

Clean Vehicle Rebate Project Participation Rates: The First Five Years (March 2010 – March 2015)

Center for Sustainable Energy^{1,2}

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Overview

The following summarizes participation in the Clean Vehicle Rebate Project (CVRP), California's state rebate program for plug-in and fuel-cell electric vehicles. Over the first five years of the program, roughly three-quarters (>74%) of eligible purchases and leases were rebated. Over two-thirds (>67%) of plug-in hybrid electric vehicle (PHEV) consumers, and over four-fifths (>81%) of all-battery electric vehicle (BEV) consumers, participated. Variations in participation over time, by vehicle brand, and by county are illustrated, and factors that contribute to program participation and uncertainty in the estimation of participation rates are discussed.

Introduction

The California Air Resources Board's Clean Vehicle Rebate Project (CVRP) provides rebate checks to California individuals, businesses and government agencies for the purchase or lease of qualified clean vehicles, including plug-in hybrid, all-battery and fuel-cell electric vehicles. Rebated vehicles constitute a majority of new clean-vehicle sales in the state, but some consumers do not apply for a rebate and some consumers and vehicles are not eligible for the project.³ It is useful to know how many rebates are issued as a percentage of total eligible vehicle sales — or the program's "participation rate" — for a variety of purposes. These include assessing program participation from various perspectives, evaluating program impact, understanding how representative the program is of the overall clean-vehicle market in California, projecting program demand and extrapolating sales. These uses can inform activities by clean-vehicle stakeholders, including policymakers, public and private planners and utilities.

To estimate CVRP participation rates, rebate data for 100,790 clean vehicles was compared to new registrations⁴ identified as eligible for CVRP.⁵ Details concerning the possible overestimation or underestimation of participation rates are included in Appendix A. However, in general it is expected that the following participation rates are modestly underestimated; as such, rates will be loosely and interchangeably characterized as "at least" and "approximately."

¹ Recommended citation: Williams, B., Anderson, J., Santulli, C., and Arreola, G. (2015), "Clean Vehicle Rebate Project Participation Rates: The First Five Years (March 2010 – March 2015)," Center for Sustainable Energy, San Diego CA, October.

² Thanks also to Timothy Treadwell, John Horn, Ria Langheim, and Clair Johnson

³ For a complete list of eligibility criteria, see <https://cleanvehiclerebate.org/eng/eligibility-guidelines>.

⁴ Registration data licensed from R.L. Polk & Co; Copyright R.L. Polk & Co, 2015. All rights reserved.

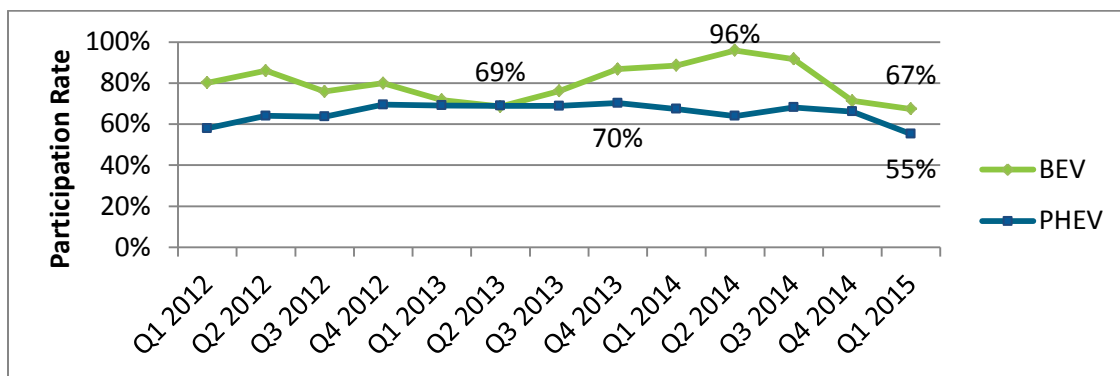
⁵ Vehicles are identified as CVRP eligible by make (brand), model, series, sub series and registration month.

Participation Rates: Overall, by Vehicle Category and by Vehicle Brand

From March 2010 (the beginning of the program) through the end of March 2015, at least **74%** of eligible vehicles applied for and received a rebate. Analysis by major⁶ vehicle category shows participation by plug-in hybrid electric vehicle (PHEV) consumers was at least **67%**, considerably lower than participation by consumers of all-battery electric vehicles (BEVs), which was at least **81%**.

