

# Clean Vehicle Rebate Project Update

San Diego ReFuel Coordinating Council Meeting

15 July 2015, San Diego CA

Brett Williams, PhD – Senior Project Manager, EV Initiatives

John Anderson – Project Associate & CVRP Transparency Specialist

Additional thanks to Colin Santulli and others at CSE



# CSE Electric Vehicle (EV) Activities



Incentives Design & Administration



Consumer & Dealer Outreach



Stakeholder Engagement



Fleet Assistance & Clean Cities



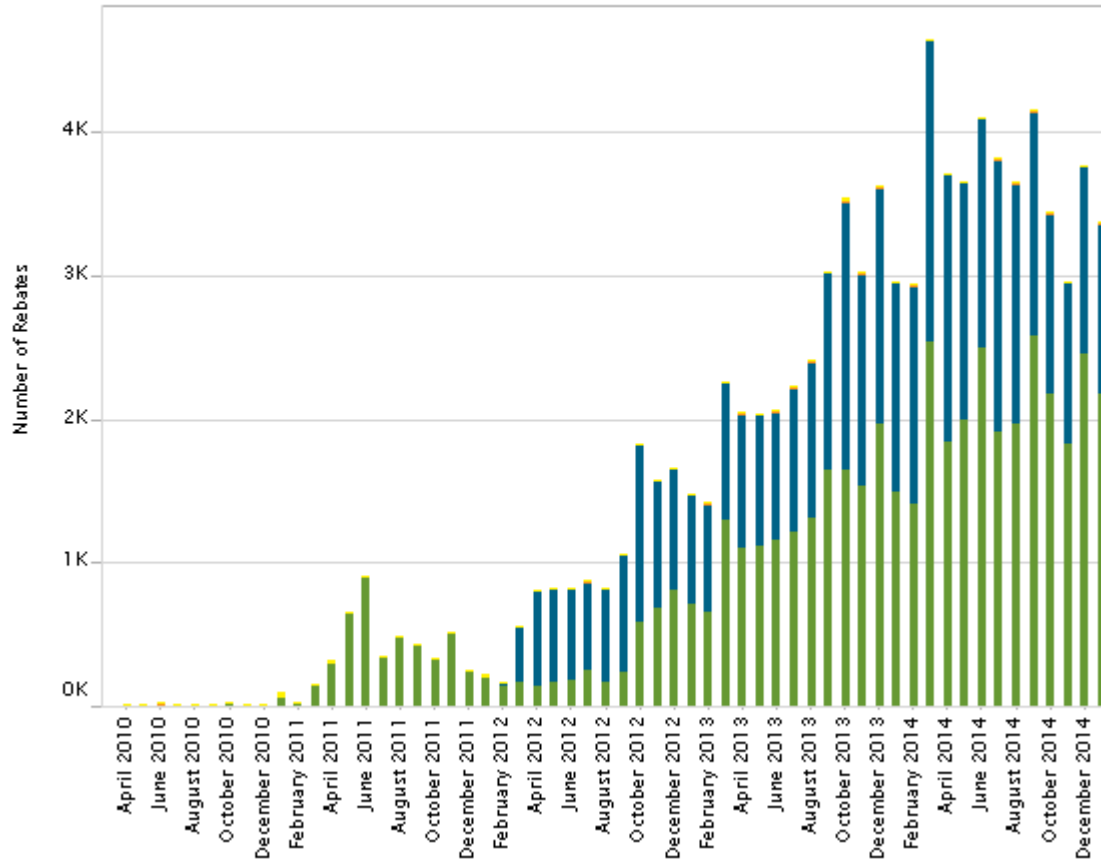
PEV, Alt.-Fuel, & ZEV Planning & Implementation



2<sup>nd</sup> Life Battery Research & Vehicle-Grid Integration

# Vehicle Incentives

**CVRP Rebates by Month**



**Vehicle Category**

- BEV
- PHEV
- FCEV
- Other

BEV	Highway capable, four-wheeled, all-battery electric vehicle
PHEV	Plug-in hybrid electric vehicle (powered by electricity and gasoline)
FCEV	Fuel-cell electric vehicle
Other	Non-highway, motorcycle, and commercial BEVs

CSE has processed  
more than:  
**112,000 vehicle rebates,**  
**\$238 million in incentives**



**San Diego  
Airport  
Vehicle Rebate  
Program**

CLEAN VEHICLE  
REBATE PROJECT<sup>SM</sup>

**MOR-EV**  
Massachusetts Offers Rebates  
for Electric Vehicles






**CHEAPR**  
Connecticut Hydrogen and Electric Automobile Purchase Rebate



# Outline

- **Clean Vehicle Rebate Project (CVRP) Overview**
  - Program Changes
- **Public Fleet Pilot Project (PFPP)**
- **Public Tools and Available Data**
  - Rebate Statistics
  - EV Survey Data
- **California & San Diego EV Market Trends**
  - Registrations/Rebates
  - CVRP Uptake Rate
  - Charging Stations

# Statewide Monetary Incentives

		CVRP	Federal Tax Credit
	<b>Hydrogen Fuel-Cell Electric Vehicles</b>	\$5,000	<i>Expired</i>
	<b>Battery Electric Vehicles (&amp; i3 REx)</b>	\$2,500	\$7,500
	<b>Plug-in Hybrid Electric Vehicles</b>	\$1,500	Up to \$7,500
	<b>Neighborhood Electric Vehicles</b>	\$900	
	<b>Zero-Emission Motorcycles</b>	\$900	

## New Since July 2014

- Electronic document submission option
  - Upload via the CVRP webpage
    - Mail or email also acceptable
  - Shortens the length of the application process
- Ownership requirement now 30 months
  - (down from 36 months)

# FY 2015–2016 CVRP Updates

- \$163 million additional funding
- To take effect in 4–6 months:
  - Income cap for higher-income consumers
  - Increased rebate amounts for low- and moderate-income (LMI) consumers

<http://arb.ca.gov/lispub/rss/displaypost.php?pno=8634>



# Income Cap

- 4–6 month warm-up period before takes effect
- Cap level based on income tax filing status:
  - \$250,000 for single filers
  - \$340,000 for head-of-household filers
  - \$500,000 for joint filers
- Cap for fuel-cell electric vehicles (FCEV) deferred








# Increased Rebate Amounts for LMI Consumers

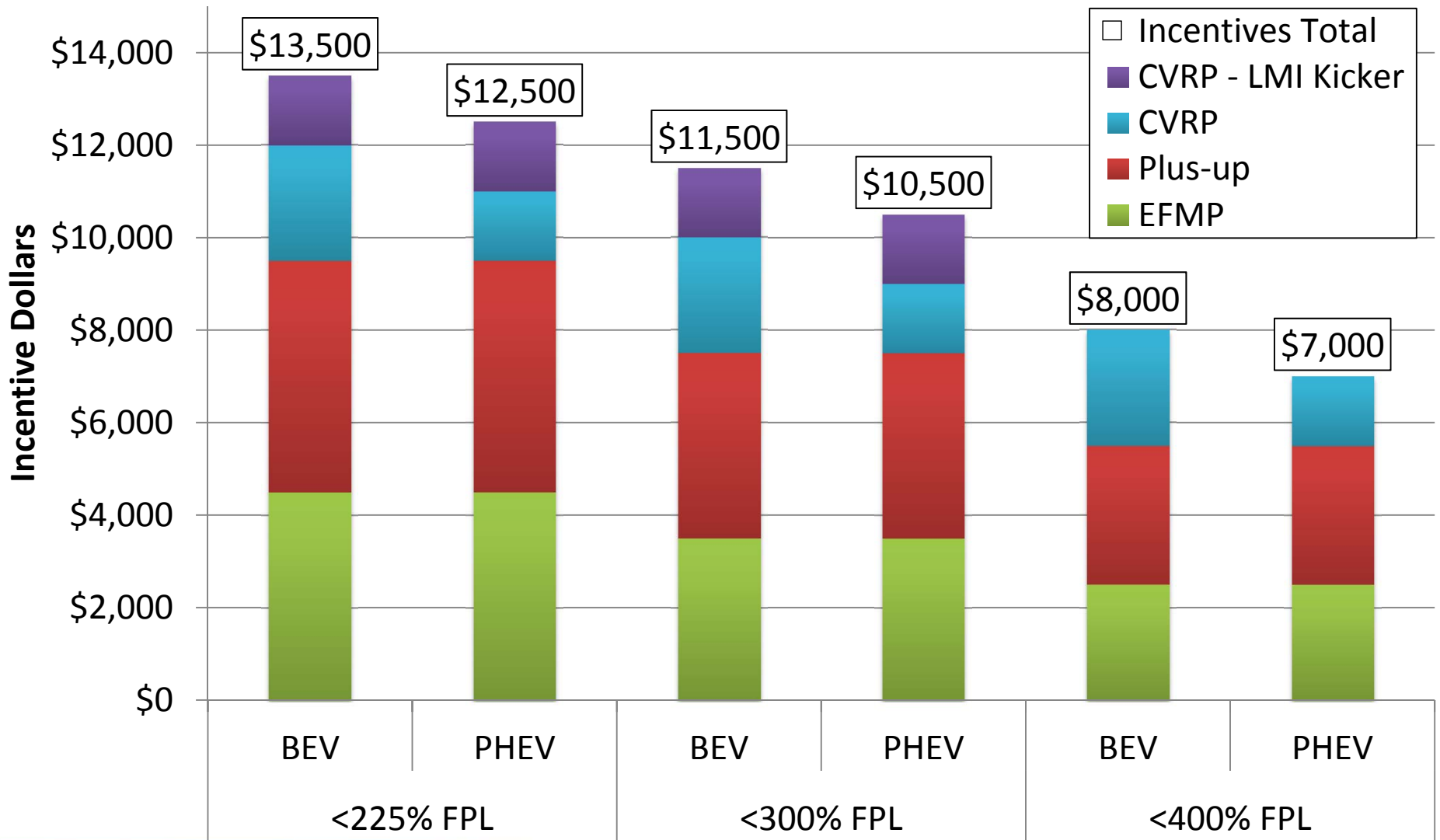
- 4–6 month warm-up period before increased rebate amounts take effect
- Available to consumers with household incomes  $\leq$  300% of the federal poverty level (FPL)

Persons in household	Max. income
1	\$35,310
2	\$47,790
3	\$60,270
4	\$72,750
5	\$85,230
6	\$97,710
7	\$110,190
8	\$122,670

# Statewide Monetary Incentives

		CVRP	CVRP-LMI (≤300% FPL)
	<b>Hydrogen Fuel-Cell Electric Vehicles</b>	\$5,000	\$6,500
	<b>Battery Electric Vehicles (&amp; i3 REx)</b>	\$2,500	\$4,000
	<b>Plug-in Hybrid Electric Vehicles</b>	\$1,500	\$3,000
	<b>Neighborhood Electric Vehicles</b>	\$900	\$900
	<b>Zero-Emission Motorcycles</b>	\$900	\$900

# Incentive Summary: South Coast and San Joaquin



# Public Fleet Pilot Project

## Increased Incentives for Public Fleets in Disadvantaged Communities

- \$5M allocated for FY2015–2016
- New purchases only, no leases
- 30 rebates per calendar year
- Optional pre-delivery reservations
- Can be combined with other incentives, but not CVRP



**FCEV**

**\$15,000**



**BEV**

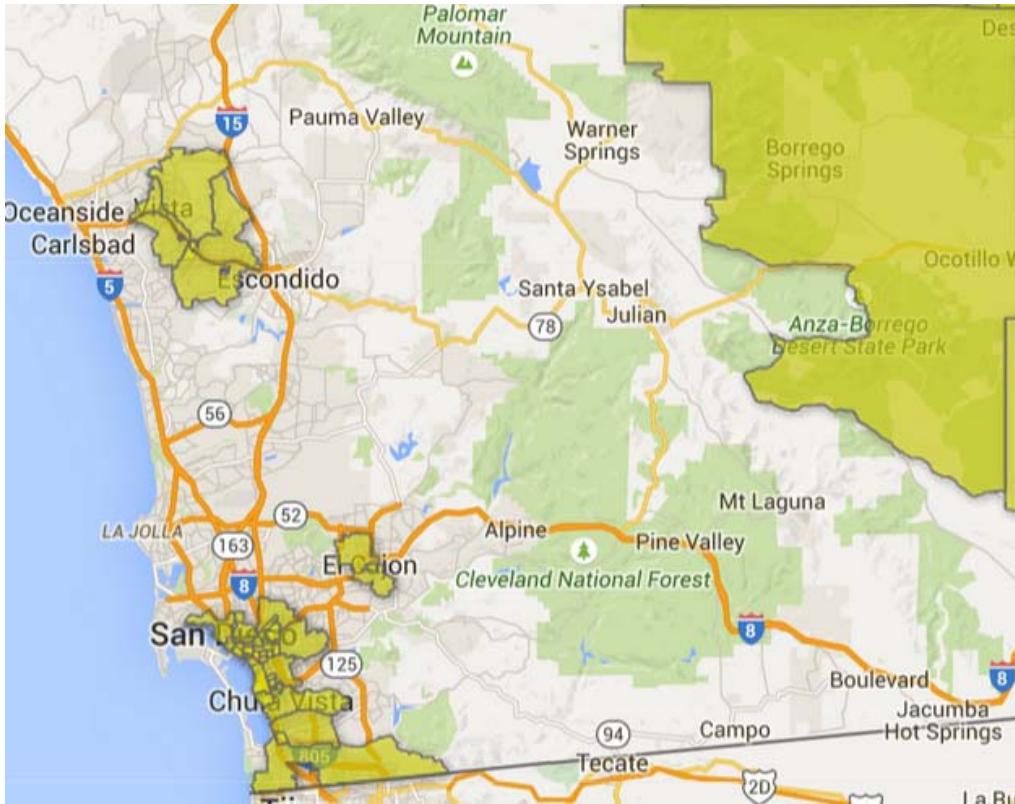
**\$10,000**



**PHEV**

**\$5,250**

# Public Fleet Pilot Project - Eligibility



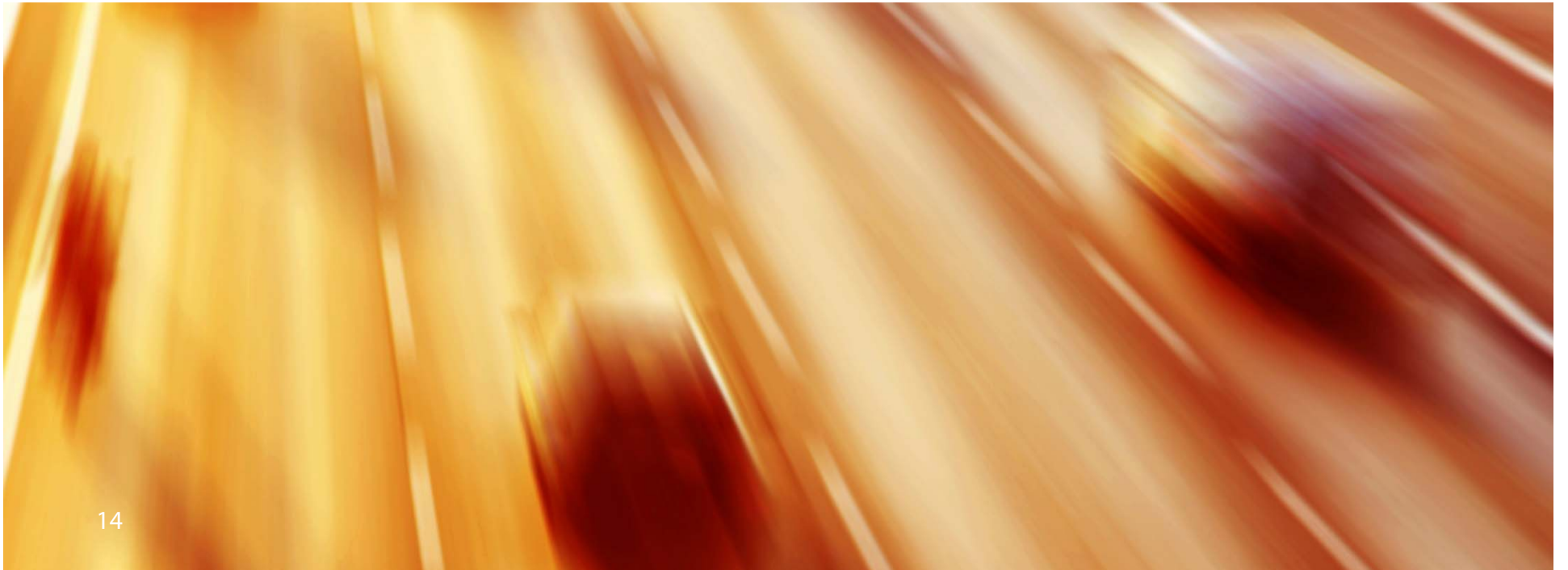
- Local and state public entities in disadvantaged communities
- Determined by ZIP code of vehicle domicile facility
- Eligibility verification at: [energycenter.org/PFP](http://energycenter.org/PFP)

