



CALIFORNIA

PLUG-IN ELECTRIC VEHICLE
COLLABORATIVE

The Growing California Plug-in Electric Vehicle Market

www.PEVCollaborative.org
updated: April 2014



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Mission

The California Plug-In Electric Vehicle Collaborative is a public/private organization focused on accelerating the adoption of PEVs to meet California's economic, energy and environmental goals. Using the expertise of each member, the PEV Collaborative **convenes**, **collaborates** and **communicates** on emerging PEV market trends and works to address challenges and enable strong PEV market growth.

Automakers

- BMW
- Daimler
- Ford
- GM
- Honda
- Kia
- Nissan
- Tesla
- Toyota

State Government

- Air Resources Board
- CA Energy Commission
- CA Public Utilities Commission
- Legislature members
- Governor's office

Local Government

- Bay Area AQMD
- South Coast AQMD
- Northern Sonoma APCD

Utilities

- LADWP
- PG&E
- SCE
- SDG&E
- SMUD

Education/Research

- California Center for Sustainable Energy
- CalETC
- CALSTART
- EPRI
- Plug In America
- UC Davis – ITS
- UCLA – Luskin Center

Environmental NGOs

- American Lung Association
- Center For Energy Efficiency And Renewable Technologies
- International Council for Clean Transportation
- National Resources Defense Council
- Union of Concerned Scientists

EVSE/Network Providers

- AeroVironment
- Clean Fuel Connection
- ChargePoint
- Greenlots
- NRG
- Recargo

PEV Types

WHAT IS A PEV?

A PEV is a Plug-in Electric Vehicle that runs at least partially on battery power and is recharged from the electricity grid.



Pure Battery Electric Vehicles (BEVs) run on electricity stored in batteries and have an electric motor rather than a gasoline engine.



Plug-in Hybrid Electric Vehicles (PHEVs) combine two propulsion modes in one vehicle – an electric motor (that is battery-powered and can be plugged in and recharged) and a gasoline engine (that can be refueled with gasoline).

BEVs and PHEVs – What's the difference?

	BEV	PHEV
Emissions	Zero emissions from vehicle; only emissions are from utility electricity generation mix	Zero emissions when driving on electricity. Emissions when driving on gasoline depend on engine emissions certification
Range	Generally 70 to 100 miles (proportional to battery size) ; some models are higher	All electric range varies from 15 to 35 miles (proportional to battery size); gasoline range is about 300+ miles
Propulsion	Electric motor / battery only	Electric motor / battery <i>plus</i> gasoline engine
Re-fueling	Recharge with electricity	Recharge with electricity <i>and/or</i> refuel with gasoline

Source: California PEV Collaborative (CG2-2).

