

# Characterizing California Electric Vehicle Consumer Segments

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## Introduction

### Overview

In order to expand the frontiers of the electric vehicle (EV) market into the mainstream, this inquiry aims to identify and profile consumer market segments that are effective targets for supportive resources, such as information and incentives:

- 1 "Rebate Essentials" – those consumers highly influenced by rebates
- 2 "Converts" – EV adopters who had a low initial interest in EVs

Characteristics examined: transaction, household, demographics, motivations and experience with EVs.

Consumers of all-battery and plug-in hybrid EVs are examined separately to allow for important differences in those two products.

### How can consumer research help us grow markets for electric vehicles?

#### "Adding fuel to the fire"

(understand existing, generally enthusiastic adopters to target similar consumers)

- Characteristics and psychographics
- Who is "pre-adapted" to adopt? (e.g., Williams and Kurani 2006)
- Segment: all-battery vs. plug-in hybrid EVs

#### "Tough market nuts to crack"

(understand and break down barriers faced by consumers targeted based on policy priorities)

- Multi-unit dwellings
- Disadvantaged communities
- Low-to-moderate income consumers

#### "Expand market frontiers"

(understand the margins of the market to target consumers who can be induced to join)

- Adopters most influenced by incentives – "rebate essentials"
- Adopters with low initial interest in EVs – "converts"

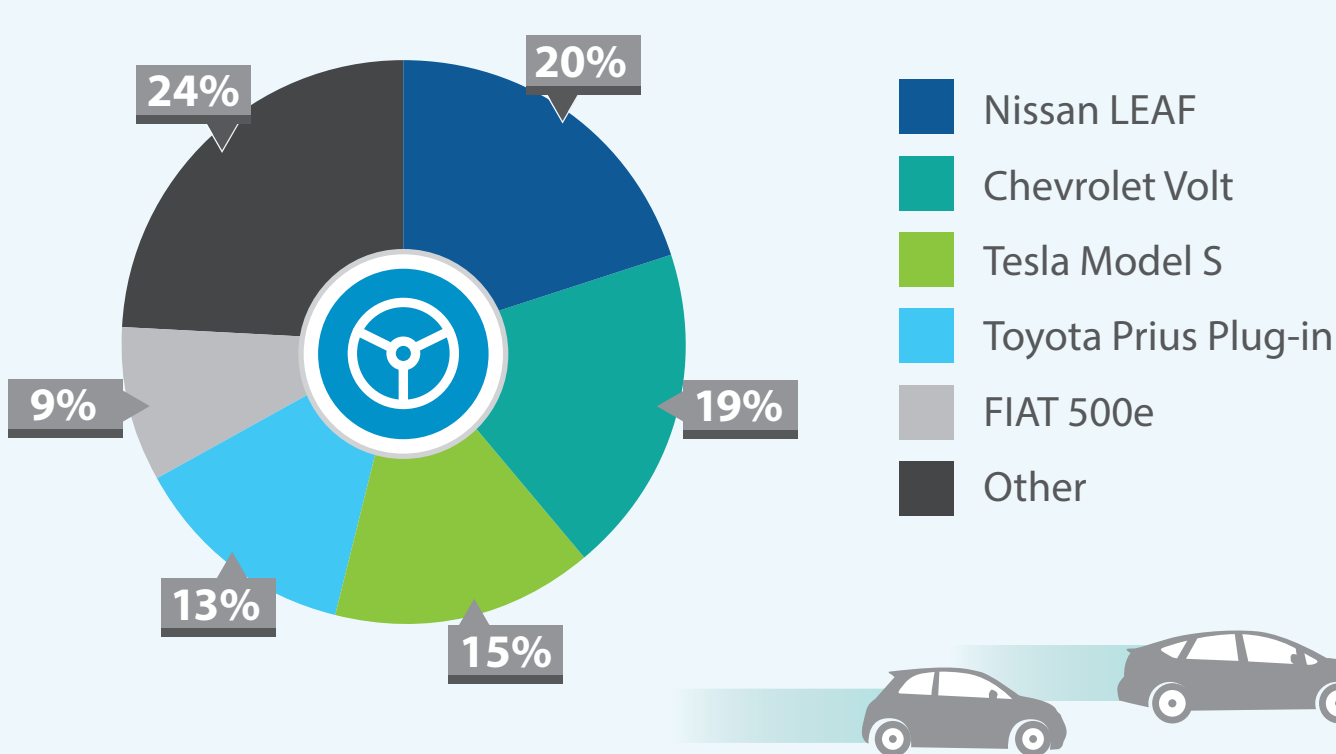
### Methodology

	Rebate Essentials	Converts
<b>Objective</b>	Identify characteristics associated with:	
	Increased rebate influence	Initial interest in adopting
<b>Strategic Purpose</b>	Informs targeting resources at:	
	Consumers who otherwise would not adopt	Non-enthusiasts
<b>Model</b>	Binary logistic	
	Ordered logistic	
<b>Outcome variable:</b>	"Would you have purchased or leased your PEV without the CVRP rebate?" [yes, no]	"Which of the following statements best describes your interest in a PEV when you started your search for a new vehicle?" [scale ranging from only interested in a PEV to didn't know PEVs existed]
<b>Predictor variables:</b>	Consumer, household, vehicle and transactional data reduced based on lack of theoretical relevance, "actionability," and to a lesser extent, correlations	
<b>Data</b>	1a. PHEV (n=7,711)	1b. BEV (n=11,478)
	2a. PHEV (n=7,711)	2b. BEV (n=11,478)