<http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/535zipmap.htm>





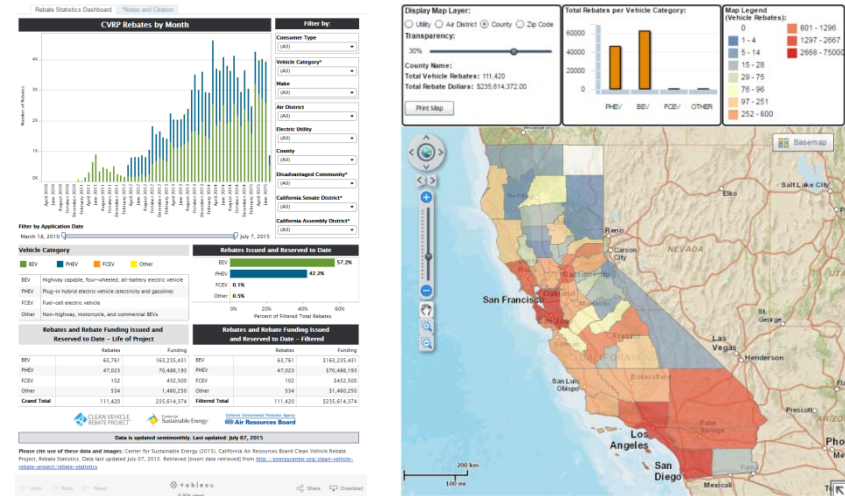
# Data and Tools



# CVRP Transparency Tools

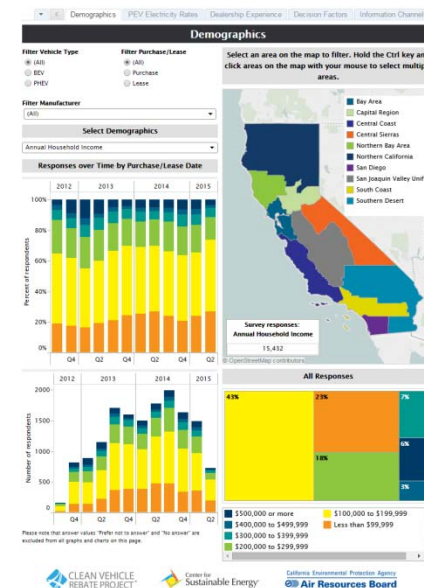
## Rebate Statistics Dashboard and Map

- CVRP application data
- Updated twice per month



## EV Consumer Survey Dashboard

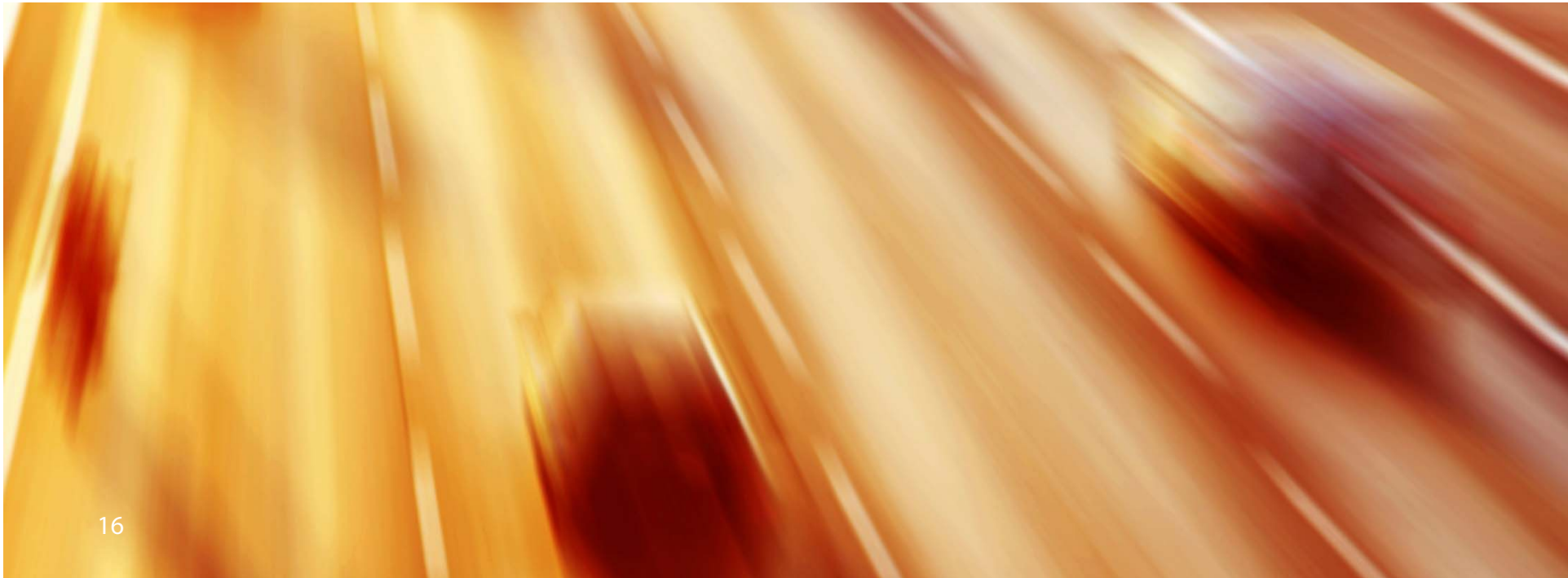
- EV Consumer Survey data
- Covers vehicles purchased or leased from September 2012 – May 2015



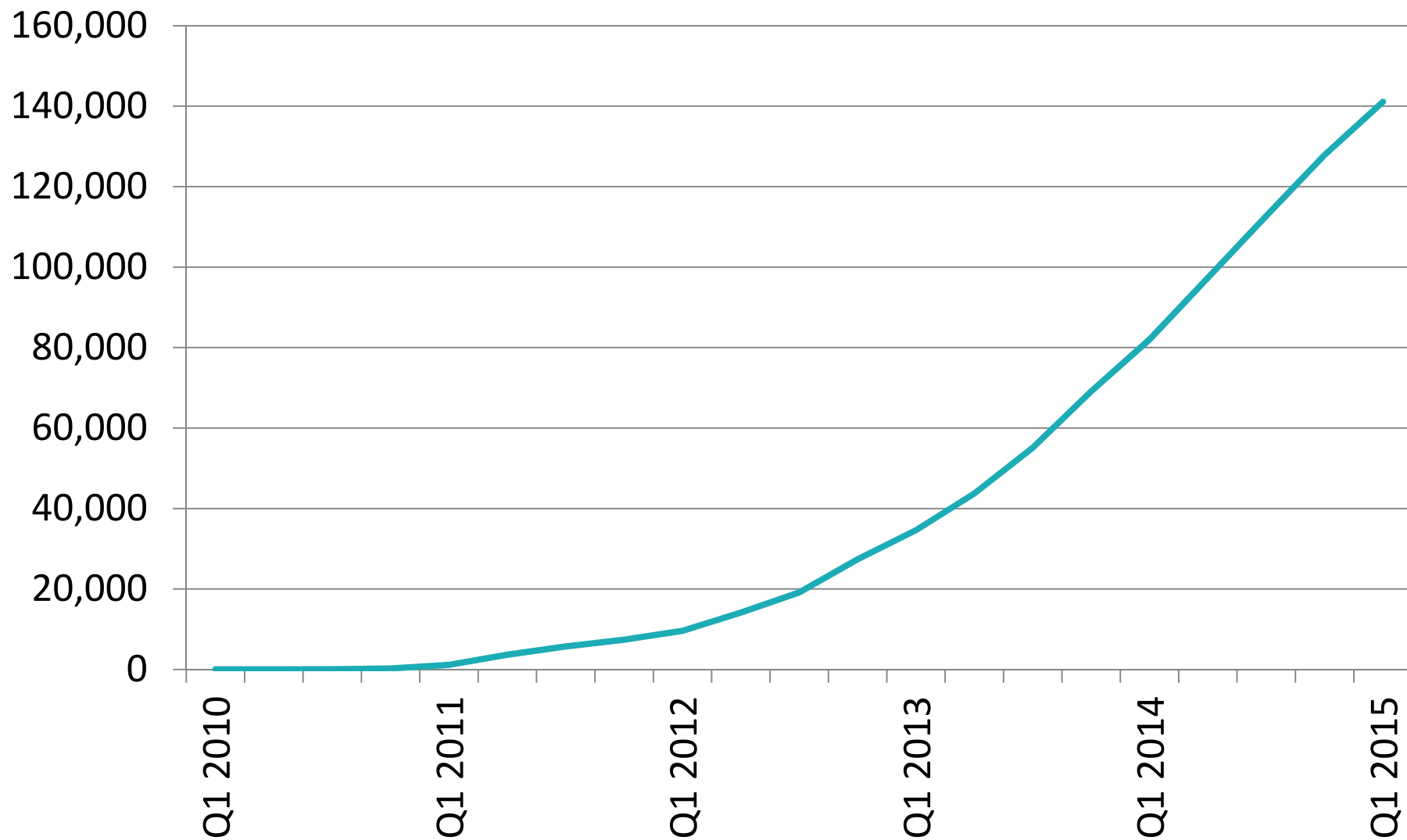




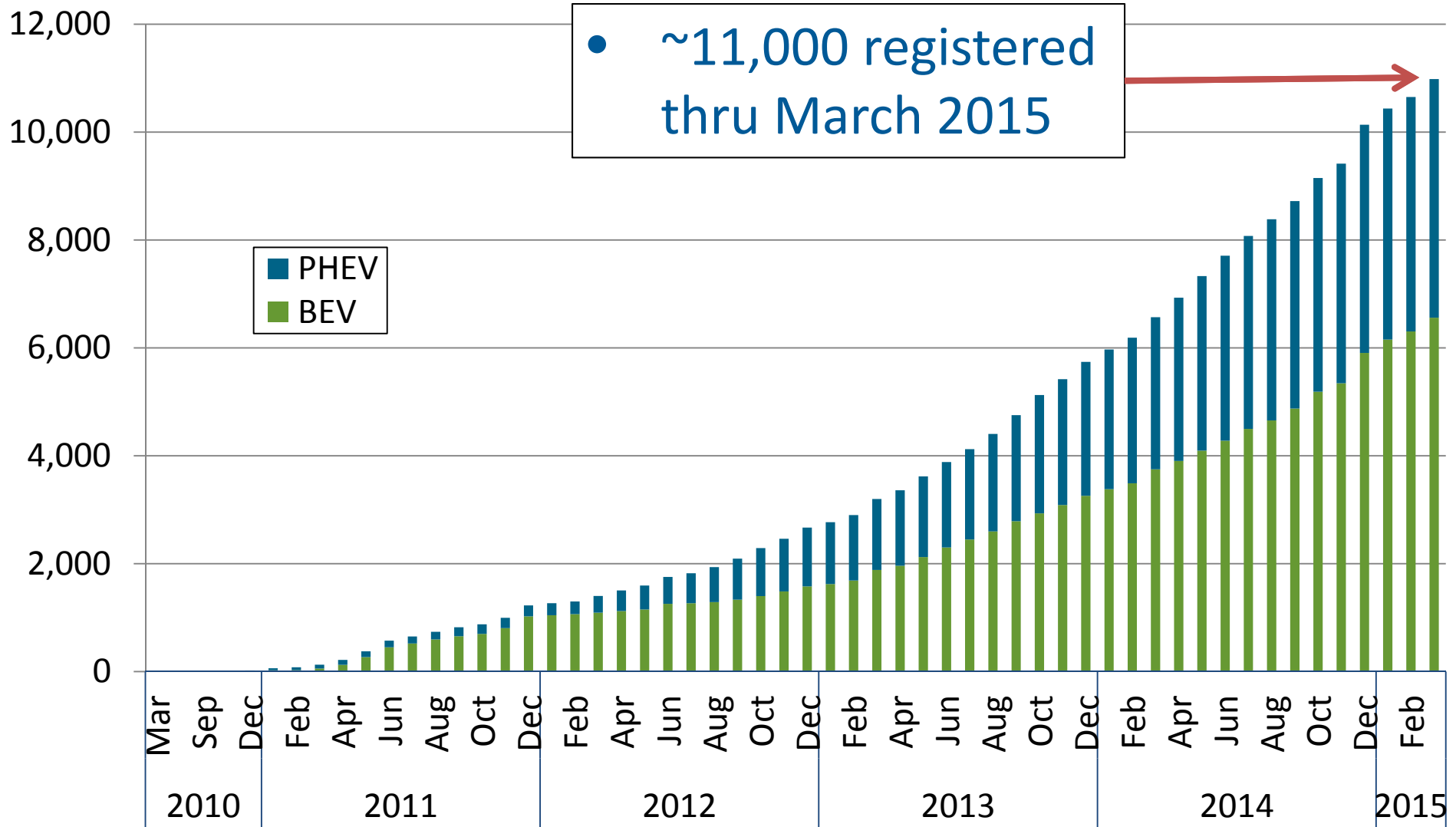
# CA & San Diego EV Market & Rebate Trends



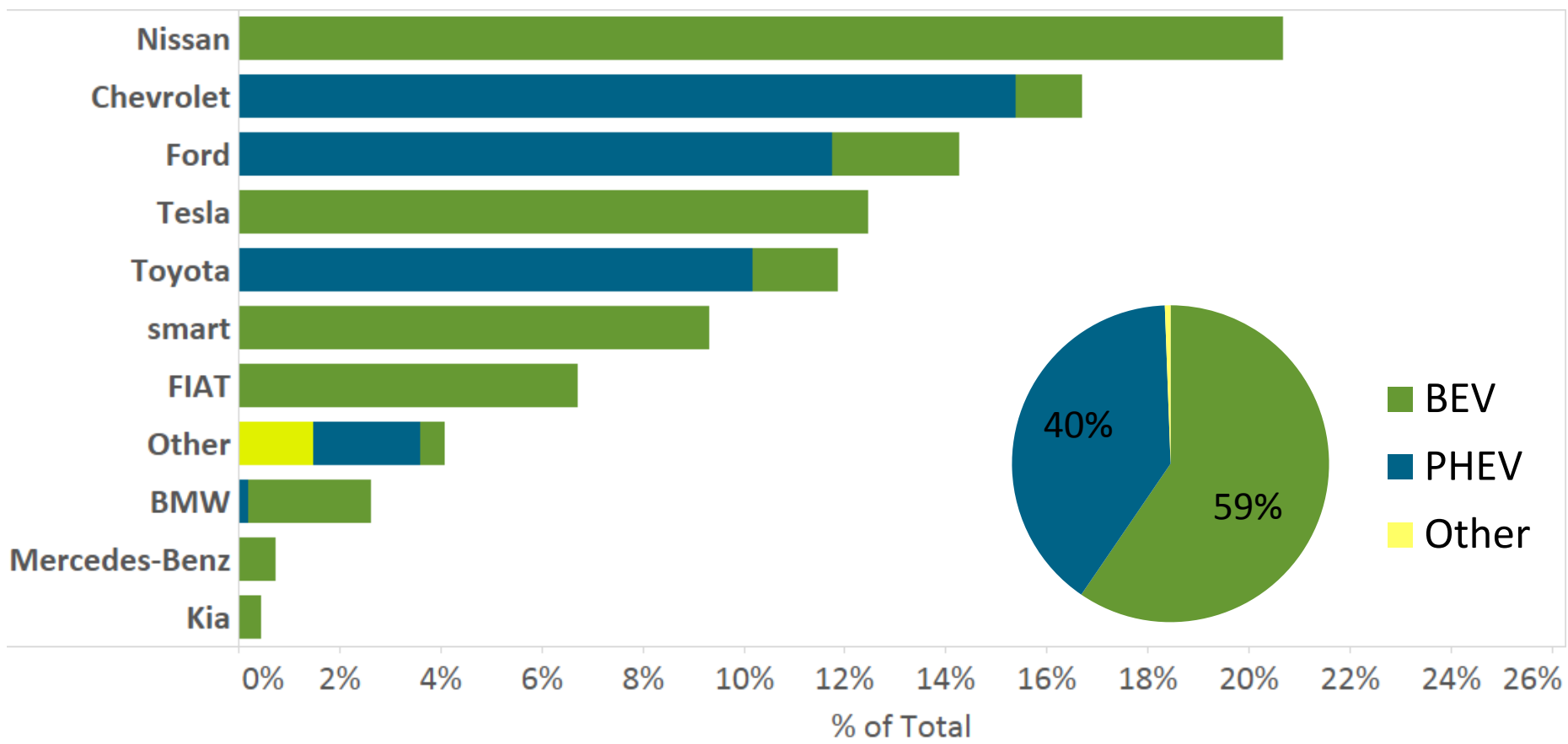
# California Cumulative PHEV, BEV, FCEV Sales (2010 – Q1 2015)



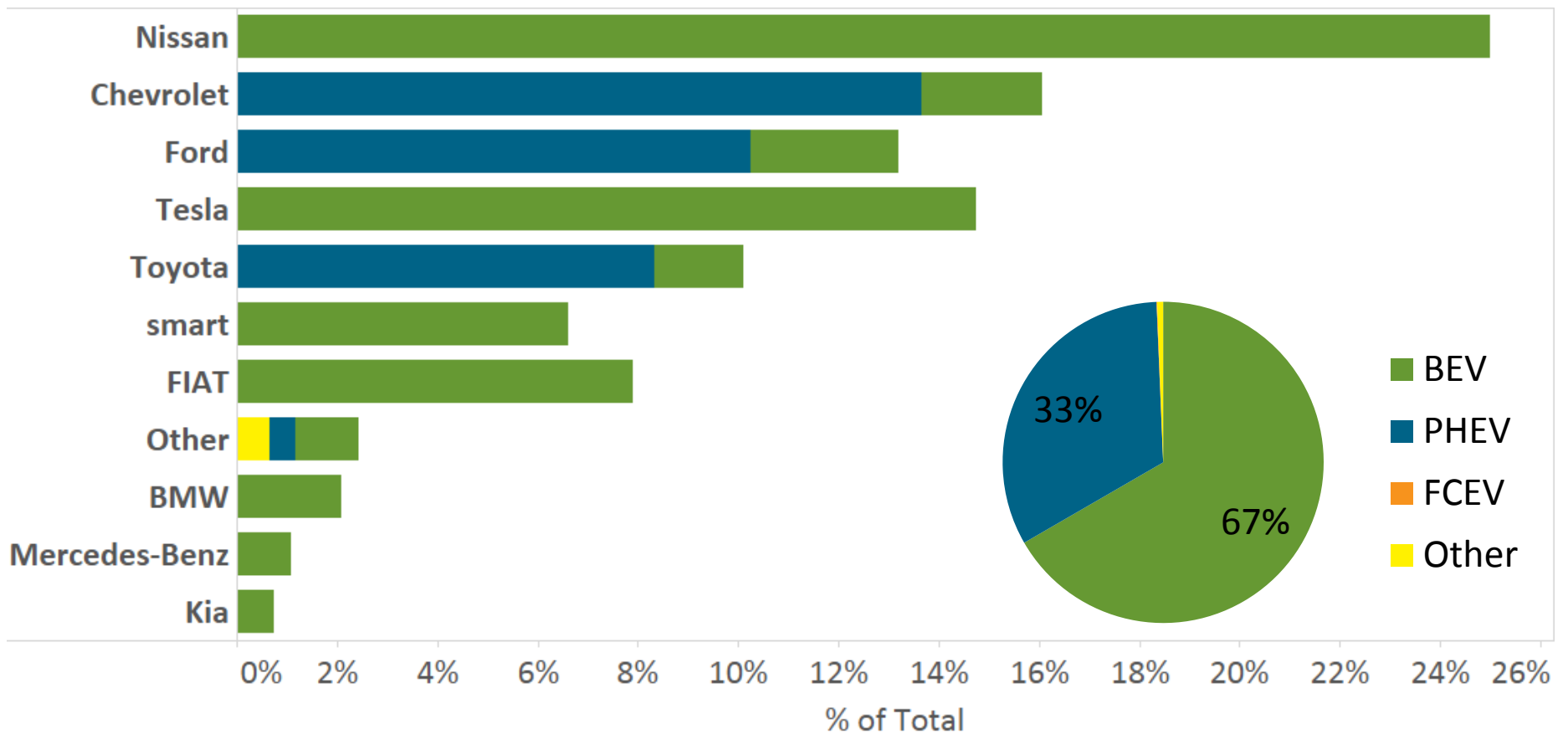
# San Diego EV Market: Cumulative Volume