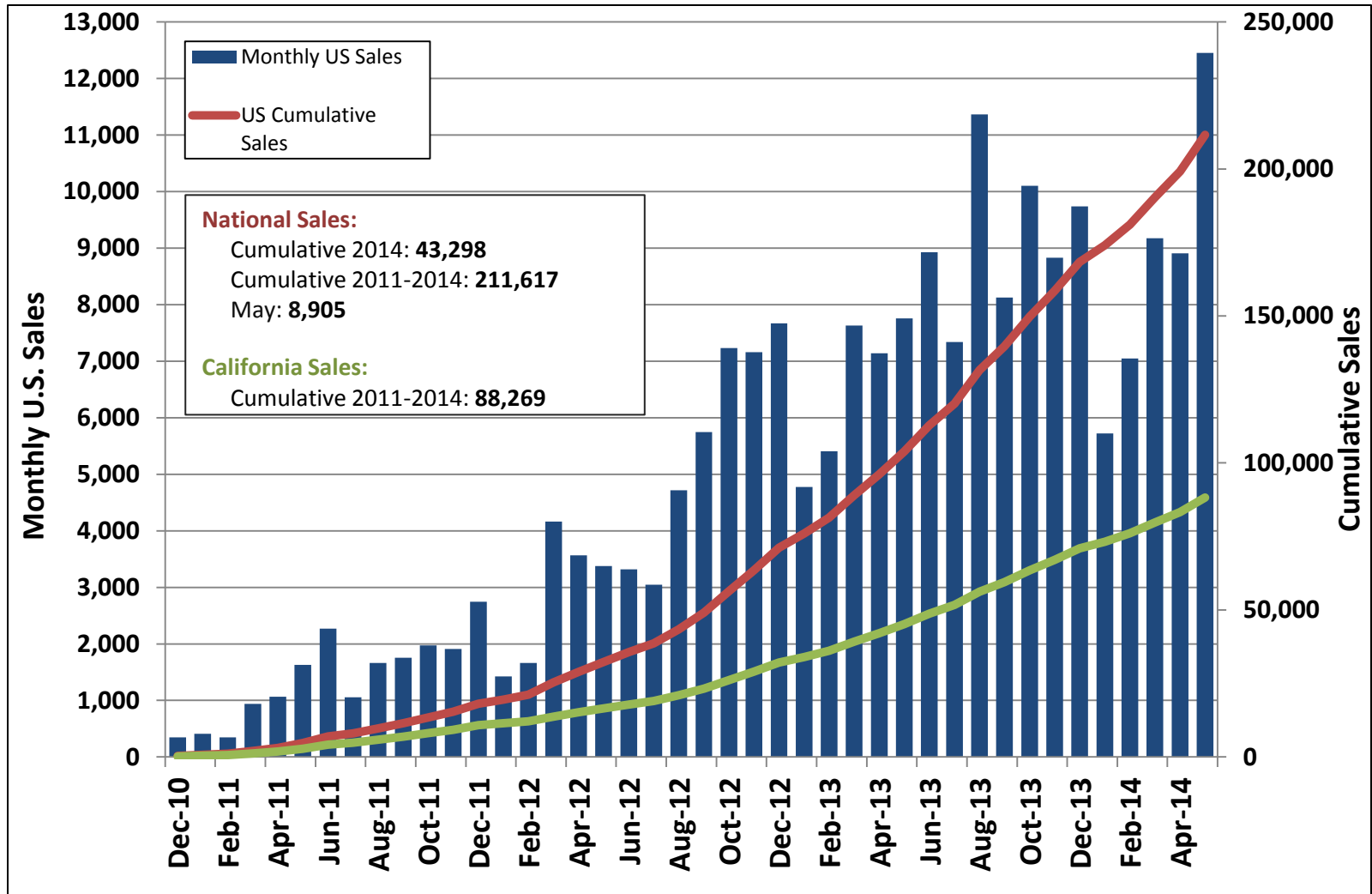
BEV and PHEV Graphics courtesy of the Electric Power Research Institute, *Plugging In: A Consumer's Guide to the Electric Vehicle*, 2011.



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Plug-in Electric Vehicle Sales



Note: Approximation assumes CA sales are 40% of national sales.

Reference: www.hybridcars.com

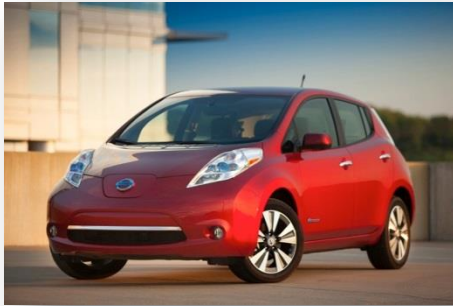
Visit www.PEVCollaborative.org for more information



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Many PEV Models Available. More Coming.



NISSAN

LEAF



Focus Electric



Volt



C-Max Energi



TESLA

Model S



Fusion Energi



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Many PEV Models Available. More Coming.



Prius Plug-in



500e



Rav 4



Fit EV



Spark



Accord Plug-in



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Many PEV Models Available. More Coming.