Participation rates have varied over time, as shown in Figure 1. Participation has exceeded 70% for PHEV consumers and over 96% for BEV consumers. The first quarter of 2015 saw low participation, approximately 55% and 67%, for PHEV and BEV consumers respectively. In only one quarter has PHEV participation been comparable to BEV participation (Q2 2013).

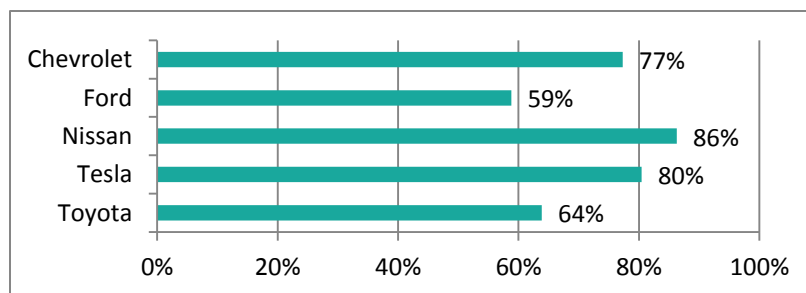
Figure 1. CVRP Participation Over Time* by Major Vehicle Category



*Dates prior to Q1 2012 are not shown due to insufficient data quality

In addition to differences in participation across vehicle category, there is notable variation in participation across vehicle brand, as seen in Figure 2. For major clean-vehicle brands, the rate ranged from approximately 59% for Ford vehicles (11,094 rebates, 82% of which were for PHEVs) up to approximately 86% for Nissan vehicles (23,086 rebates, all for BEVs).

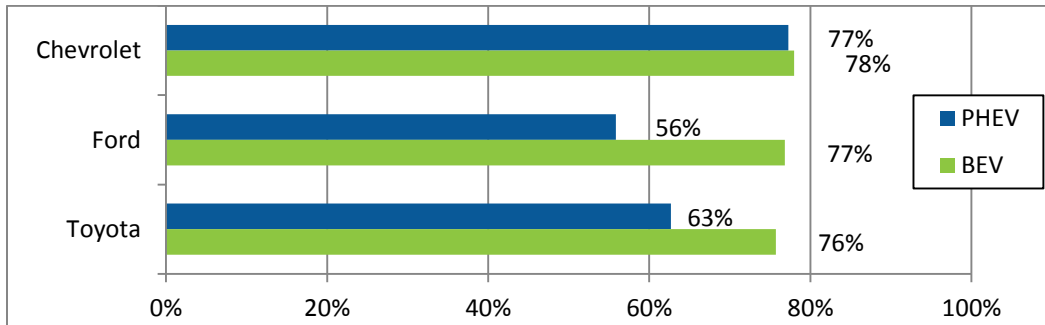
Figure 2. CVRP Participation Rate by Major Vehicle Brand



⁶ “Major” is defined here to mean a classification containing volumes greater than 10,000 vehicles. In the case of “vehicle category,” neighborhood electric vehicles, zero-emission motorcycles and commercial electric vehicles are not considered in any part of this analysis. Fuel-cell electric vehicle (FCEV) participation is included in calculations characterizing the whole program. However, FCEVs are not detailed separately due to extremely low sample sizes (81 total rebates) relative to the other categories (44,009 PHEV rebates and 56,700 BEV rebates).

Figure 3 breaks down the participation rates in Figure 2 for those brands that sell multiple categories of clean vehicles. Participation rates by vehicle category within a given brand echo participation rates for PHEVs and BEVs overall, with one major exception: Chevrolet PHEV (i.e., Volt) consumers have participated at a rate comparable to BEV consumers.

Figure 3. Participation Rate by Vehicle Category (for Major Brands Offering Multiple Categories)



Participation Rates by County

Sizeable geographic variation in participation also exists. Figures 4–6 illustrate participation by county using “heat maps,” and Appendix B provides participation rate by county. Counties with fewer than 100 rebates for the specified vehicle category(ies) have been excluded and labeled “insufficient data.” Participation ranged from approximately 48% for PHEV consumers in Napa County (113 rebates) up to over 95% in for BEV consumers in Fresno County (661 rebates). No counties had 0% participation. High rates of BEV participation were widespread (Figure 6), but the overall picture was mixed.