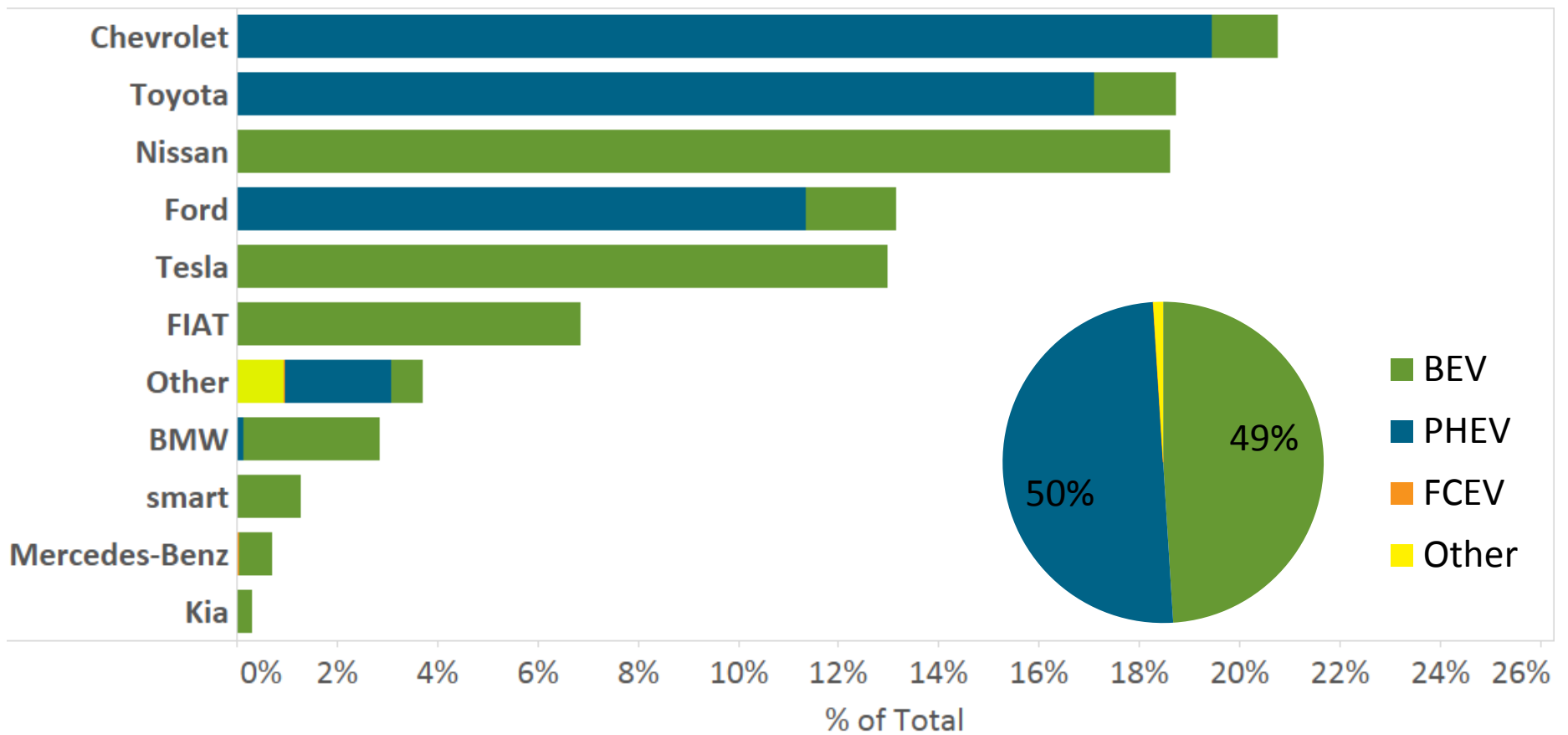
# San Diego EV Market: Vehicles



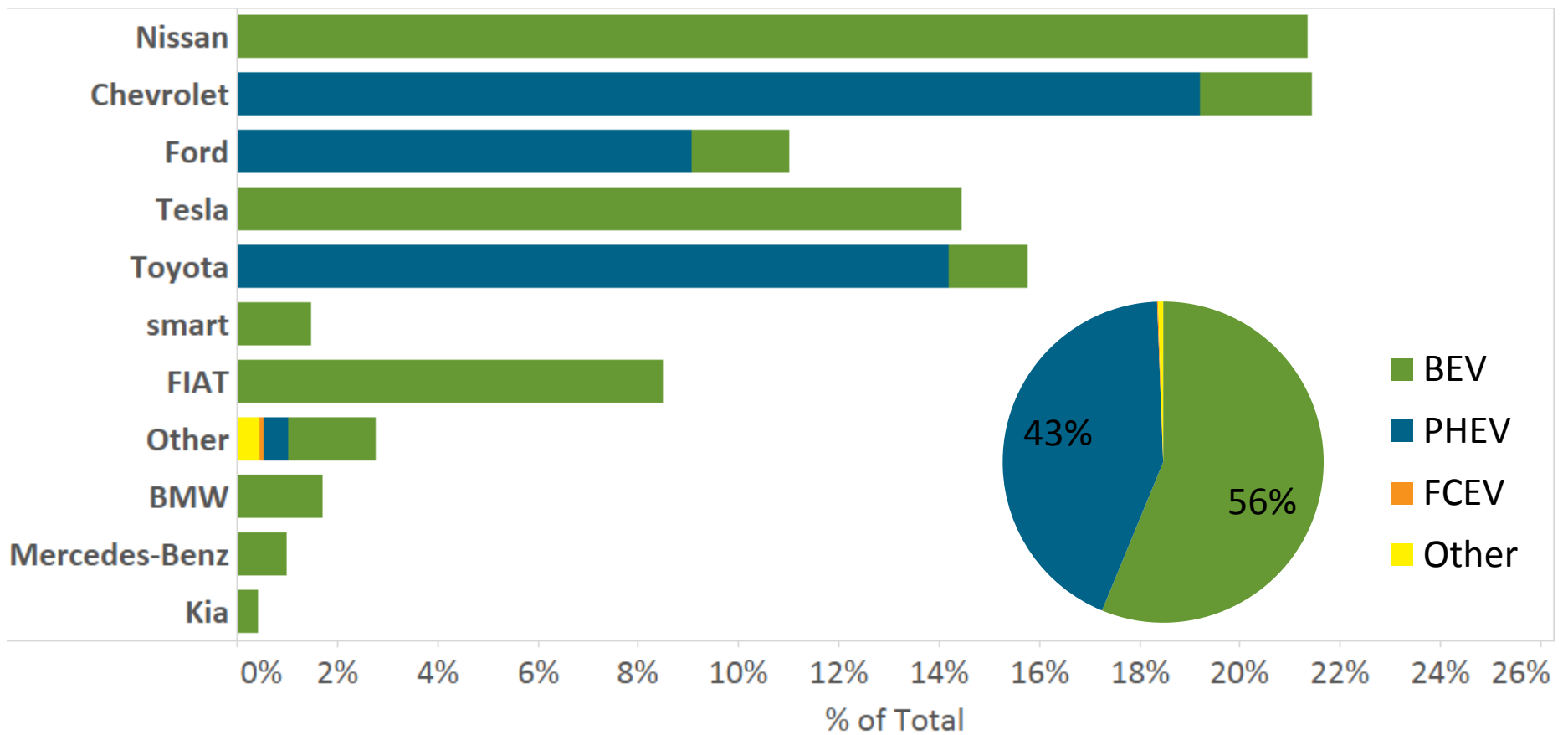
# San Diego EV Market: Rebates



# Rest of State: Vehicles

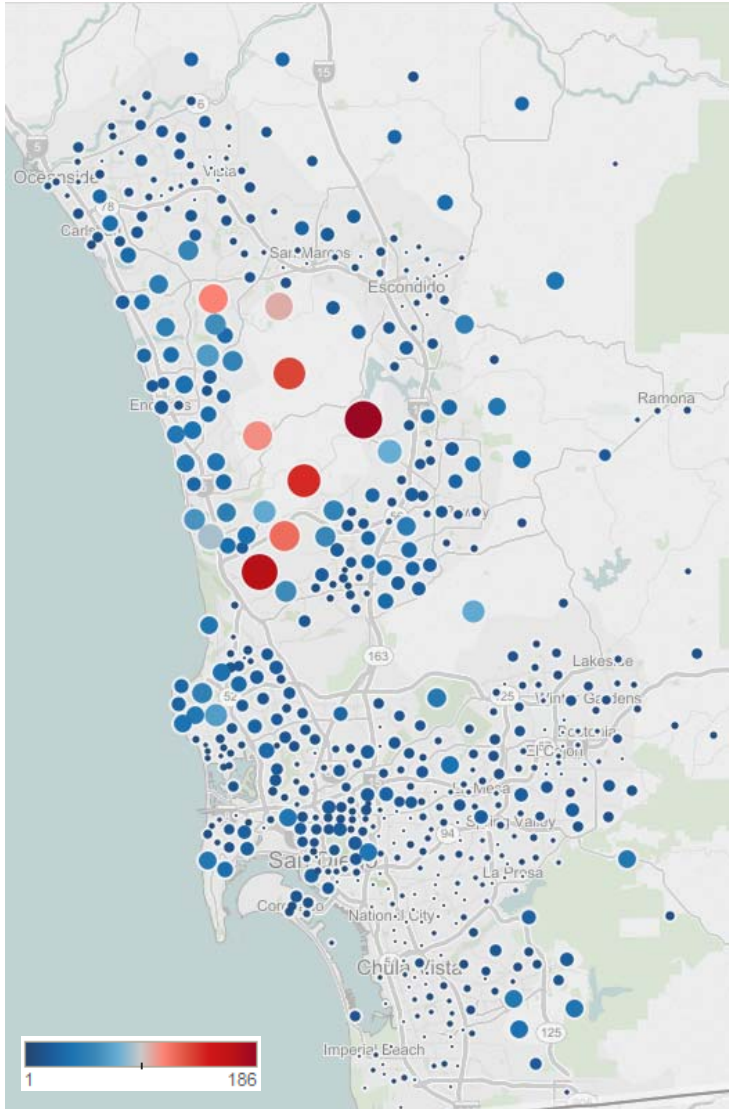


# Rest of State: Rebates

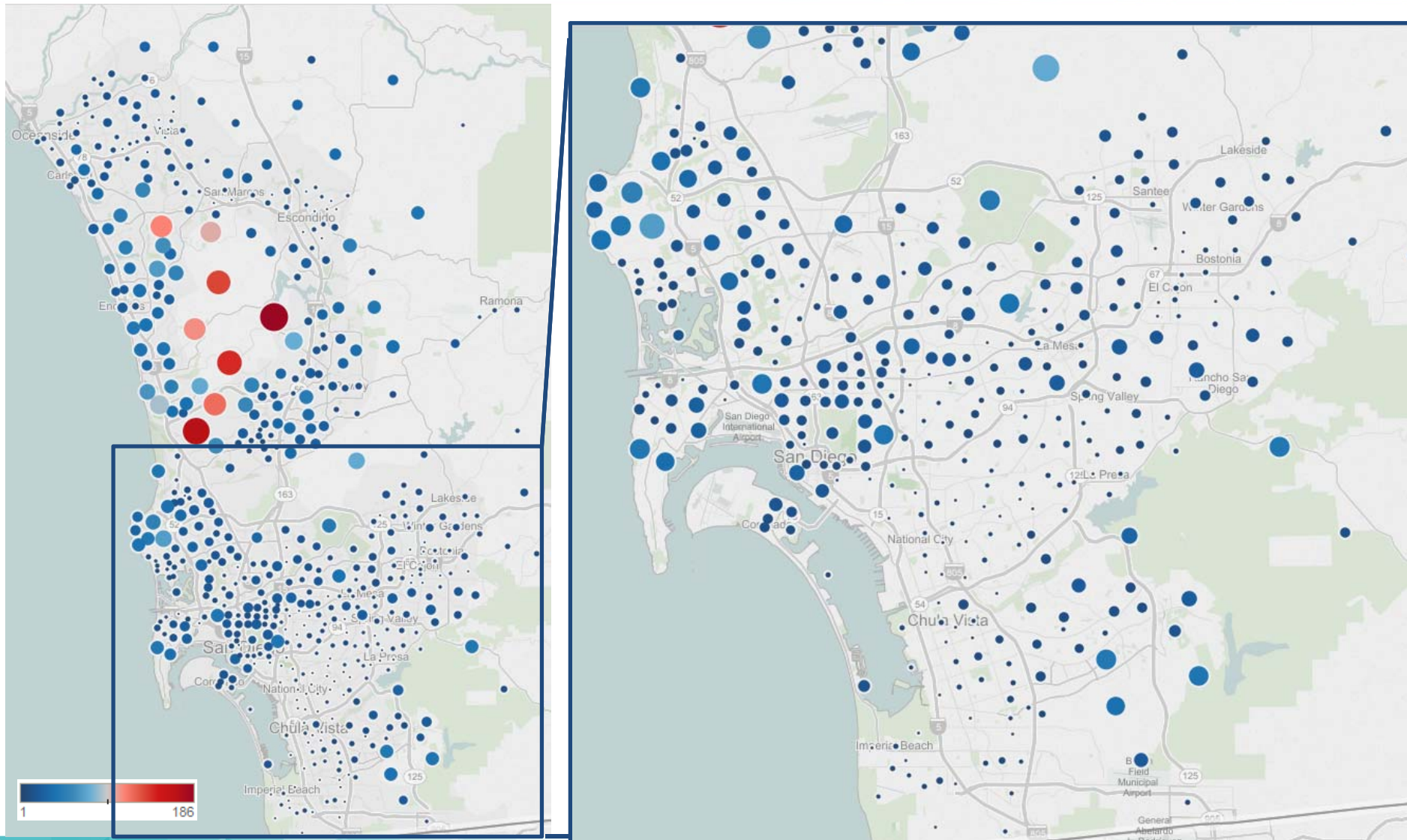




# San Diego County Rebates by Census Tract

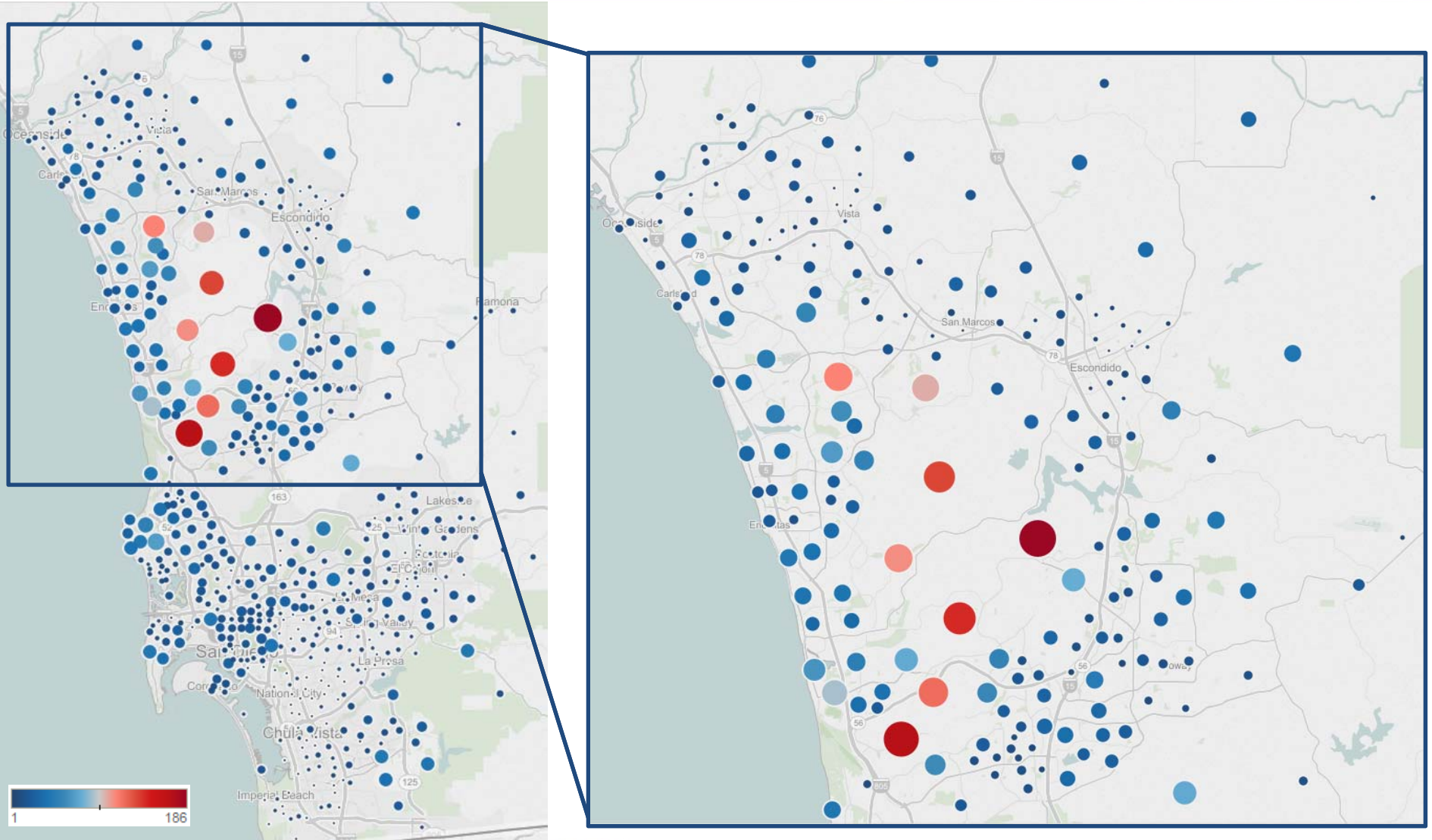


# San Diego County Rebates by Census Tract





# San Diego County Rebates by Census Tract



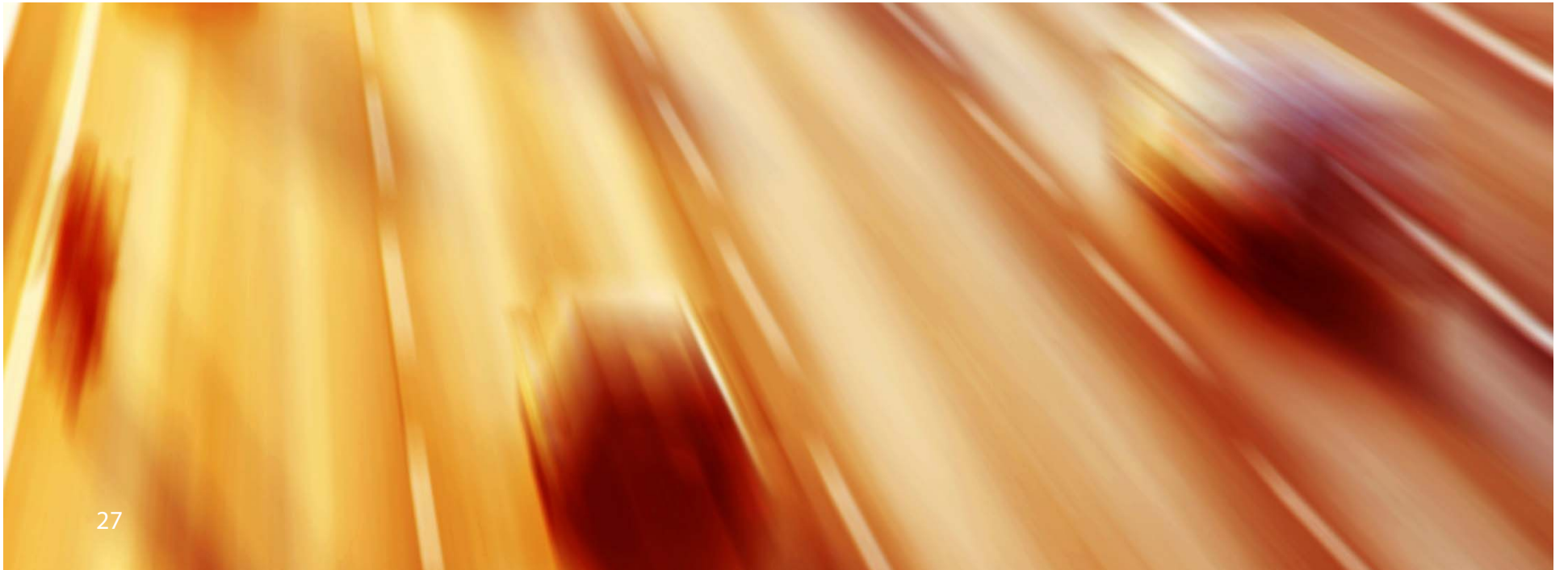
# Journey ahead?





# Did you get all that?

Any questions?





