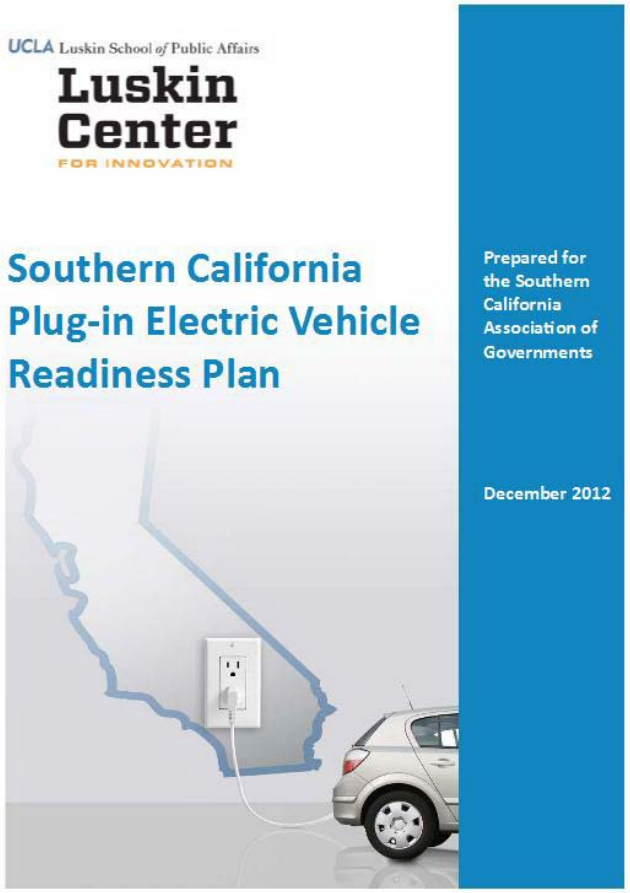
- Internal policy development
- Legal liability
- Fairness issues
- Parking priority, availability & etiquette
- Management logistics
- Energy costs and demand charges

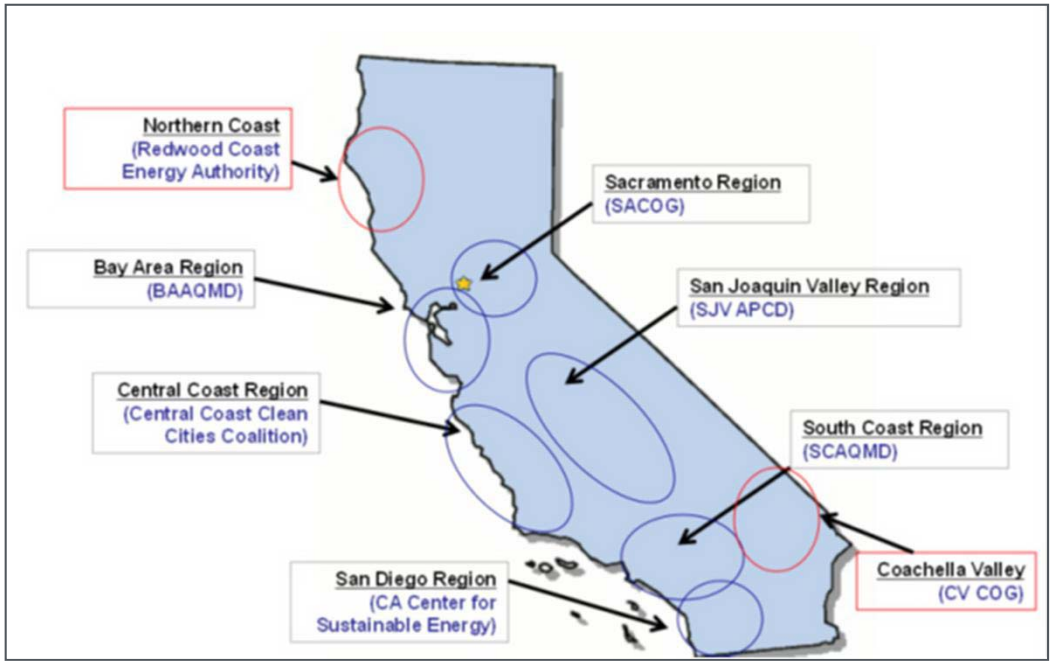
Beyond Workplace Readiness – PEV Community Readiness

- Detailed planning documents
- Codes and permitting
- Siting and design
- Local market analysis
- Outreach and education

16 projects in 24 states, $8.5 million

PEV Community Readiness in Southern California





For a copy of the Plan, visit
http://www.pevcollaborative.org/sites/all/themes/pev/files/docs/SouthCoast_PEV_Readiness_Plan_Main.pdf

For More Information

EV Everywhere and the
Workplace Charging Challenge

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