Figure 4. CVRP Participation by County: PHEVs, BEVs, and FCEVs

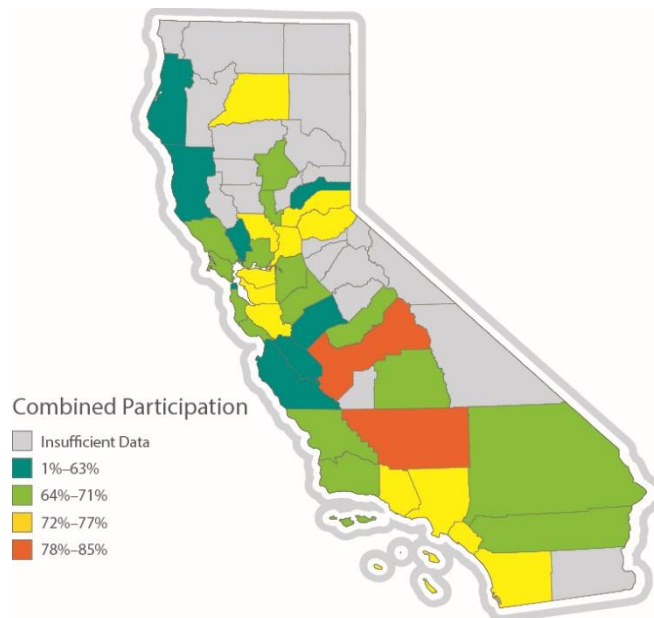


Figure 5. CVRP Participation by County: PHEVs

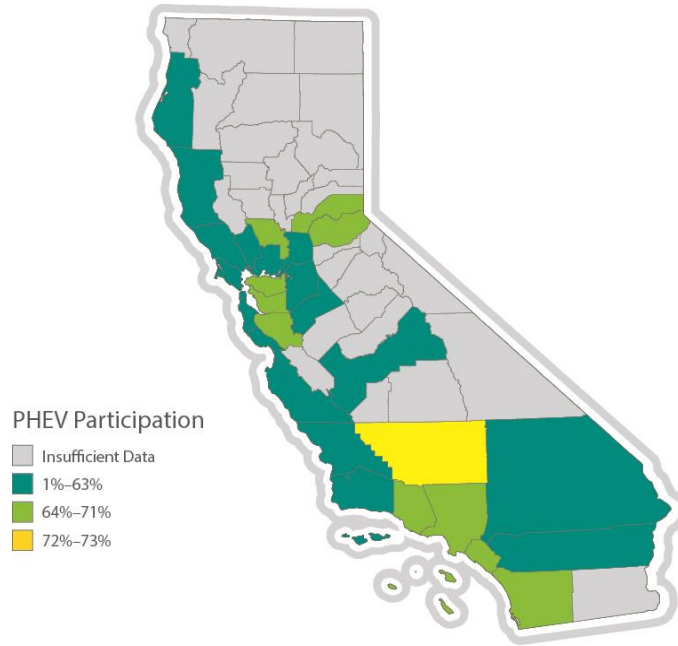
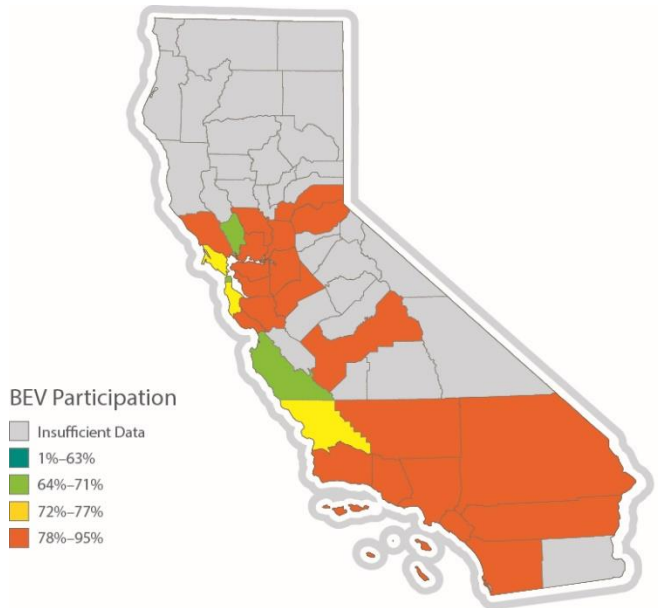


Figure 6. CVRP Participation by County: BEVs



Summary and Discussion

For over five years (March 2010 thru March 2015), roughly three-fourths (at least 74%) of all plug-in and fuel-cell electric vehicle consumers (individual, business and governmental) have participated in the California Air Resources Board's Clean Vehicle Rebate Project.

Over four-fifths (at least 81%) of BEV consumers participated. In contrast, only two-thirds (at least 67%) of PHEV consumers participated. Similarly, variation in adoption exists across vehicle brand (with lower participation generally but not uniformly being associated with PHEV products) and geography (with lower participation generally but not uniformly being associated with PHEVs or more rural counties).