Center for  
Sustainable Energy™

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[john.anderson@energycenter.org](mailto:john.anderson@energycenter.org)





# National Drive Electric Week 2015



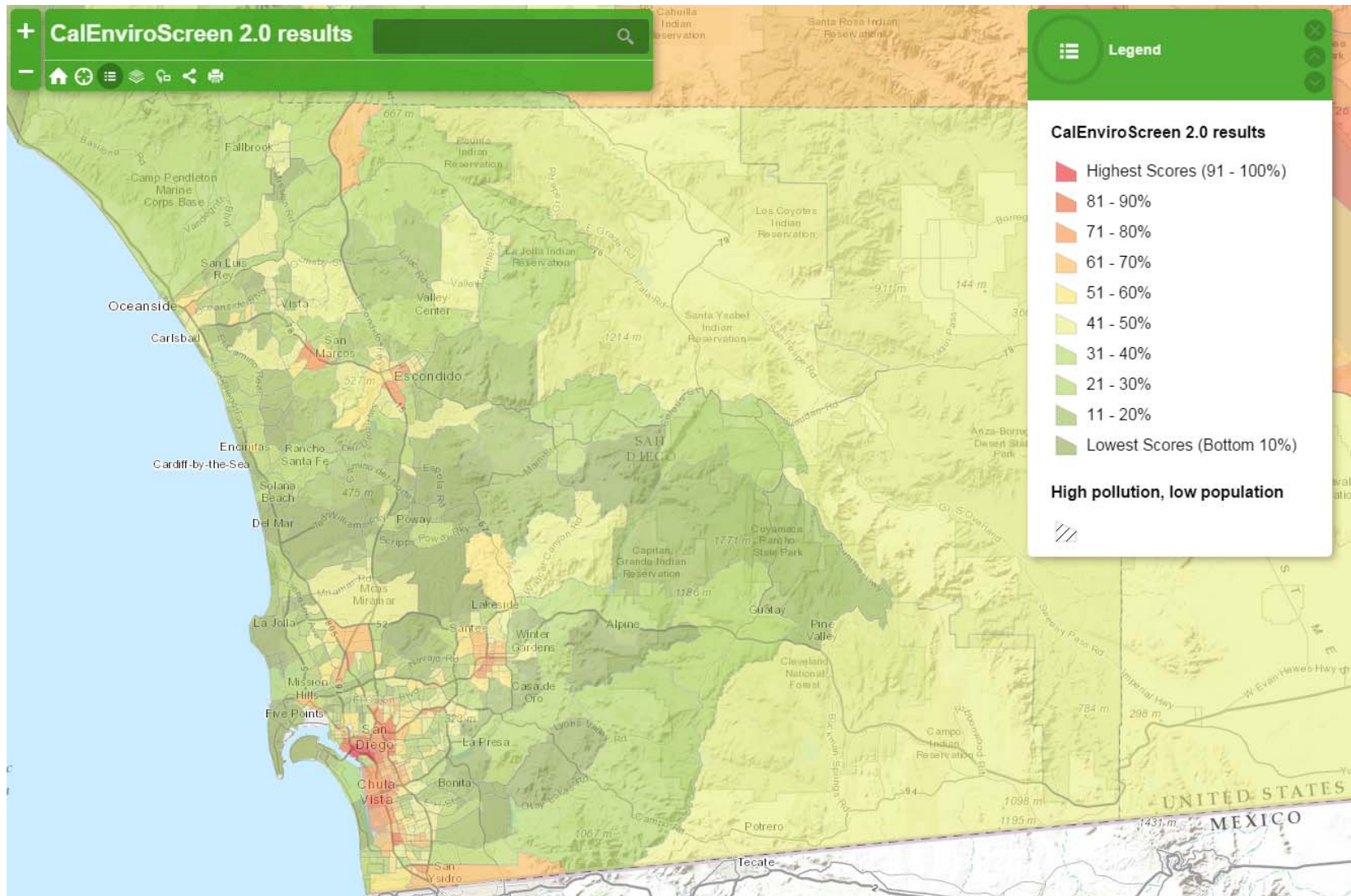


# National Drive Electric Week 2015

- Organized nationally by the Sierra Club
- Over 100 events last year, 150 expected 2015
- San Diego: Center for Sustainable Energy and San Diego Gas & Electric
- This year:

**Saturday, September 19, 10am**  
**Liberty Station**

# Disadvantaged Communities



# Monetary Incentives

CVRP or PFPP



**Hydrogen Fuel-Cell  
Electric Vehicles**

*\$5,000*

*\$15,000*



**Battery Electric  
Vehicles (& i3 REx)**

*\$2,500*

*\$10,000*



**Plug-in Hybrid  
Electric Vehicles**

*\$1,500*

*\$5,250*



**Neighborhood  
Electric Vehicles**

*\$900*

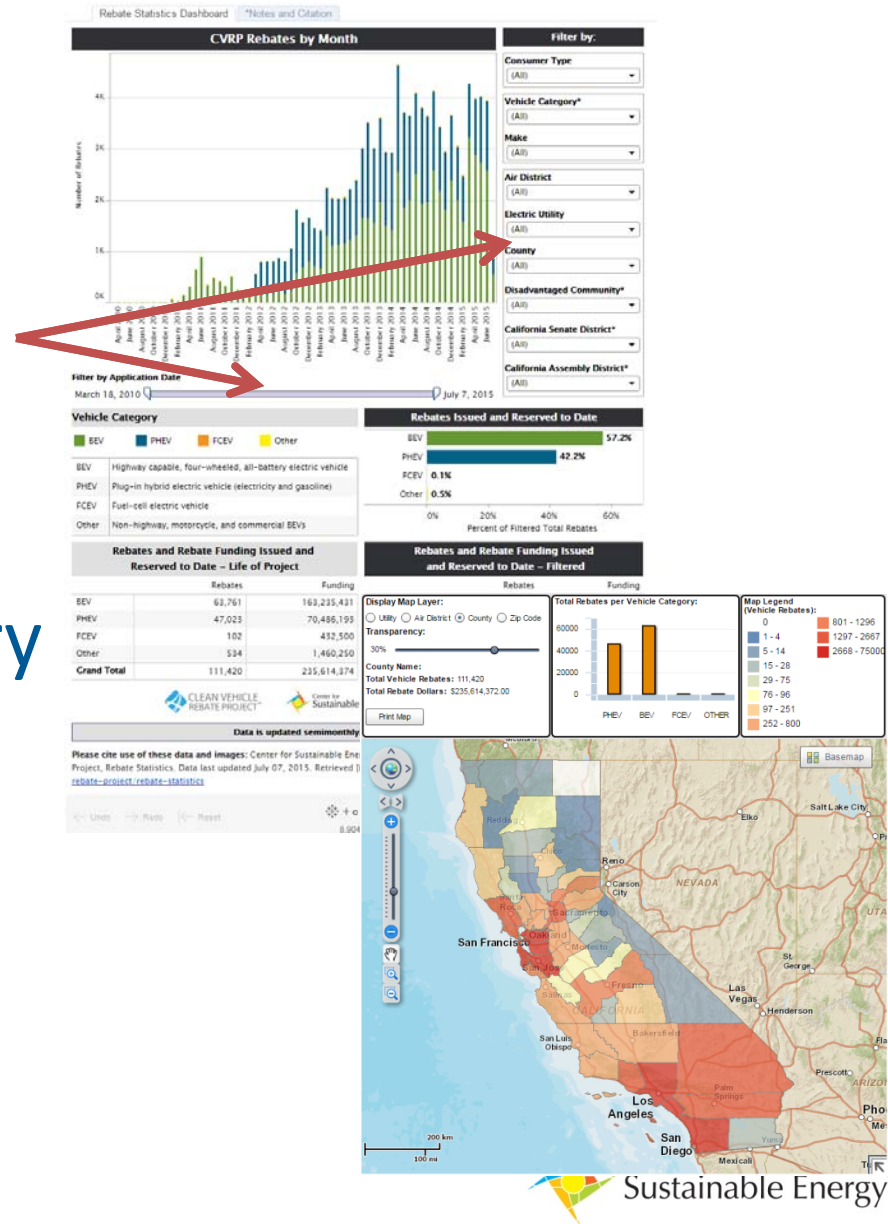


**Zero-Emission  
Motorcycles**

*\$900*

# Rebate Statistics

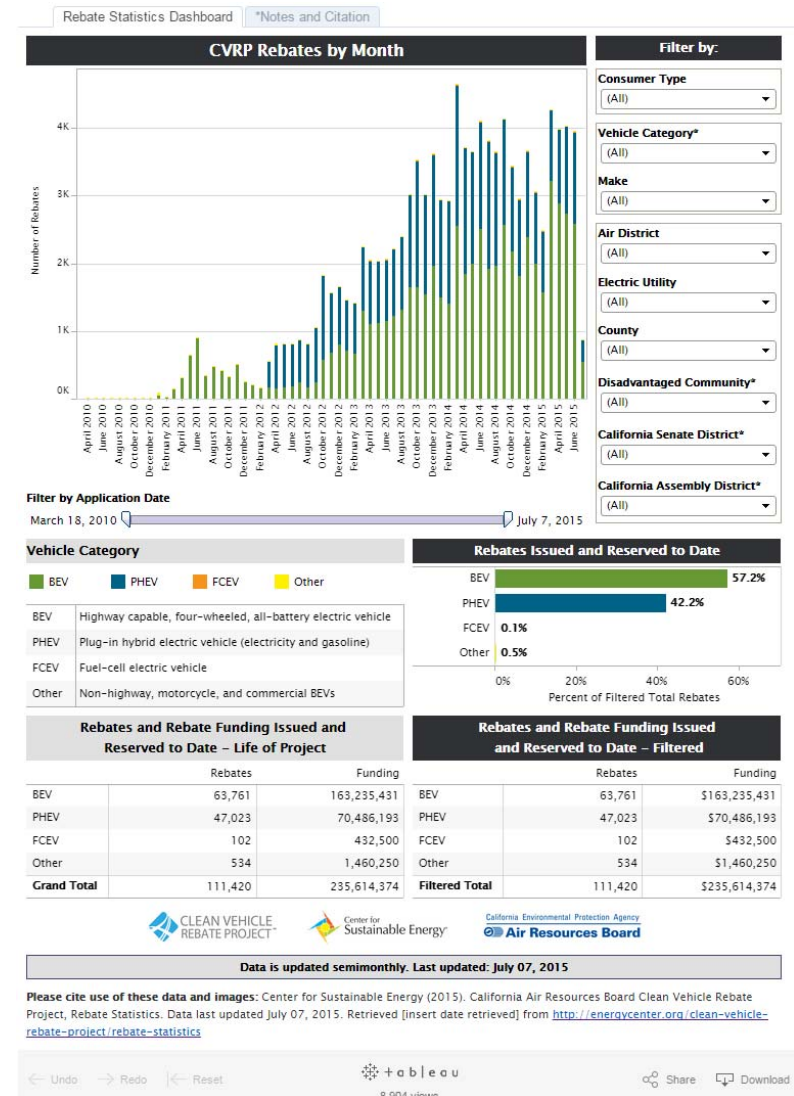
- CVRP Application Data
- Updated twice monthly
- Consumer, vehicle, and application date filters
- Results displayed over time, by vehicle category (Rebate Statistics Dashboard) and geographically (Rebate Map)



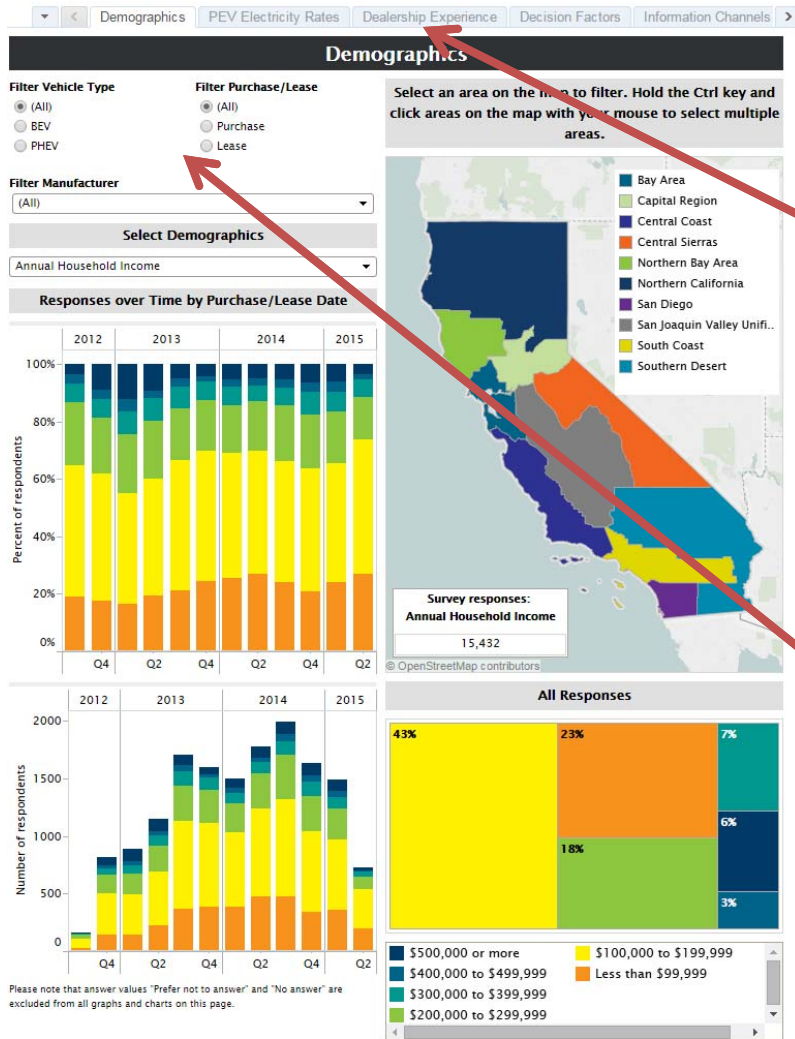


# Rebate Statistics Dashboard: New Features

- Filter by:
  - vehicle category
  - vehicle make
  - disadvantaged community status
  - California Senate District
  - California Assembly District
- BEV and FCEV broken out
- Compare filtered results with overall side-by-side
- Census tract, in addition to new filter data, available for download



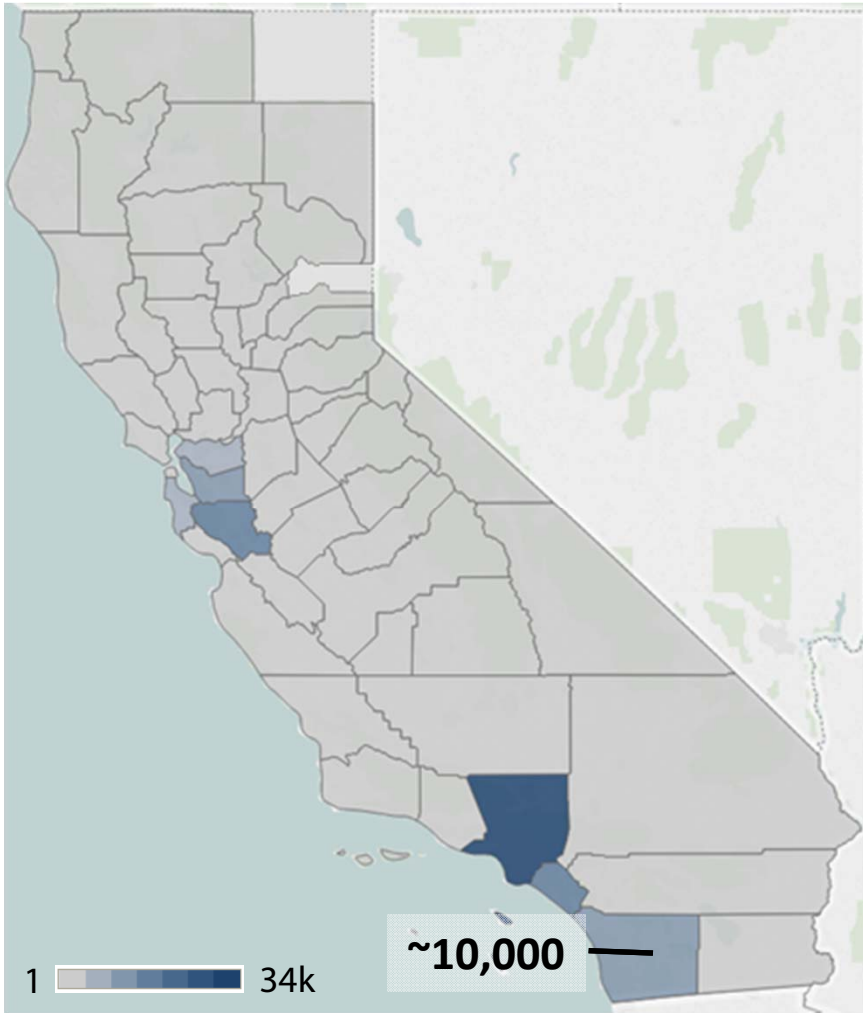
# Transparency: Consumer Survey Data



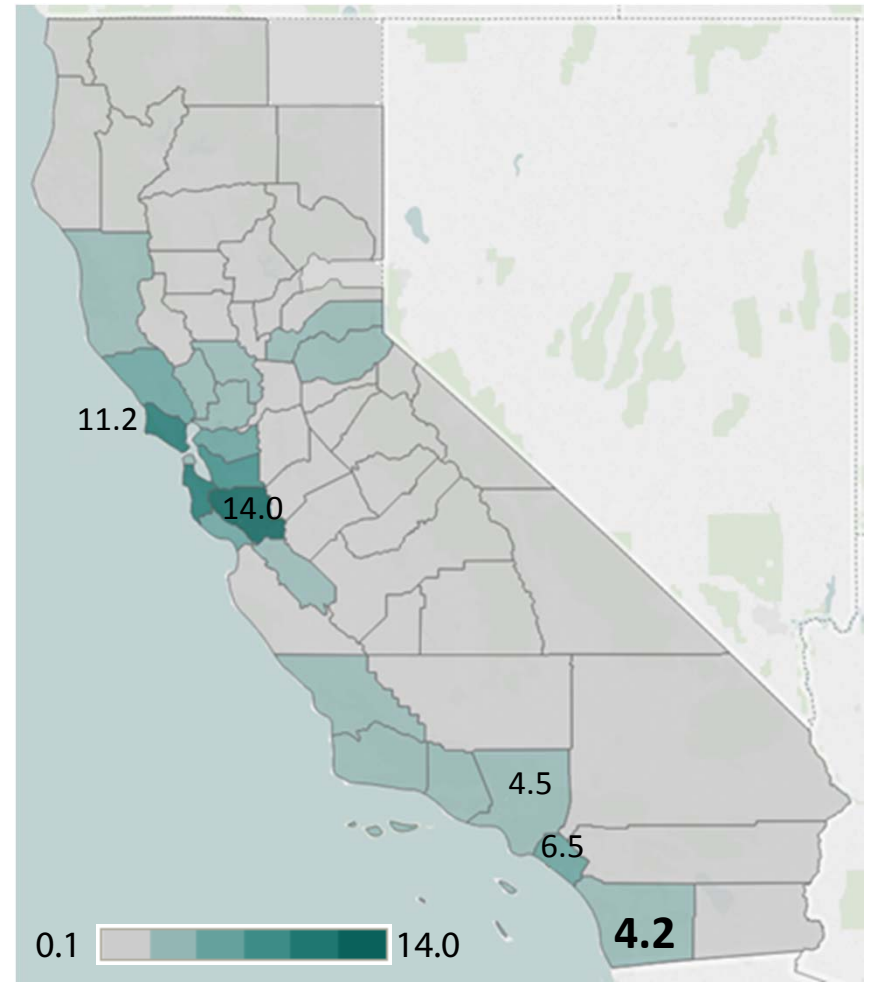
- All applicants invited to take a survey
- >16,000 CVRP responses
- Topics include:
  - purchase motivations and enablers
  - dealership experience,
  - utility rate awareness
  - Demographics
- Filter by vehicle category, tenure, make, geography
- CVRP responses updated monthly on an interactive dashboard for easy use
- Weighting (internal)