BMW Group



i3



smart

Fourtwo



ELR



iMiEV



PORSCHE

Panamera



TESLA

Model X



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Many PEV Models Available. More Coming.



BMW Group



i8



TOYOTA

Scion iQ EV



Mercedes-Benz

B-Class Electric



SUBARU

Outlander



KIA MOTORS
The Power to Surprise™

Soul EV



NISSAN

e-NV200

Charging PEVs

HOW LONG DOES IT TAKE TO CHARGE A PEV?

Charging Level	Power Supply	Charger Power	Miles of Range for 1 Hour of Charge	Charging Times From Empty to Full*	
				BEV	PHEV
Level 1	120VAC Single Phase	1.4 kW @ 12 amp (on-board charger)	~3 - 4 miles	~17 Hours	~7 Hours
Level 2	240VAC Single Phase up to 19.2 kW (up to 80 amps)	3.3 kW (on-board)	~8 - 10 miles	~7 Hours	~3 Hours
		6.6 + kW (on-board)	~17 - 20 miles	~3.5 Hours	~1.4 Hours
DC Fast Charge Level 2	200 – 450 VDC up to 90 kW (approximately 200 amp)	45 kW (off-board)	~50 - 60 miles (~80% per 0.5 hr charge)	~30 - 45 Minutes (to ~80%)	~10 Minutes (to ~80%)

Source: California PEV Collaborative (CG3-3).

*SAE "Charging Configurations and Rating Terminology", Society of Automotive Engineers Hybrid Committee, version 031611, 2011.

SAE Assumptions: BEV = 25kWh usable battery; PHEV = 8kWh usable battery; Calculations reviewed and edited by EPRI.

Battery Electric Vehicle (BEV) assumes a 25 kWh usable battery pack size; for purposes of this table SAE data reflect a charging scenario of "empty to full" where charging starts at 20% State of Charge (SOC) and will stop at 100% SOC.

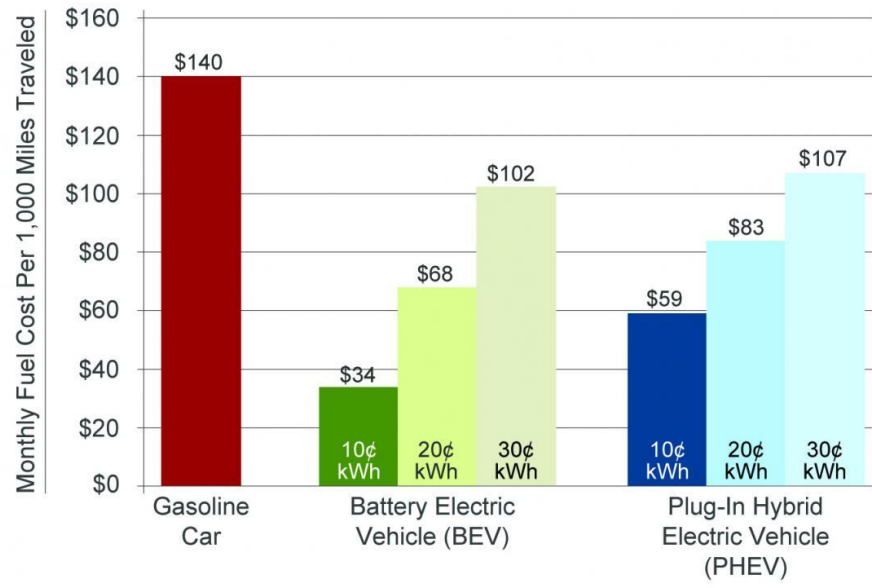
Plug-in Hybrid Electric Vehicle (PHEV) assumes an 8 kWh usable battery pack size; charging starts from 0% SOC since the hybrid mode is available.



Driving on Electricity can be Cheaper

- Driving on electricity is like paying \$1.50 a gallon for gasoline*
- Utilities offer special rates for PEVs that encourage off-peak charging
- PEVs can have less maintenance costs

DRIVING ON ELECTRICITY CAN BE CHEAPER



Source: California PEV Collaborative (CG4-1).