Lower relative participation rates may be due to a variety of factors, including but not limited to

- Lower levels of awareness and/or understanding of the rebate by PHEV consumers or dealers
- Lower absolute or relative incentive to participate (currently, PHEV purchases/leases are eligible for a rebate of \$1,500 vs. \$2,500 for BEV rebates)
- Lower motivation to participate external to the program (e.g., factors relating to consumer or dealer socio-/demo-/psycho-graphics, politics, etc.)
- Greater ability and desire to purchase/lease without the rebate
- Other barriers to participation

Participation rates thus result from a complex set of interacting factors. As such, low rates do not necessarily indicate a problem, so long as the factors are not inhibiting the overall goal of clean-vehicle market acceleration. However, several of these factors present opportunities, for example to strategically target low-participating segments with marketing, education and outreach (perhaps with tailored messaging) or to provide additional or complementary resources supportive of clean-vehicle adoption.

Appendix A: Participation Calculation Considerations

Several factors could lead to overestimation or underestimation of participation rates. For example, purchase and registration date and location may vary slightly, causing imprecision across all estimates. Additional factors identified, which, in aggregate, lead to underestimation of participation rates include (in order of increasing magnitude): pre-eligibility Chevrolet Volts, insufficient registration data for two Honda models and unknown lease terms. Each is discussed in turn.

Pre-eligibility Volts. When introduced, the Chevrolet Volt's internal combustion engine was not certified to emissions standards required for CVRP eligibility. At least 1,861 Volts were sold before a "low-emissions package" was released in February 2012. Volts registered prior to this month have been removed from the registration data and do not impact these participation calculations. However, the project received applications for a small number of ineligible vehicles in the following months, indicating a small number of ineligible Volts continued to be registered. This likely causes negligible underestimation of participation rates.

Insufficient registration data. Registration data records for the Honda Fit EV and Honda FCX-Clarity were insufficient to include in the participation calculations. Totals from both models were excluded from all calculations. This has an unknown, but likely minor, impact on participation rates. During the period, 438 Fit EV rebates and 17 FCX-Clarity rebates were issued.

Unknown lease terms. Finally, vehicles leased for terms of less than 36 months were ineligible to participate in the CVRP until fiscal year 2014–2015, when the requirement was lowered to 30 months (and remains in effect). The registration data used in the participation calculations does allow for isolation of leased vehicles, but does not provide the term, which inhibits exclusion of ineligible, short-term leases from the participation calculations. The inclusion of vehicles with short-term leases results in rate estimates that are lower than the true values by a magnitude that is uncertain but estimated to be a few percent or less.

Appendix B: CVRP Participation by County* (March 2010–March 2015)

County*	PHEV	BEV	PHEV, BEV and FCEV
Alameda	70%	83%	78%
Butte	Insufficient Data	Insufficient Data	68%
Contra Costa	66%	83%	74%
El Dorado	67%	86%	76%
Fresno	59%	95%	85%
Humboldt	55%	Insufficient Data	60%
Kern	73%	89%	82%
Los Angeles	70%	80%	74%
Madera	Insufficient Data	Insufficient Data	69%
Marin	57%	77%	69%
Mendocino	40%	Insufficient Data	56%
Merced	Insufficient Data	Insufficient Data	63%
Monterey	55%	71%	63%
Napa	48%	71%	60%
Nevada	Insufficient Data	Insufficient Data	63%
Orange	68%	83%	74%
Placer	68%	87%	78%
Riverside	61%	79%	67%
Sacramento	64%	79%	73%
San Benito	Insufficient Data	Insufficient Data	63%
San Bernardino	61%	82%	68%
San Diego	66%	83%	77%
San Francisco	55%	70%	64%
San Joaquin	62%	80%	72%
San Luis Obispo	59%	78%	70%
San Mateo	63%	76%	72%
Santa Barbara	60%	81%	72%
Santa Clara	68%	79%	74%
Santa Cruz	55%	87%	72%
Shasta	Insufficient Data	Insufficient Data	77%
Solano	55%	89%	66%
Sonoma	59%	87%	72%
Stanislaus	55%	86%	71%
Tulare	Insufficient Data	Insufficient Data	70%
Ventura	68%	83%	75%
Yolo	65%	88%	77%

*Counties with insufficient data to calculate the combined BEV, PHEV and FCEV participation rate (column 4) have been omitted from Appendix B.