# Registrations and Density by County (2010 –2014)

## New ZEV Registrations



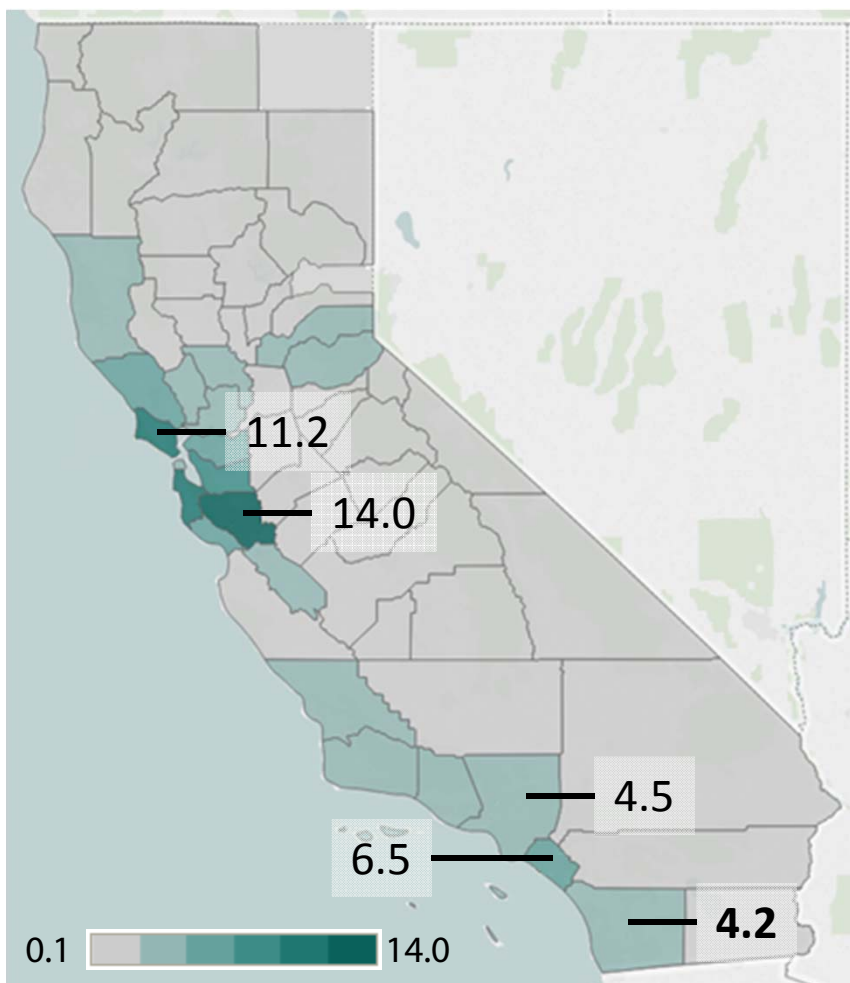
## New ZEV registrations per 1,000 population (18 or older)



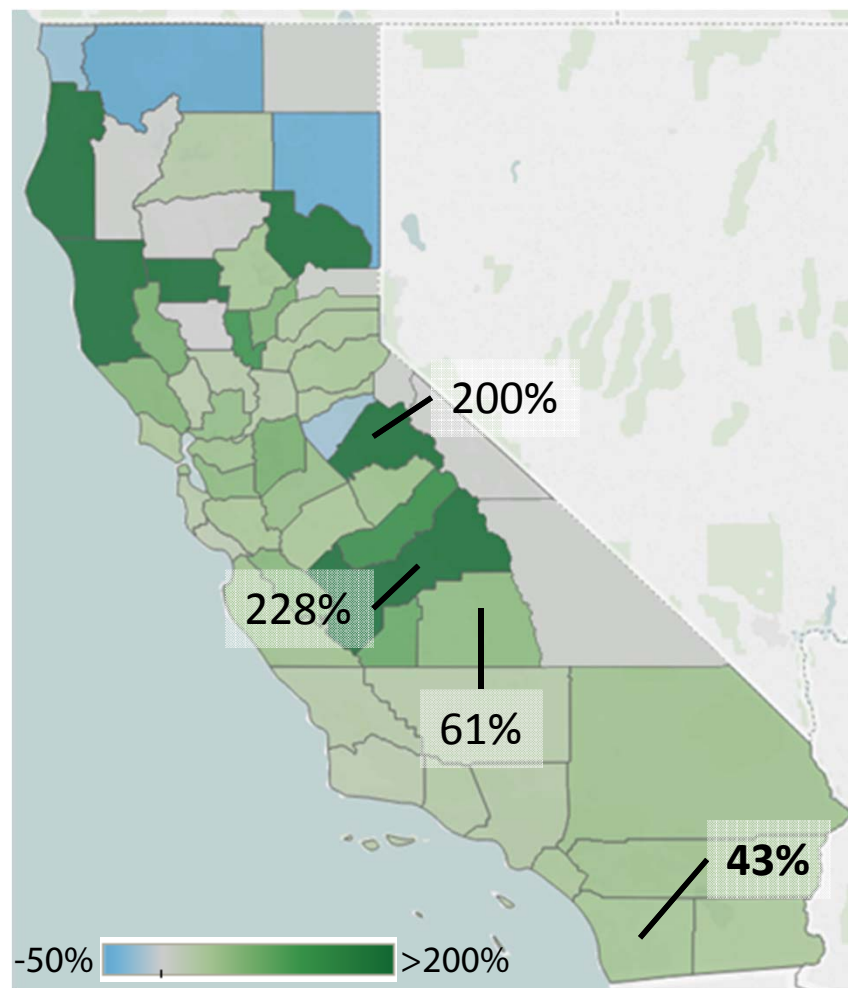


# EV Density and Changes

New ZEV registrations (2010–2014) per 1,000 population (18 or older)