Assumptions

Gasoline Passenger Car, Average New Car, California 2010: 26 miles per gallon (MPG).
Battery Electric Vehicle (BEV): Example - 0.34 kWh/mile, fueled only by electricity; vehicle efficiency varies by model.

Plug-in Hybrid Electric Vehicle (PHEV): Example - 0.36 kWh/mile; 35 mile electric range; 37 MPG; vehicle efficiency varies by model. PHEV drives 2/3 miles on electric fuel, 1/3 miles on Premium gasoline fuel.

California Retail Gasoline Prices: \$3.635 / gallon Regular; \$3.849/ gallon Premium, January 2012. (See Additional Data and Sources)

* When paying \$0.15 kWh



PEV Infrastructure

- CA has over 4600 Level 2 and 129 DCFC charging points*
- Over \$38M awarded in CA state funding for 8,646 chargers (2010-2014)
- 200 NRG “Freedom Stations” and 10,000 Level 2 “make-ready’s” for multi-unit dwellings, workplaces, schools and hospitals
- 13 Tesla Supercharger locations with more coming



* Source PlugShare. January 7, 2014

CA Policies Driving the PEV Market

- ZEV Regulation
 - Requires 15.4% of annual new car sales to be ZEVs by 2025
- ZEV Executive Order
 - Calls for 1.5 million ZEVs by 2025
- ZEV Action Plan
 - Actions that state agencies can take to meet the ZEV EO
- 8 State MOU
 - Calls for 3.3 million ZEVs in the 8 MOU states by 2025
 - Released Multi-State ZEV Action Plan in May

PEV Incentives

- Federal tax credits
 - Up to \$7,500 for BEVs and PHEVs – amount depends on battery size
- California Clean Vehicle Rebate Project
 - Allocated almost \$133 million since 2010
 - Additional funding in the state budget for fiscal year 2014/15
- Hybrid and Zero-Emission Truck and Bus Voucher Incentive Program
 - Allocated over \$50 million since 2010
 - Additional funding in the state budget for fiscal year 2014/15
- Carpool / HOV stickers
- Local incentives
 - For example: free parking, additional vehicle rebate



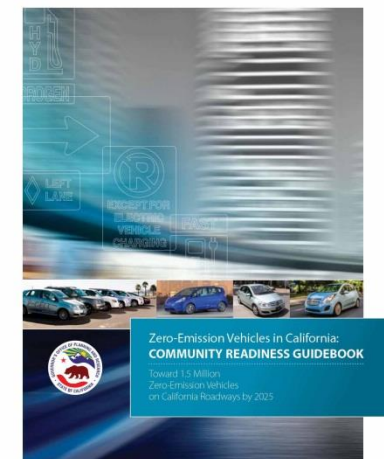
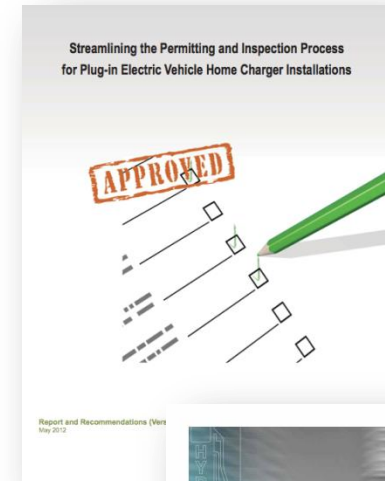
Tools for Workplace and MuD Charging

- Workplace Charging
 - Case Studies
 - Employee Survey
 - Communication Guides
 - CALSTART Best Practices
 - PEVCollaborative.org/workplace-charging
- Charging at Multi-unit Dwellings
 - Guidelines Document
 - Resident Survey
 - Communication Guides