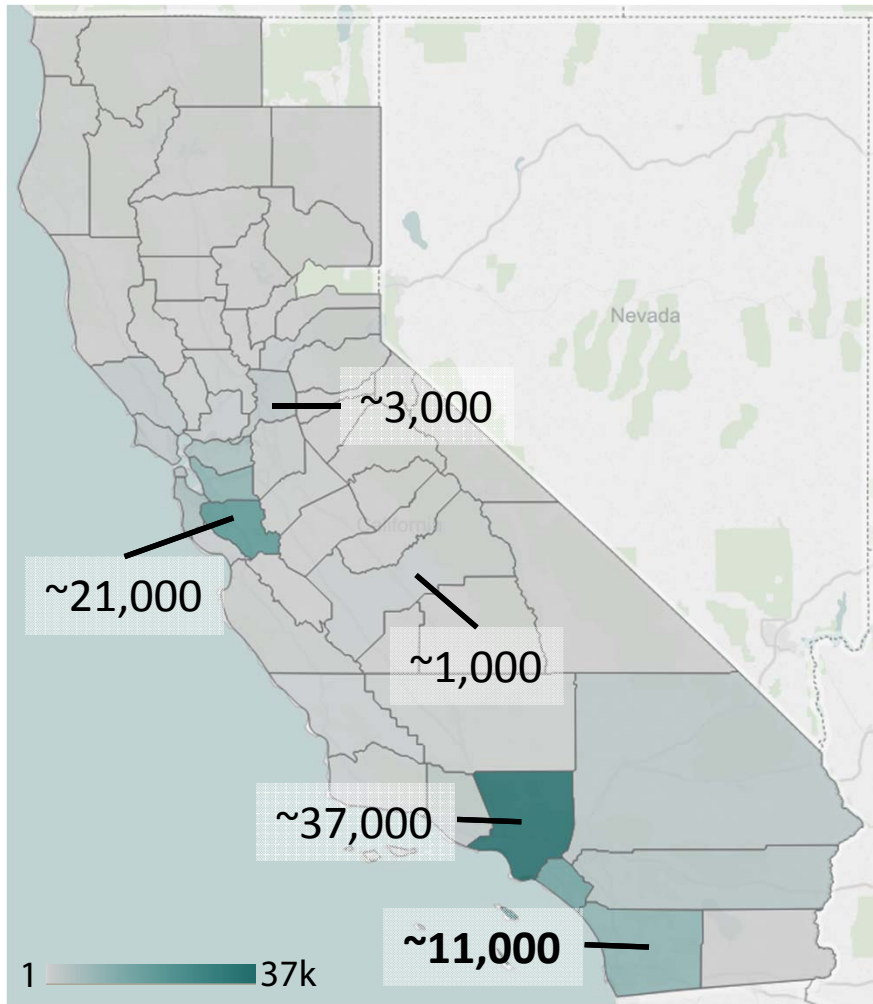


Percent change in density, 2013–2014

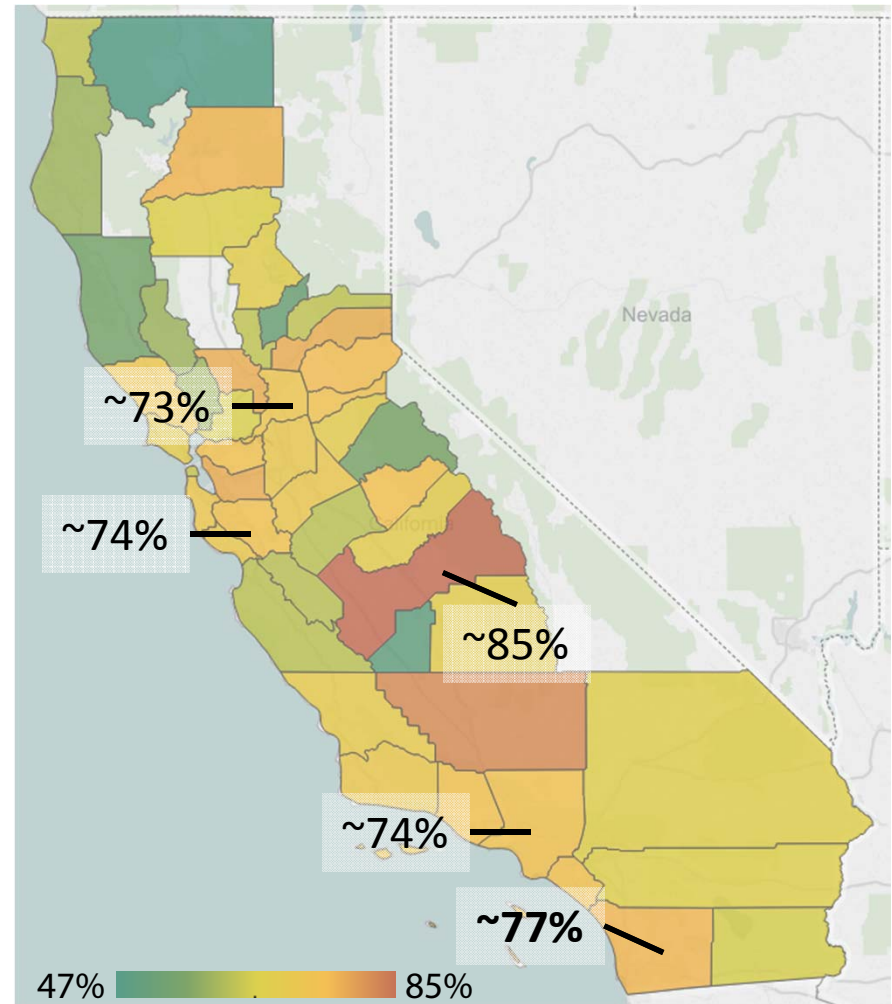


# Registrations by County (Mar 2010 – Mar 2015)

## New Clean Vehicle Registrations

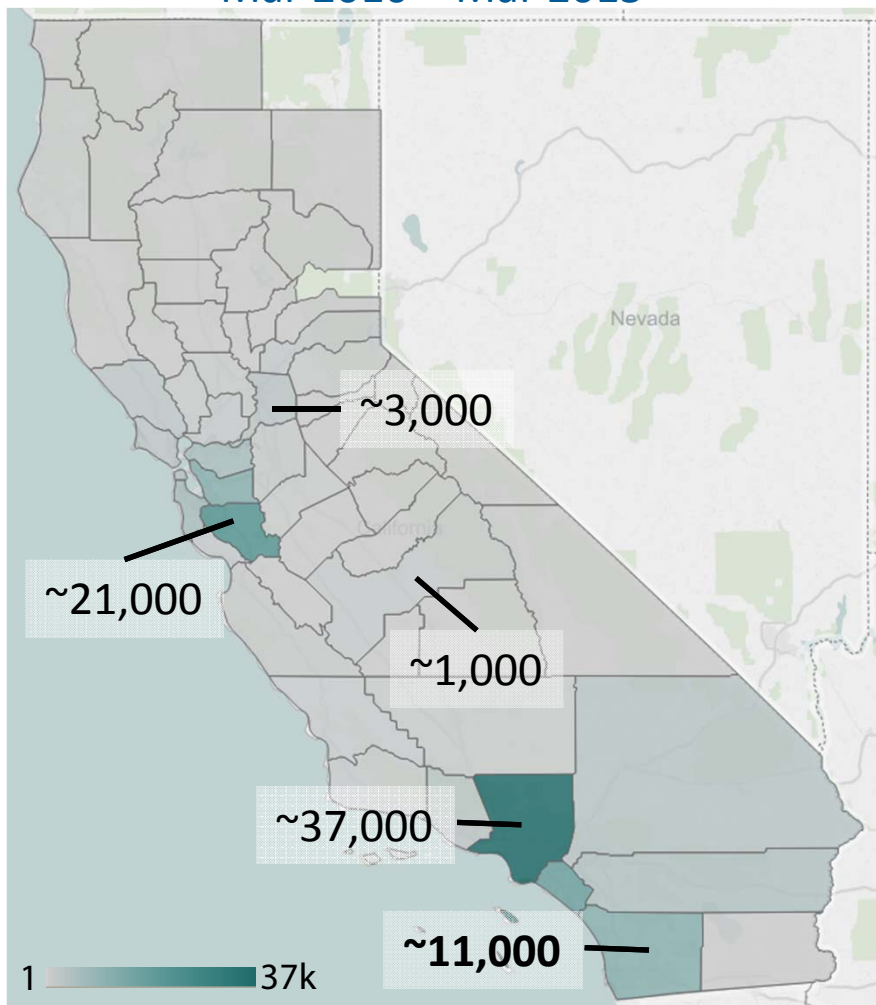


## CVRP Uptake

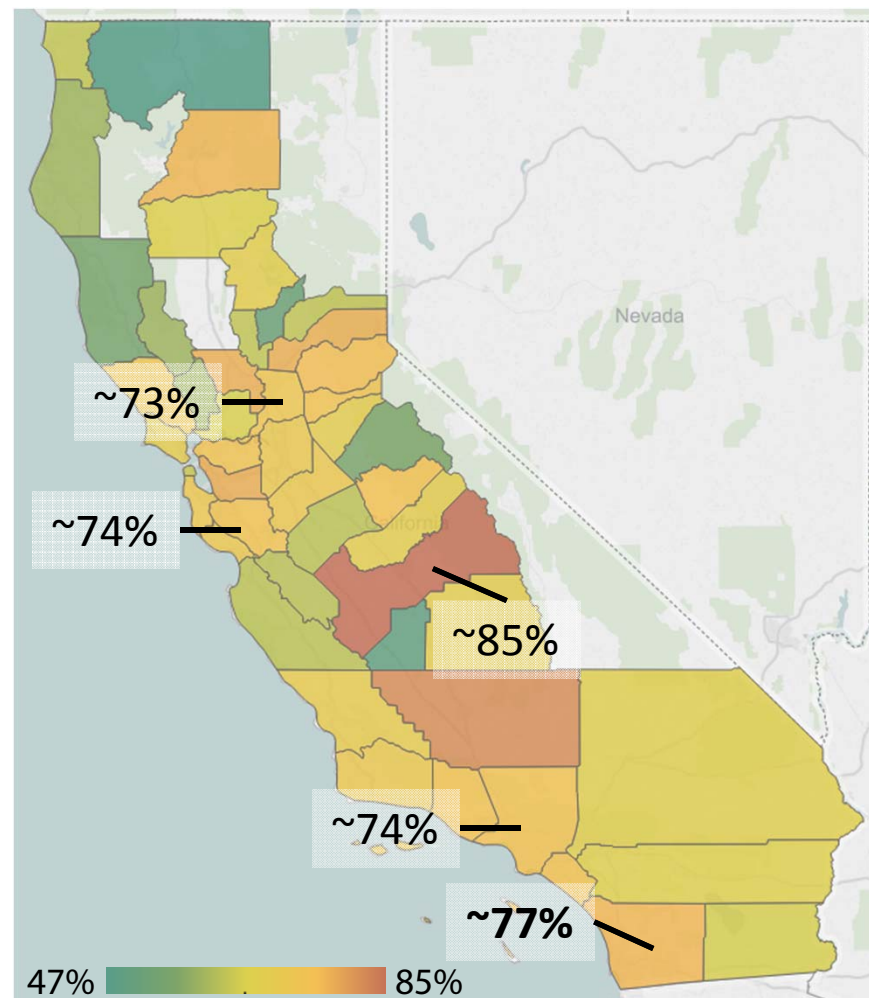


# Registrations by County

## New Clean Vehicle Registrations Mar 2010 – Mar 2015



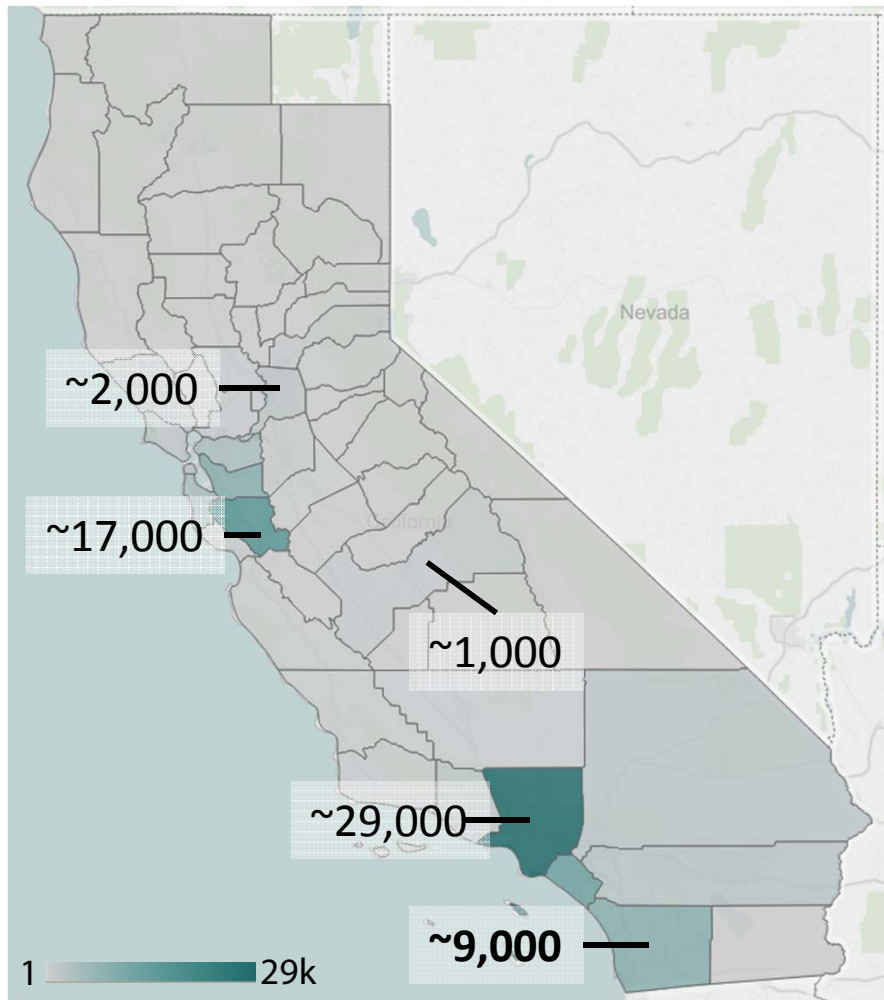
## CVRP Uptake Mar 2010 – Mar 2015



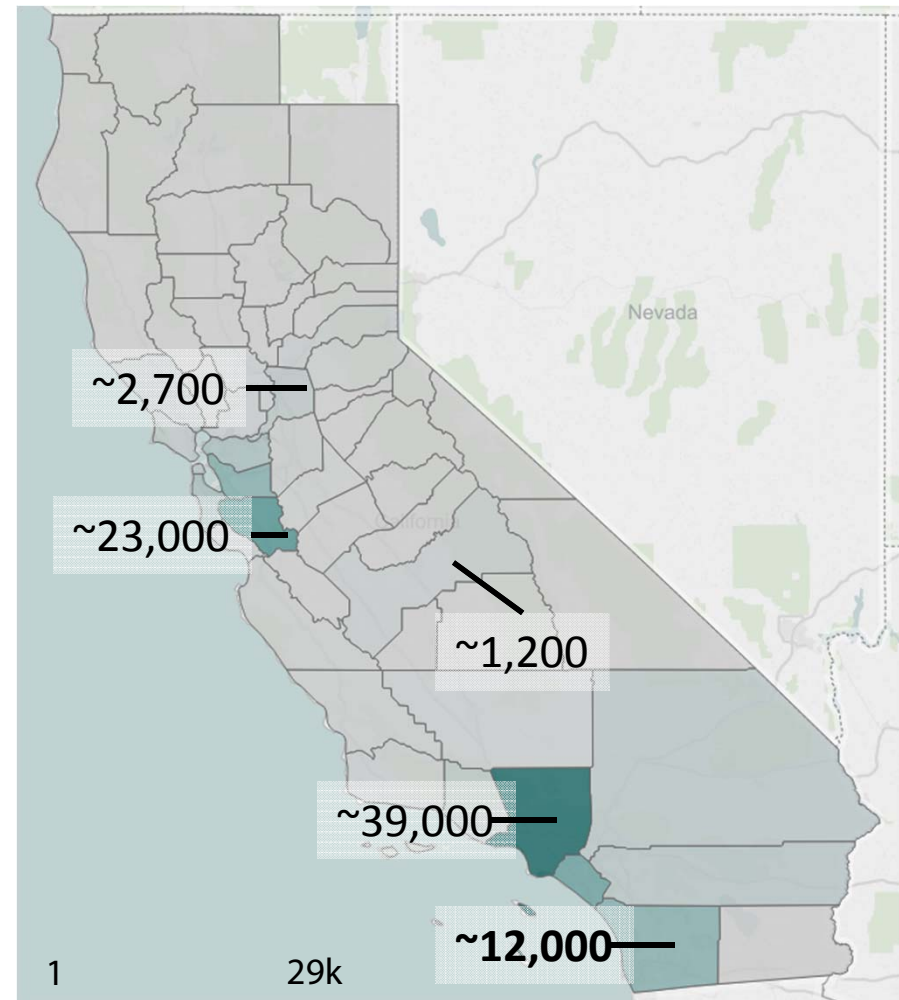


# CVRP Rebates and Uptake Rate

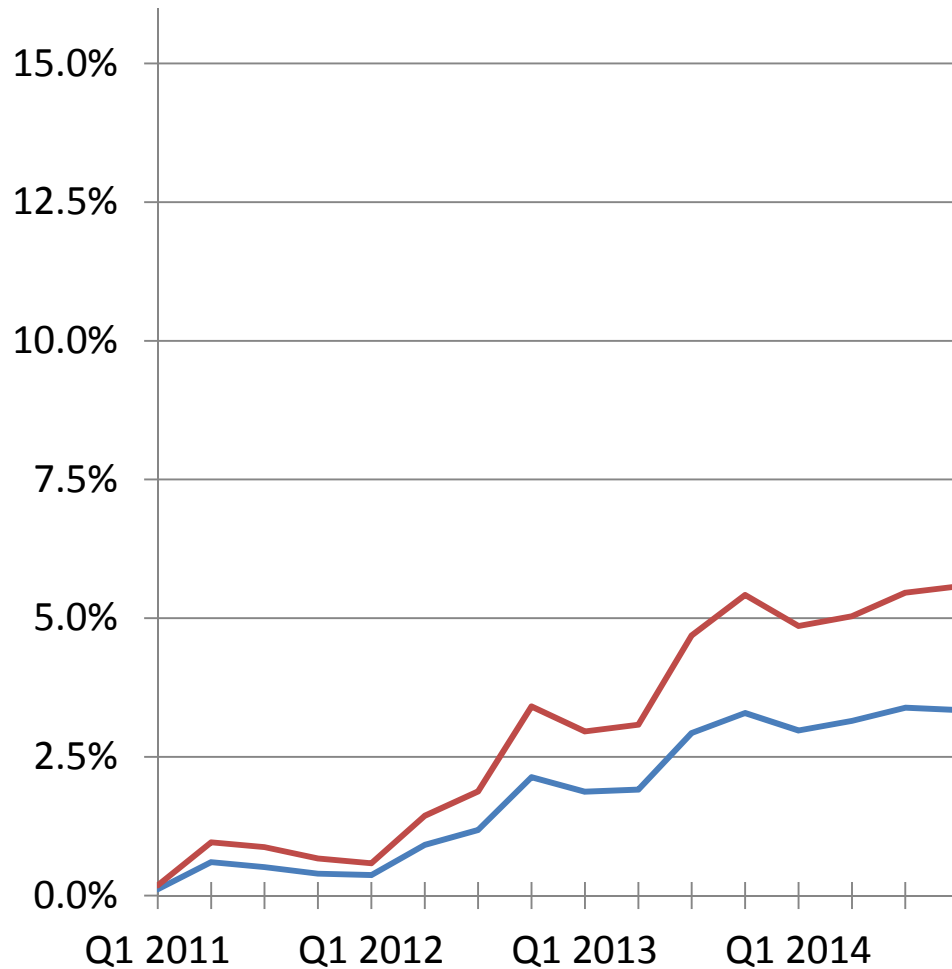
CVRP Rebates  
Mar 2010 – Jul 2015



EV Sales Estimate (Uptake-Adjusted Rebates)  
Mar 2010 – Jul 2015



# California ZEV Market Share



## Q4 2014 Market Share

- 5.5% of new cars
- 3.4% of new light-duty vehicles

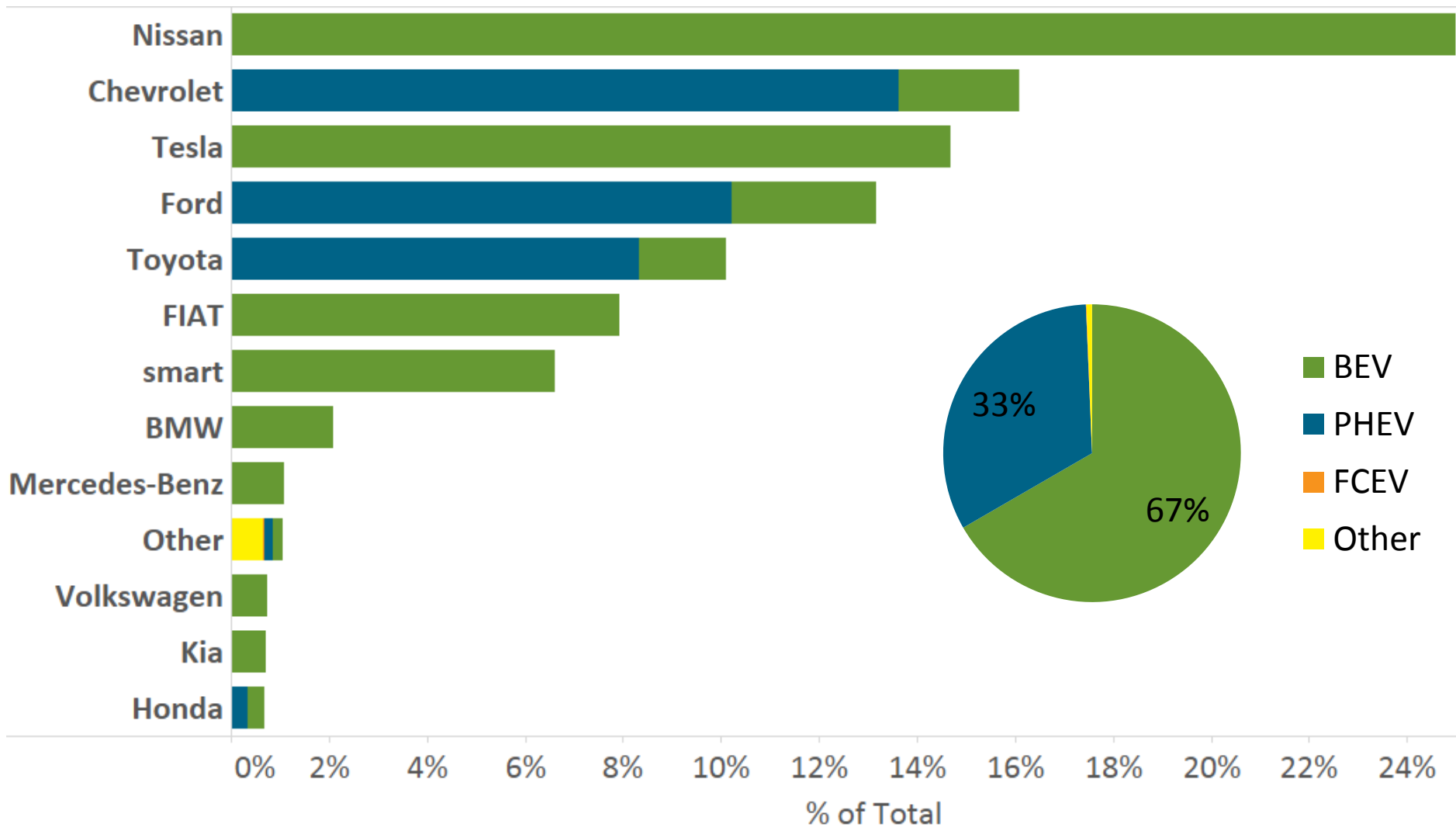
— New Car Market Share  
— New Light-Duty Vehicle Market Share