PEV Readiness Tools for Local Government

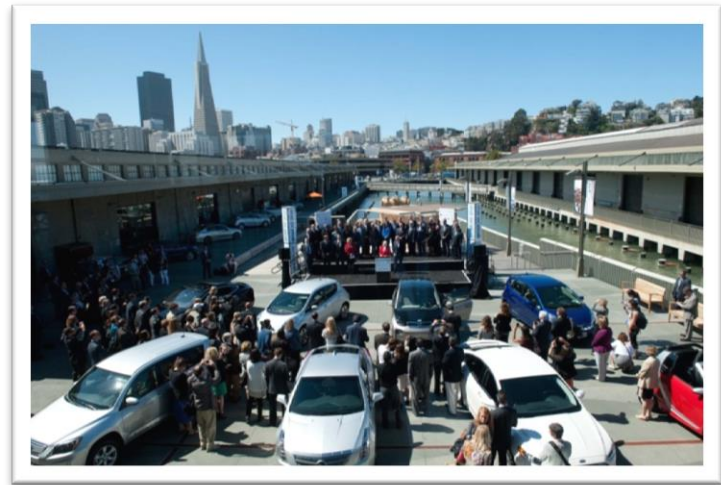
- PEVC PEV Readiness Toolkit
 - www.pevcollaborative.org/policy-makers
- Governor's Office ZEV Guidebook
 - www.opr.ca.gov/s_zero-emissionvehicles.php





DRIVE THE DREAM

- 50 corporate executives met with the Governor including:
 - Google, Coca-Cola, Walgreens
- Corporate commitments to Workplace Charging
- 2014 **DRIVE THE DREAM** follow up to continue momentum and engage corporate leaders





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WHO WE ARE OUR FOCUS MEMBERSHIP NEWS & EVENTS RESOURCES

From Awareness to Paradigms:
GM's Thoughts on PEVs at Three Years Old

Read More

PEV Sales Dashboard

March 5, 2014

NATIONAL SALES:

PEVs sold in 2014: 7,045
Cum. 2011 - 2014: 181,087

*numbers are approximate

CALIFORNIA SALES:

Cum. 2011 - 2014: 64,649
(approx. 33% of national sales)

Latest News & Events

PEVC Member Meeting

San Diego
Tuesday, March 11, 2014
Hosted by: San Diego Gas & Electric

February 26, 2014

February 20, 2014

RFP for Distribution of PEV 2013 Working Group Documents

The Collaborative is accepting proposals for a contractor to help with the possible distribution in California 2013 documents. Proposals are due 5:00 p.m. on Thursday, March 13, 2014.

Download RFP

DriveClean.ca.gov

Plug-in Electric Vehicle Resource Center

IN PARTNERSHIP WITH CALIFORNIA PLUG-IN ELECTRIC VEHICLE COLLABORATIVE

PEVs & The Environment How PEVs Benefit You Learn More

Like 10 Share 3 Print

Search & Explore

- Plug-in Vehicles
- Charging
- Incentives
- Costs
- Safety

View Resources For:

- Dealers
- Fleets
- Businesses
- Electricians
- First Responders
- Cities
- Policy Makers
- Media

PEV Buying Guide

Welcome to California's buying guide and resource center for plug-in electric vehicles (PEVs). We'll help you compare your options and take the next steps into PEV ownership.

Get Started >>

Find a PEV

Technology: [Dropdown]
Year: [Dropdown]
Make: [Dropdown]
Model: [Dropdown]

SEARCH

Checklist

PEV Buyers How to prepare for your PEV purchase.

PEV Owners Steps to getting your decals, rebates, and other PEV perks.

Stories on the Street

Kia's new Soul EV is coming this fall. Check out their new ad:

[2015 Soul EV] "Recharge"

Answers to Your Questions

Q. Why should I drive electric?
A. Plug-in electric cars deliver all

True or Not?

MYTH: Plug-in vehicles don't have enough range.

www.DriveClean.ca.gov/pev