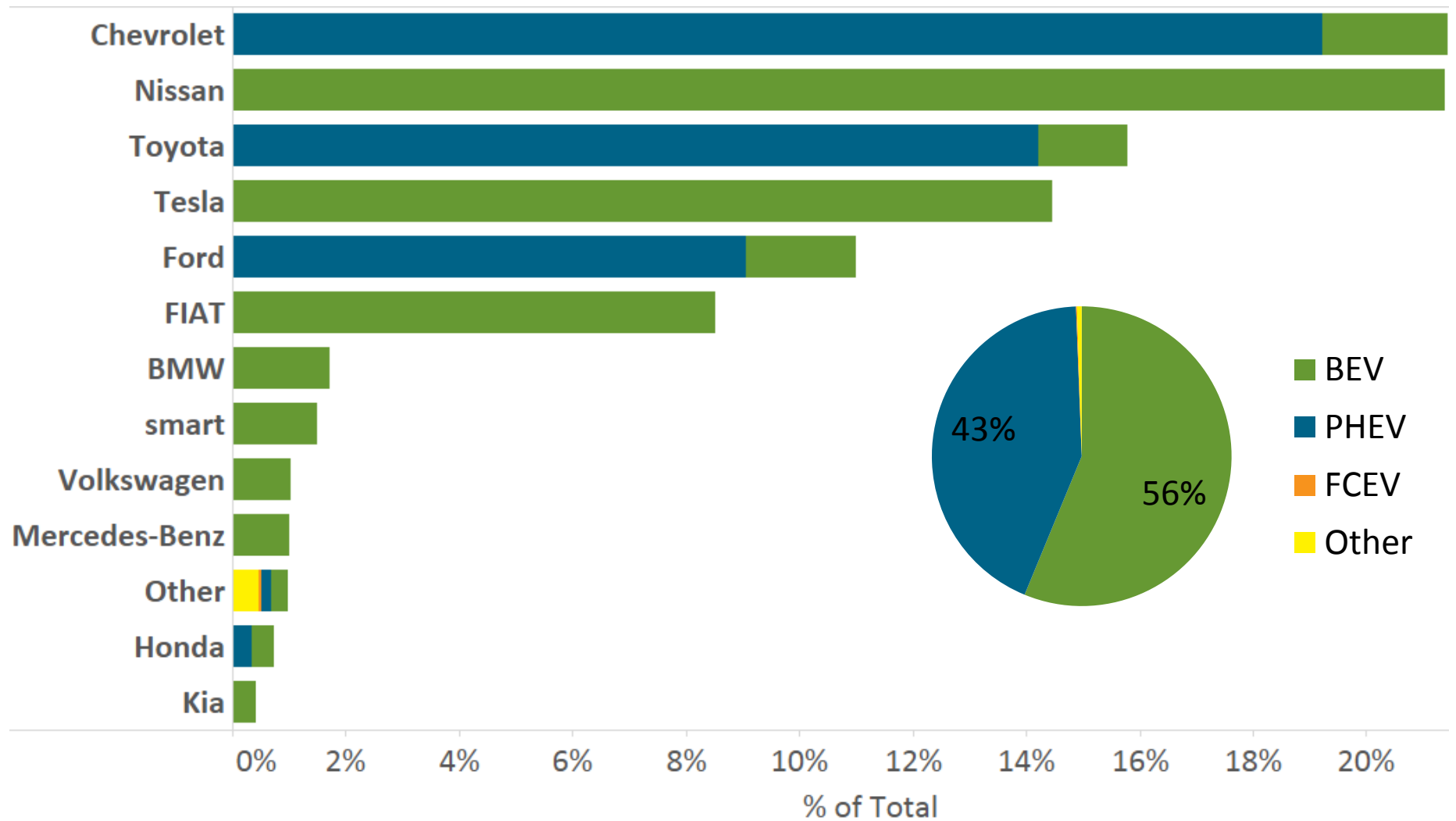
## **OPTION 1: Polk Data and Uptake**



# San Diego EV Market: Rebates



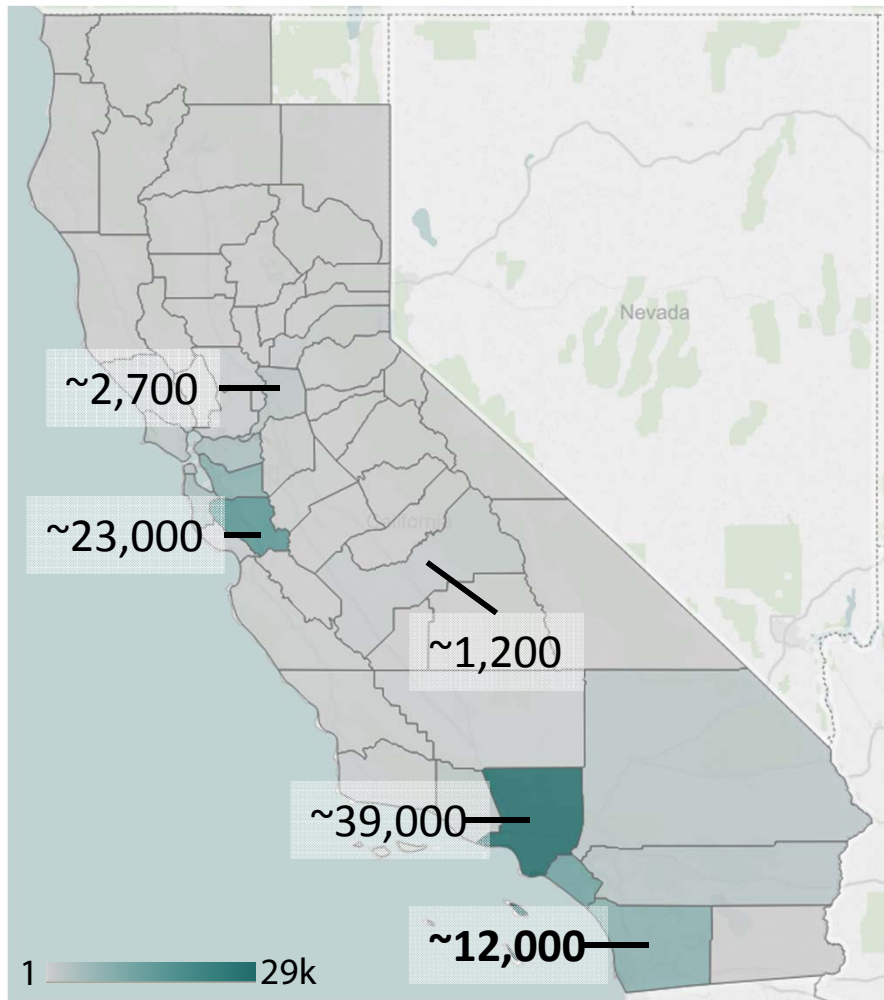
# Rest of State: Rebates



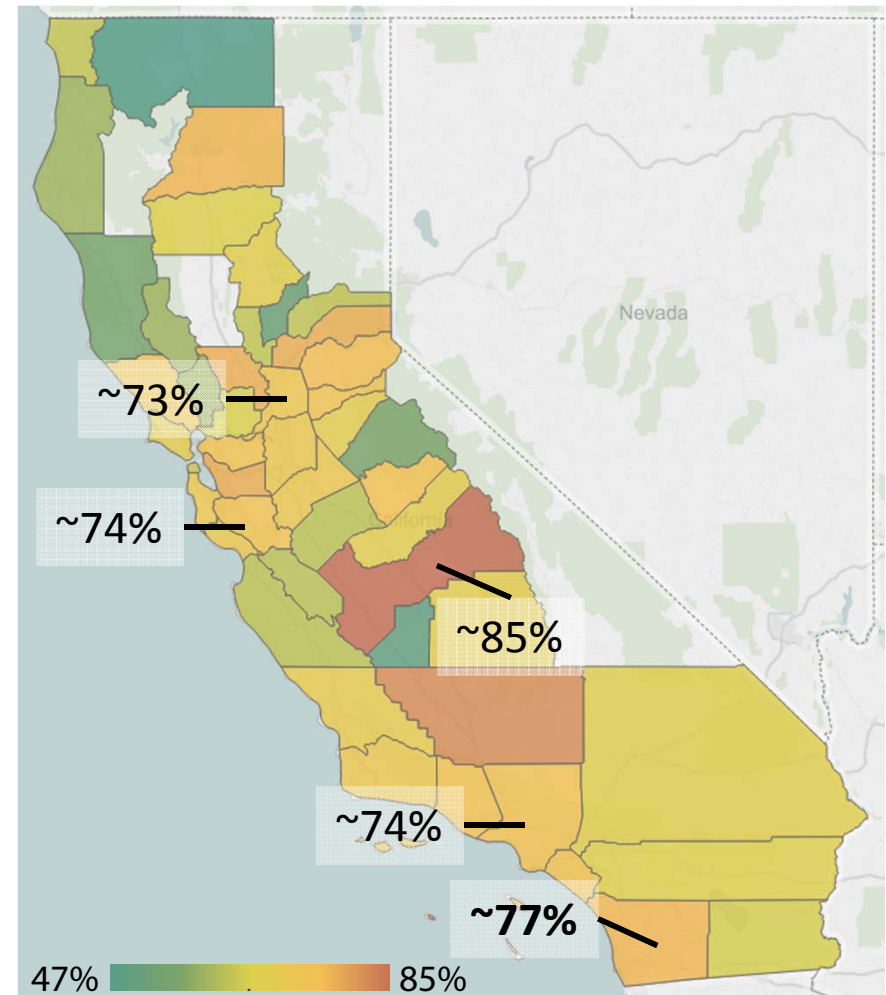


# EV Sales Estimate and Uptake Rate

EV Sales Estimate (Uptake Adj. Rebates)  
Mar 2010 – Jul 2015



CVRP Uptake  
Mar 2010 – Mar 2015



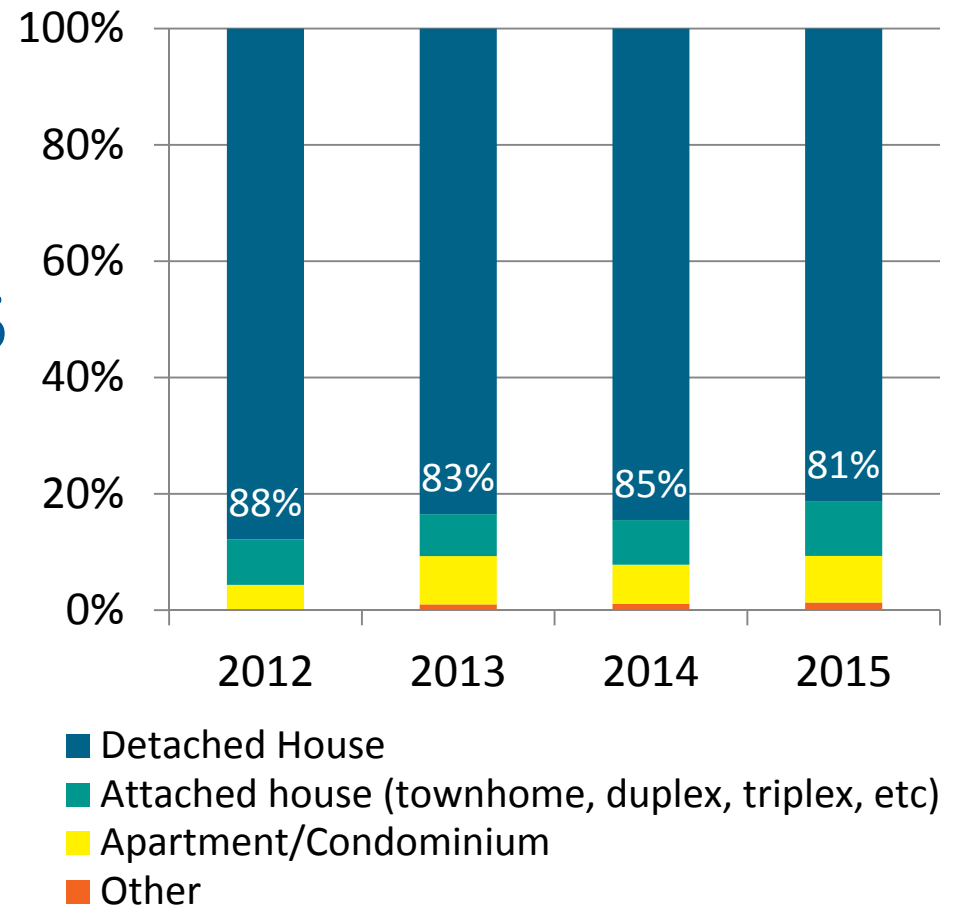


## **OPTION 2: Rebates and Uptake**

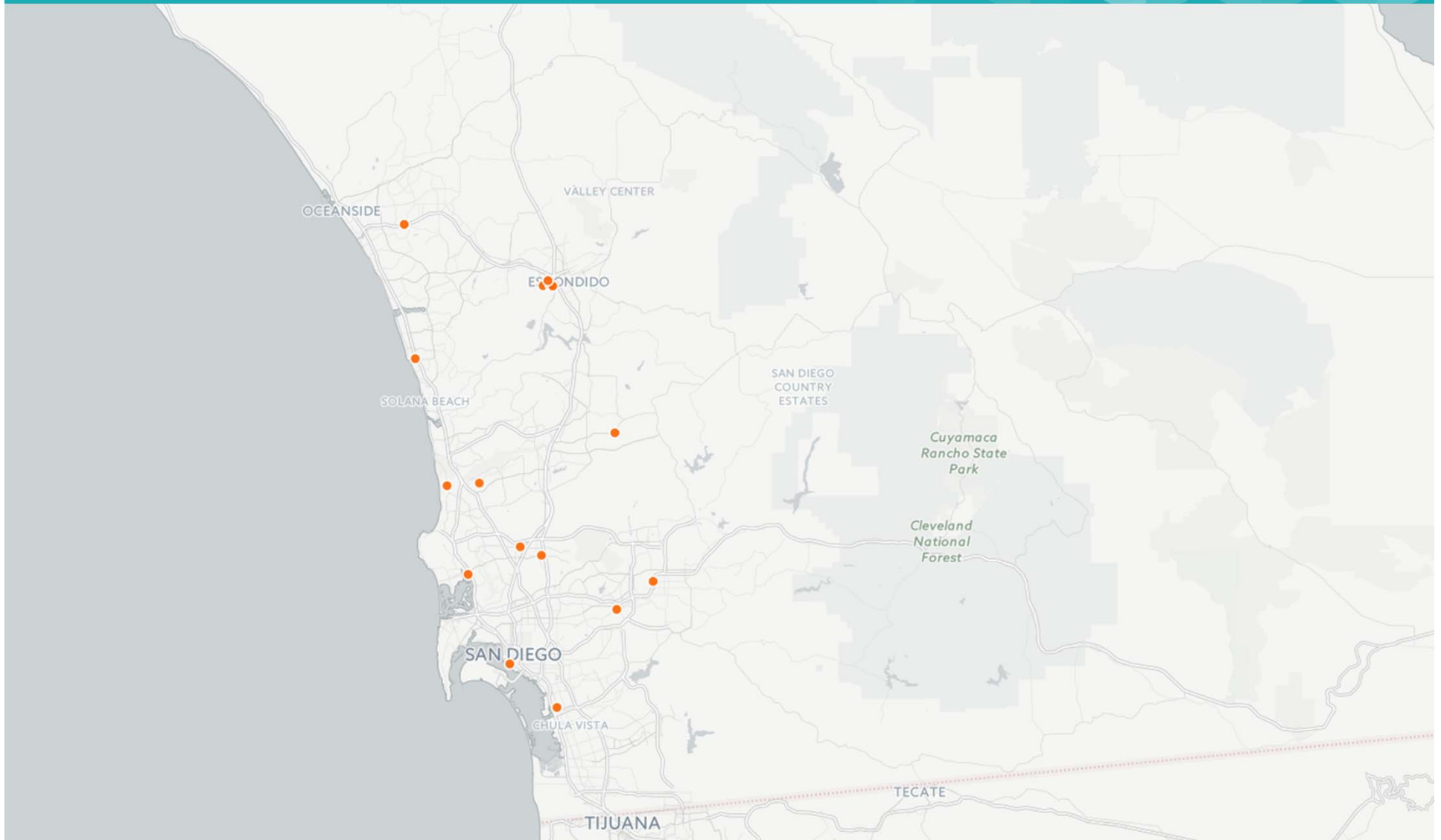


# Demographics

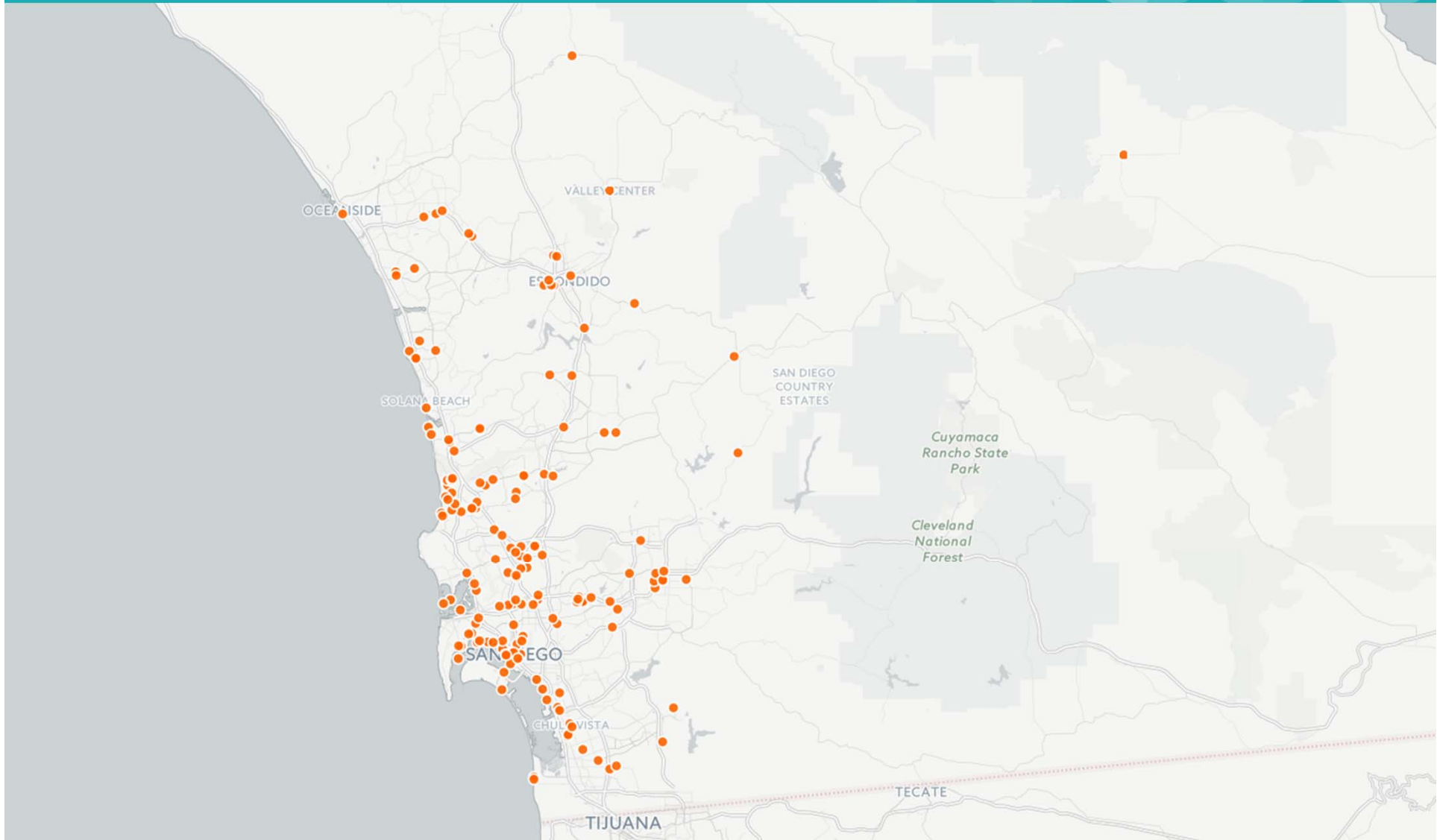
- ~7% increase in housing other than detached single family homes from Q3 2012 – Q2 2015
  - Q1 and Q2 2015: 19% attached homes, apartments/condos, or other
- No other demographic changes evident



# Public Electric Vehicle Charging Sites - 2012

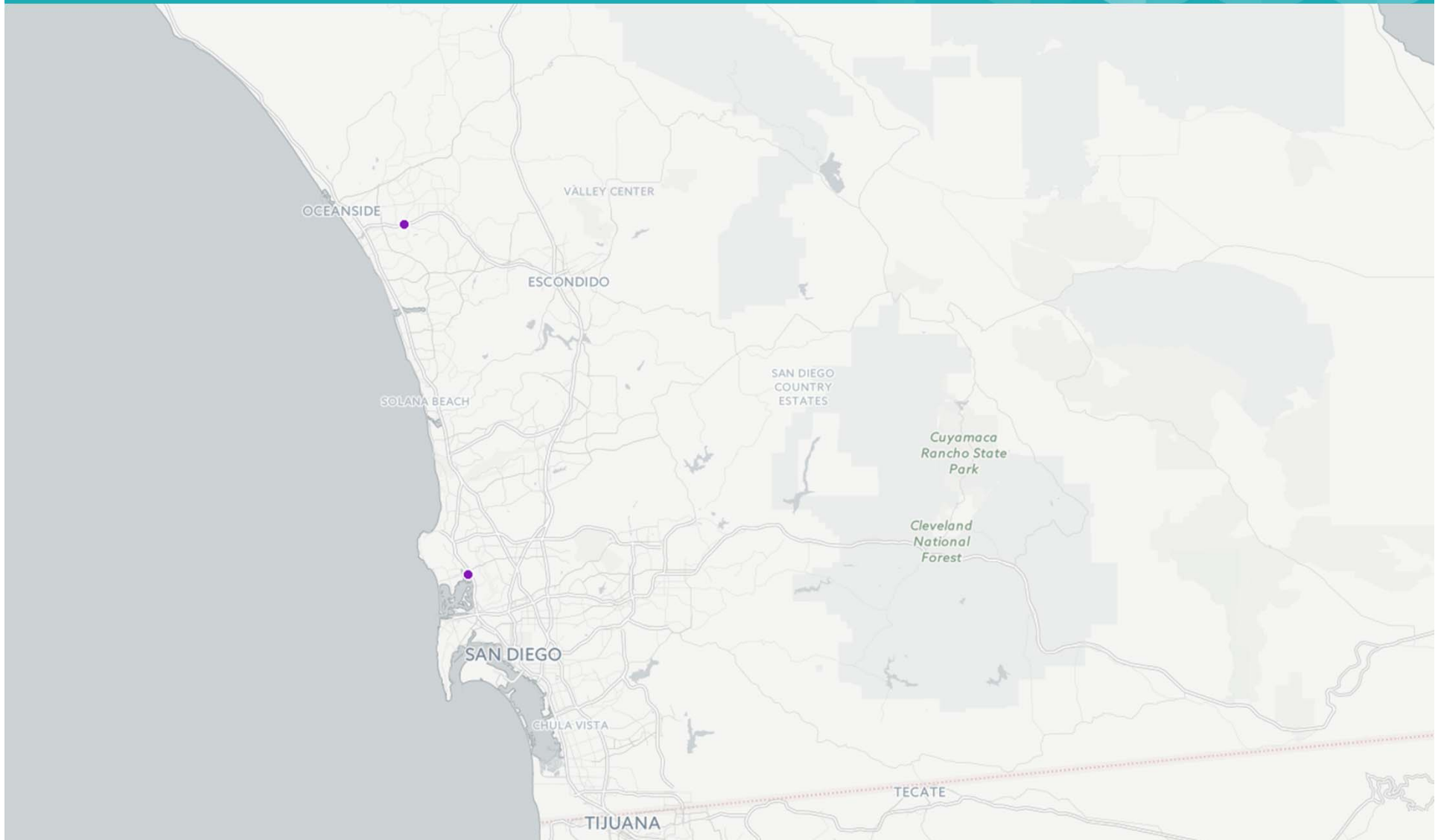


# Public Electric Vehicle Charging Sites - 2015



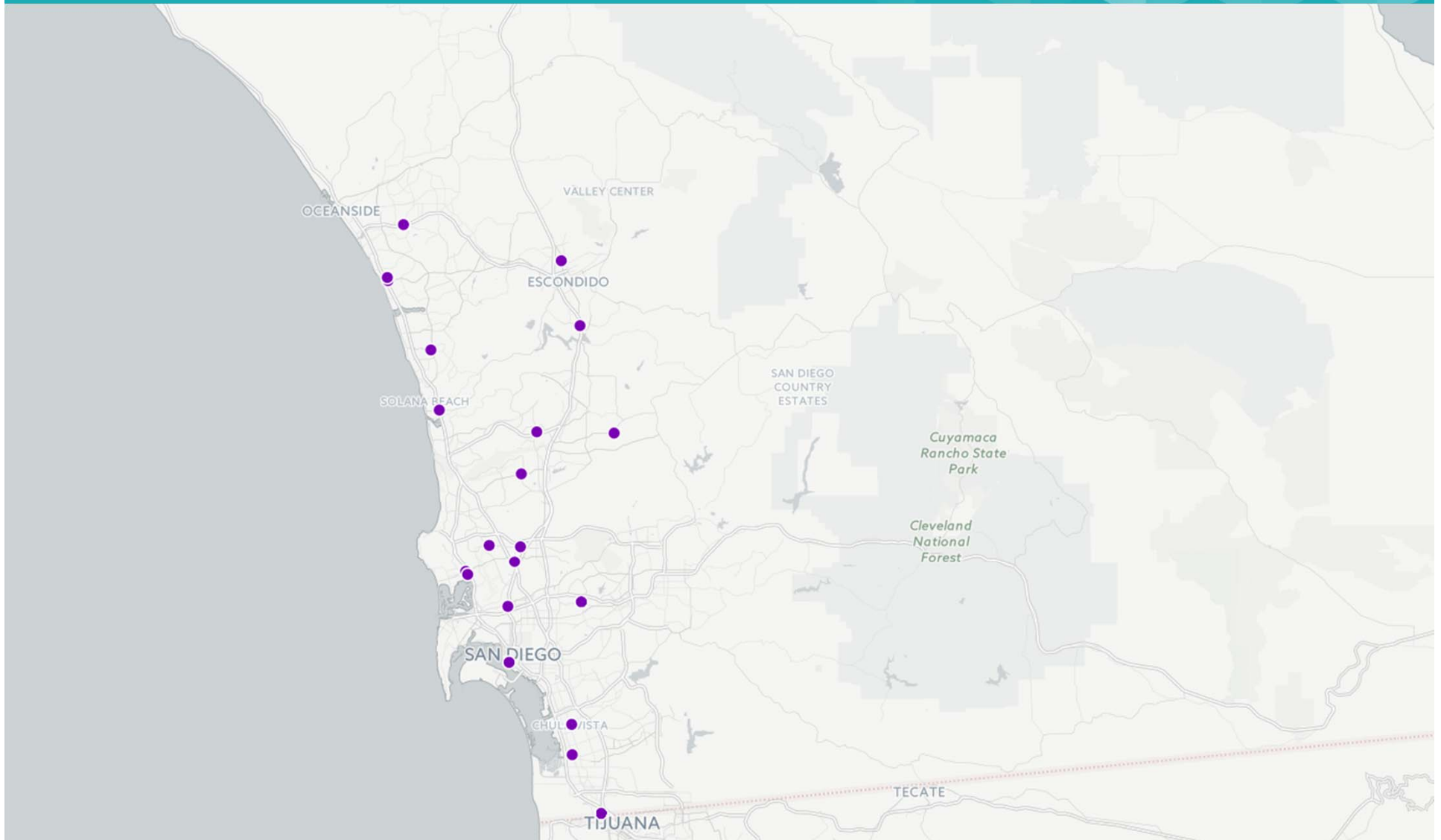


# Public DC Fast Charging Sites - 2012

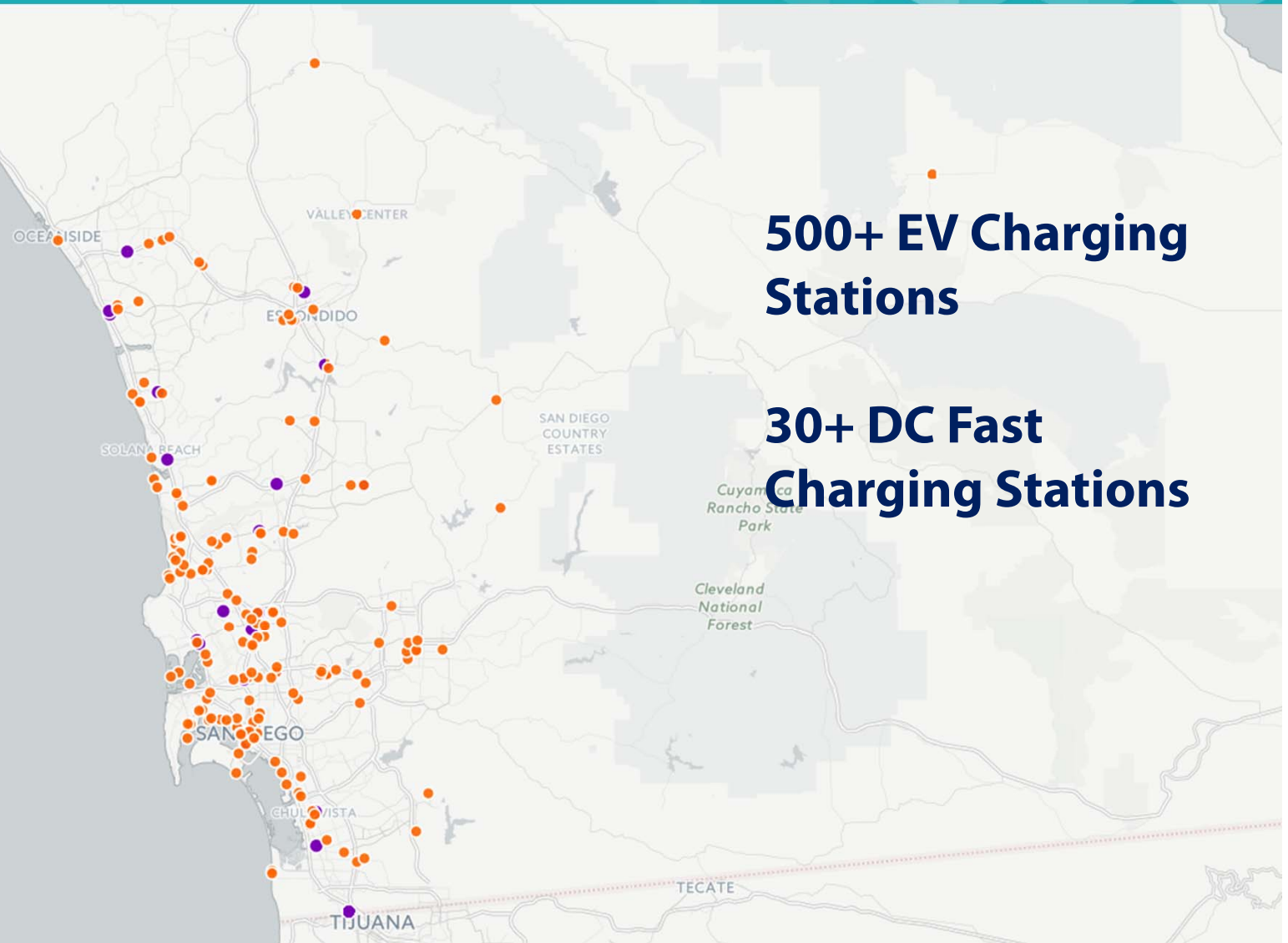




# Public DC Fast Charging Sites - 2015



# Total Public Charging Sites





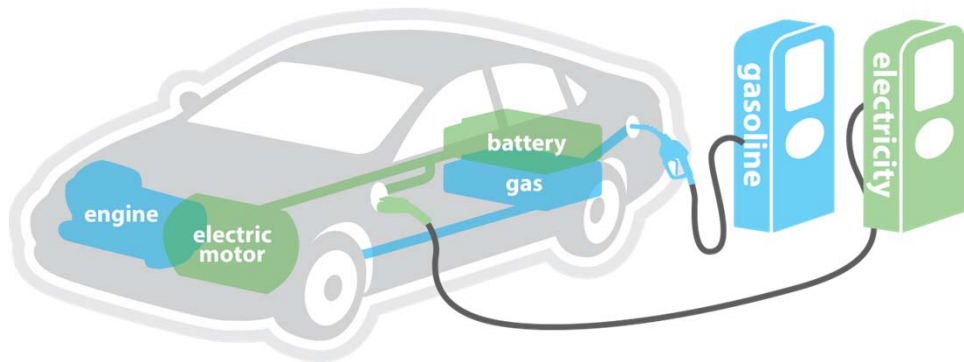
# PEV 101



# Plug-in Electric Vehicles

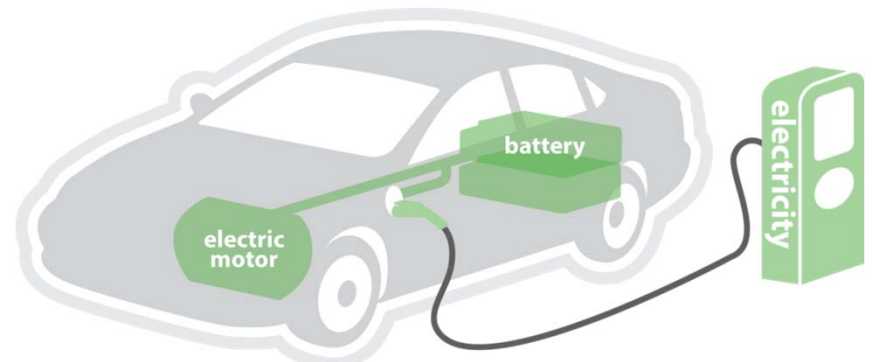
## Plug-in Hybrid Electric Vehicle

- Runs on gasoline and electricity from grid
- Up to 40 miles on electricity, 150 to 400 miles total range, depending on model



## Battery Electric Vehicle

- Runs entirely on electricity that is stored on an onboard battery
- Range of 60 to about 100 miles, depending on model





# Vehicles on the Road

All-battery

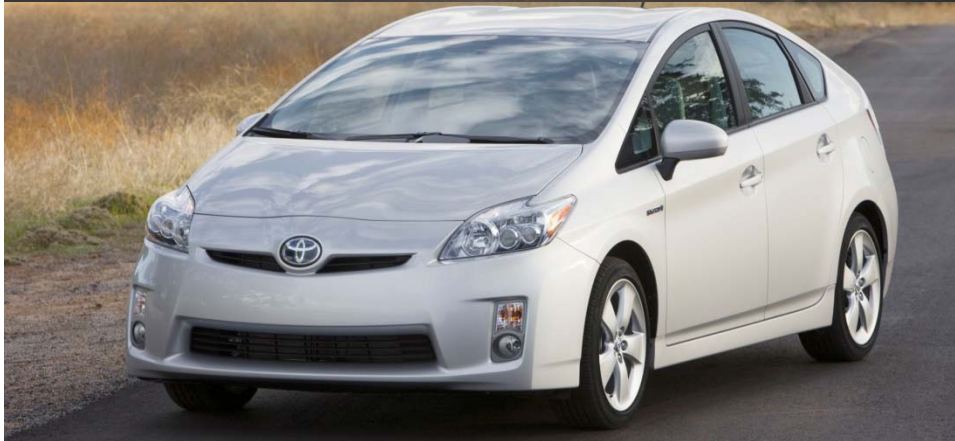
Fuel: 100% Electric





# Vehicles on the Road

## Plug-in Hybrid Electric Vehicle Fuel: Electric and Gasoline











# New and Upcoming Vehicles








# 2014 Additions (All-Battery, Plug-in Hybrid, and Fuel-Cell )






	Vehicle	Vehicle Category	EPA Fuel Economy	EPA Range
	Cadillac ELR	PHEV	82 mpg <sub>e</sub> , 33 mpg (gas)	37 e-mi 340 total
	Hyundai Tucson Fuel-Cell	FCEV	48–50 kg/mi (city–hwy)	265 mi
	BMW i3, i3 REx	BEV, BEVx	124 mpg <sub>e</sub> , 117 mpg <sub>e</sub>	81 e-mi, 72 e-mi; 150 total
	Mercedes B-Class Electric	BEV	84 mpg <sub>e</sub>	87 e-mi
	Kia Soul EV	BEV	105 mpg <sub>e</sub>	93 e-mi
	Volkswagen e-Golf	BEV	116 mpg <sub>e</sub>	83 e-mi



# Upcoming PHEVs





	Vehicle	Vehicle Category	Expected Release
	<b>Volvo V60 PHEV</b>	PHEV	2015
	<b>Volkswagen Golf GTE</b>	PHEV	2015
	<b>Audi A4 e-quattro</b>	PHEV	2015
	<b>Audi A3 e-tron</b>	PHEV	2015
	<b>Hyundai Sonata Plug-in Hybrid</b>	PHEV	2015

# Upcoming PHEVs

	Vehicle	Vehicle Category	Expected Release
	Chevrolet Volt (MY2016)	PHEV	2015
	Mercedes S500 Plug-in Hybrid	PHEV	2015
	Mitsubishi Outlander PHEV	PHEV	2015
	Volvo XC90 T8 Plug-in Hybrid	PHEV	2015
	Mercedes C350 Plug-in Hybrid	PHEV	2016



# Upcoming BEVs and FCEVs

	Vehicle	Vehicle Category	Expected Release
	Tesla Model X	BEV	2015
	Chevrolet Bolt	BEV	2016
	Infiniti LE	BEV	2017
TBD in 2017	Tesla Model 3	BEV	2017
	Toyota Mirai	FCEV	Fall 2015



# Benefits of Driving Electric



# Benefits: Lower Fuel Costs

On average, it costs about half as much to fuel an electric vehicle.

regular  
gasoline

3.69

electric  
eGallon

1.68

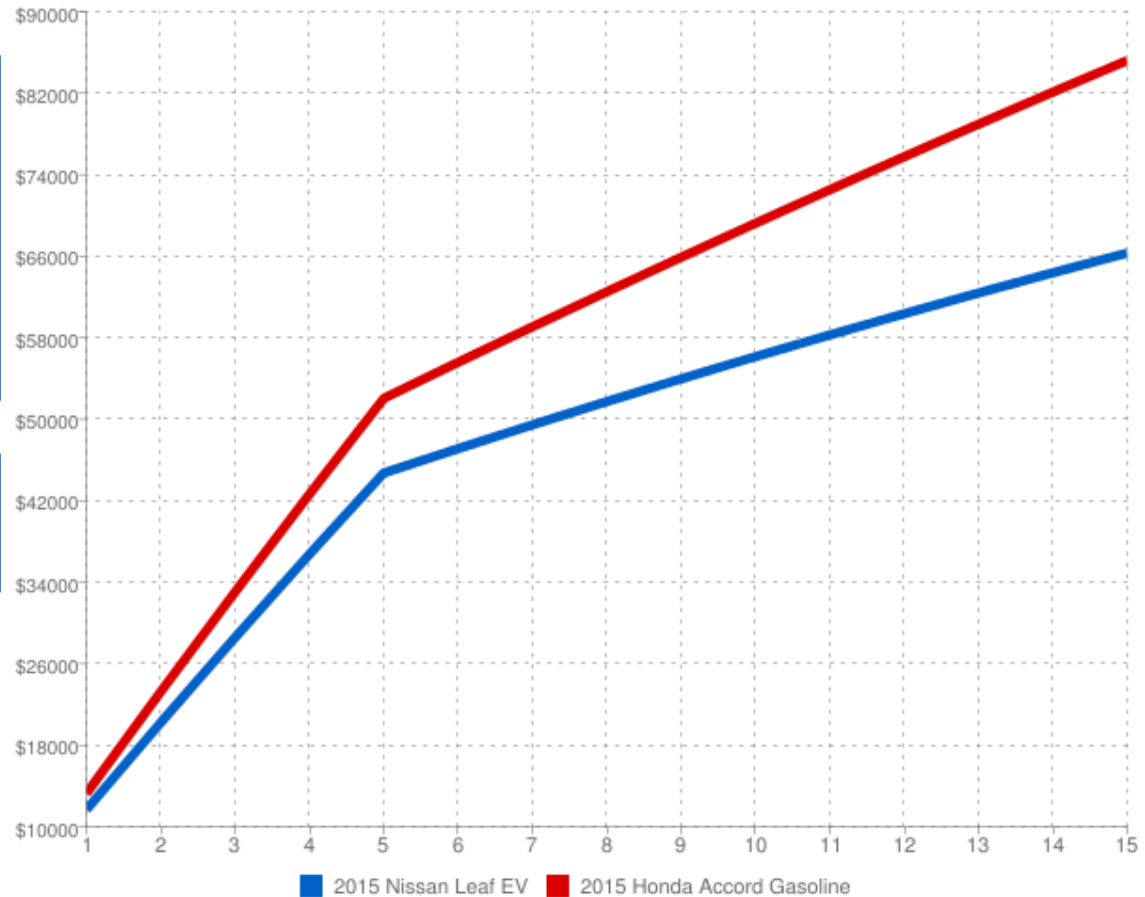
# Benefits: Lower Total Cost of Ownership

Cumulative Cost of Ownership by Year (Dollars)

Savings of ~\$8,000 at 7 years of ownership

Savings of ~\$20,000 at 15 years of ownership

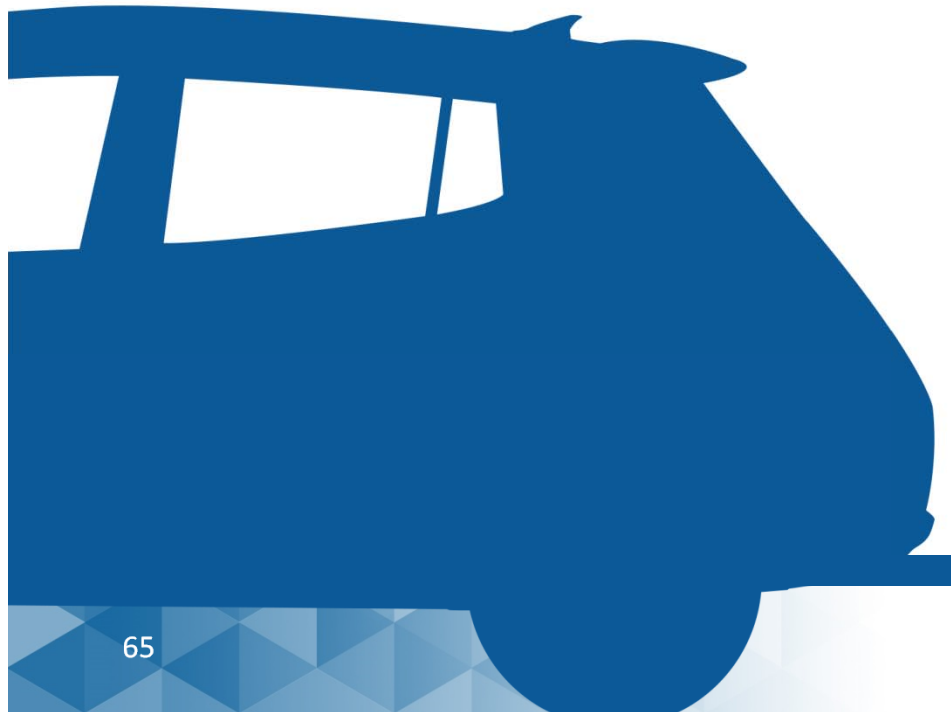
Typical EV owner saves \$750-\$1200 in fuel costs



Source: AFDC Vehicle Cost Calculator

## Benefits: Public Health

# Cleaner Air:

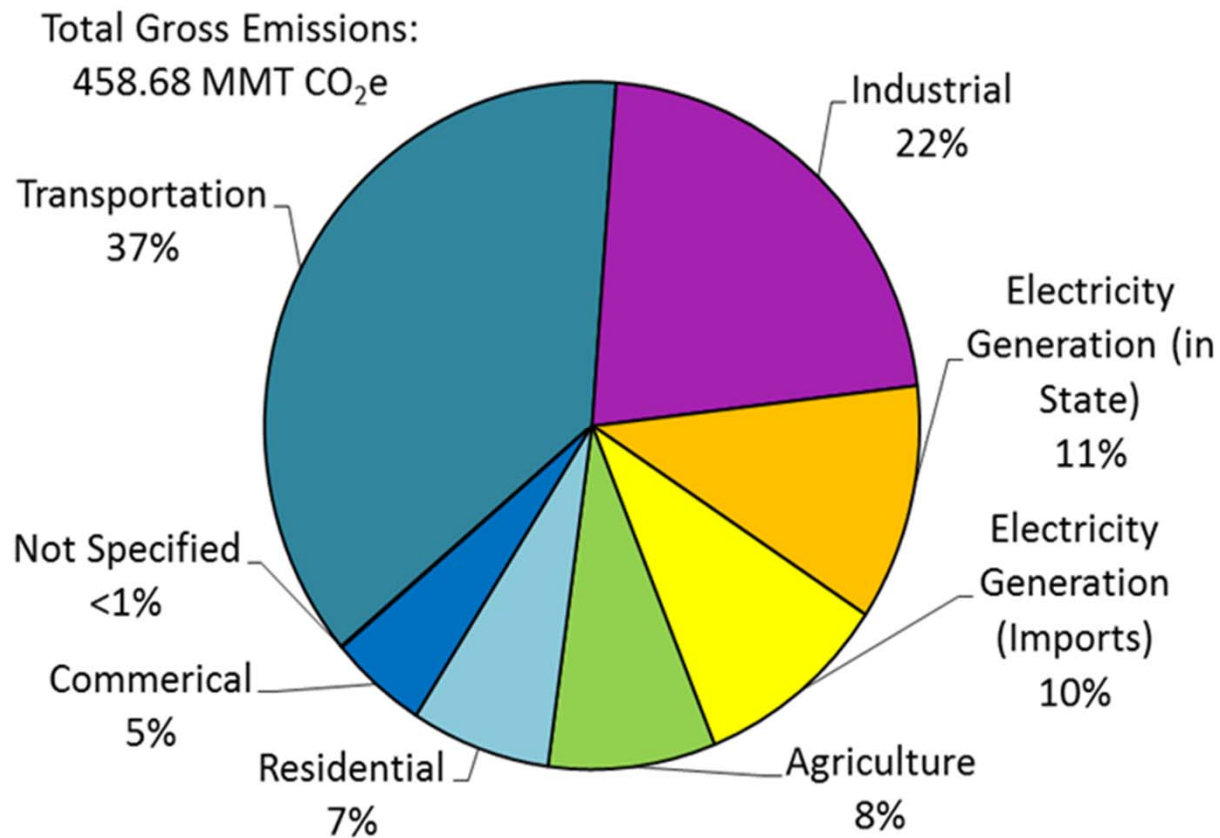


- California vehicles emit 272 tons of smog-forming VOCs and NOx per day
- Improving air quality to federal eight-hour ozone standard could save over \$2.5 billion in medical costs and lost work days
- 30% increased risk for new asthma cases in children living in communities with higher vehicle traffic



# Benefits: GHG Emissions Reductions

California GHG Emissions



# Benefits: Time Savings



**All-battery EVs**  
*Currently unlimited availability*



**Plug-in hybrid EVs**  
*Limited number available*

Valid until January 1, 2019



# Benefits: FUN!

## Performance!





# Charging Options



# Charging Equipment: L1 & L2

## AC Level 1

- Uses a standard 110/120-volt alternating current (VAC) three-pronged wall plug
- 4-6 miles per hour of charge



## AC Level 2

- Uses 208/240 VAC and can be hardwired or connected with a plug
- 8-24 miles per hour of charge





# Charging Equipment: DC Fast Charging

- Uses commercial-grade 440 /480 VAC – produces direct current (DC) to charge
- Commercial/Public – due to costs
- Charges vehicle 80% in 30 minutes