## Data

19,460 individuals responded to the survey

### Vehicles driven by respondents



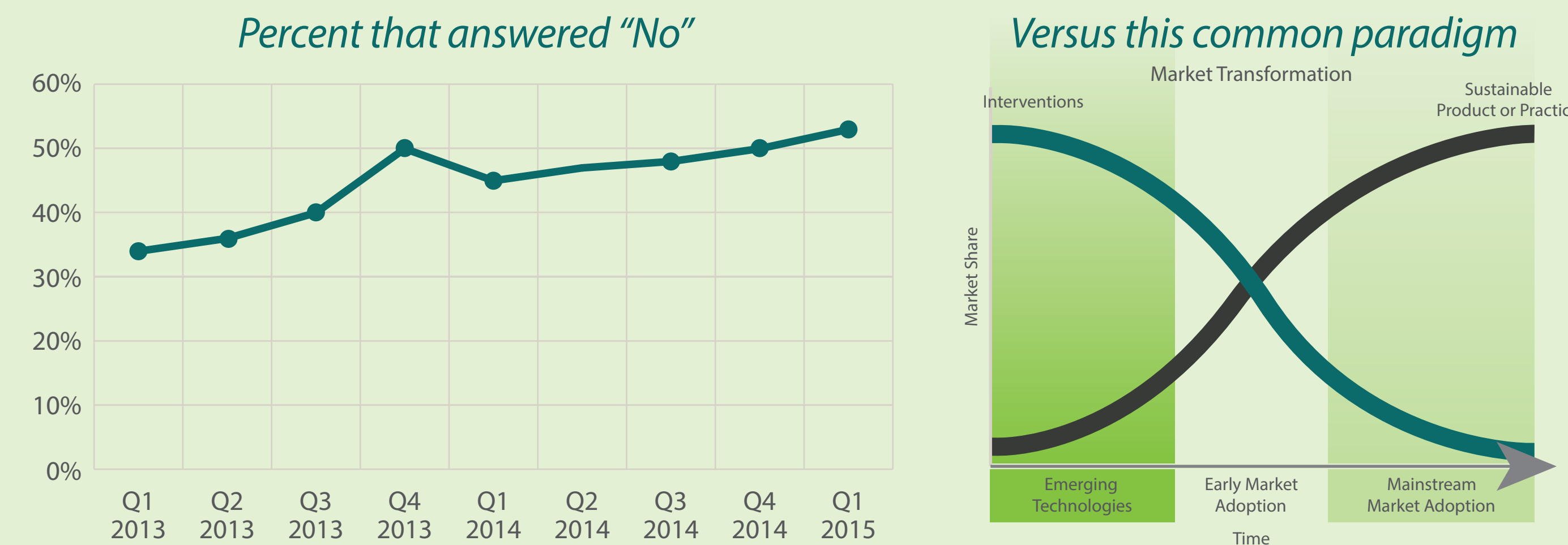
### Majority Characteristics of CVRP Consumers

	CVRP-All (EV Consumer Survey 2014)	New-vehicle "Intenders" (CHS 2014)
40-59 years old	55%	52%
≥ Bachelor's Postgraduate	82%	66%
Male	49%	34%
White/Caucasian	74%	49%
Detached homes	63%	76%
\$50-200k/year household income	80%	75%
	62%	58%

Data sources: CVRP EV Consumer Survey (n=19,460); EV purchase/lease dates 9/2012–5/2015. Weights applied to make responses represent 91,085 program participants along the dimensions of vehicle model, county, and buy vs. lease. Unweighted responses used in logistic regression to produce unbiased and consistent estimates and reduce standard errors.

## Highly Influenced "Rebate Essentials"

### Would you have purchased or leased your EV without the rebate?



### Results: Statistically Significant Odds-Increasing Factors

#### Target Consumers: "Rebate Essentials"

Consumers most influenced by the rebate:

**Demographics:** male, non-white, higher education, lower household income, perhaps younger and larger households

**Motivations and interest:** less motivated by environmental impacts, more motivated by saving money on fuel, carpool lane access, and perhaps energy independence; lower initial interest in EVs

**Information gathering:** found it more difficult to find info on EVs, spent more time researching online, learned about the rebate before going to the dealer

**Vehicle characteristics:** lower price, bought (vs. lease)

#### Differences – PHEV Consumers

The odds are higher for PHEV consumers that are younger, more motivated by energy independence and buying rather than leasing.

#### Differences – BEV Consumers

The odds are higher for BEV consumers in larger households and MUDs, with no solar or workplace charging, and living in central California.

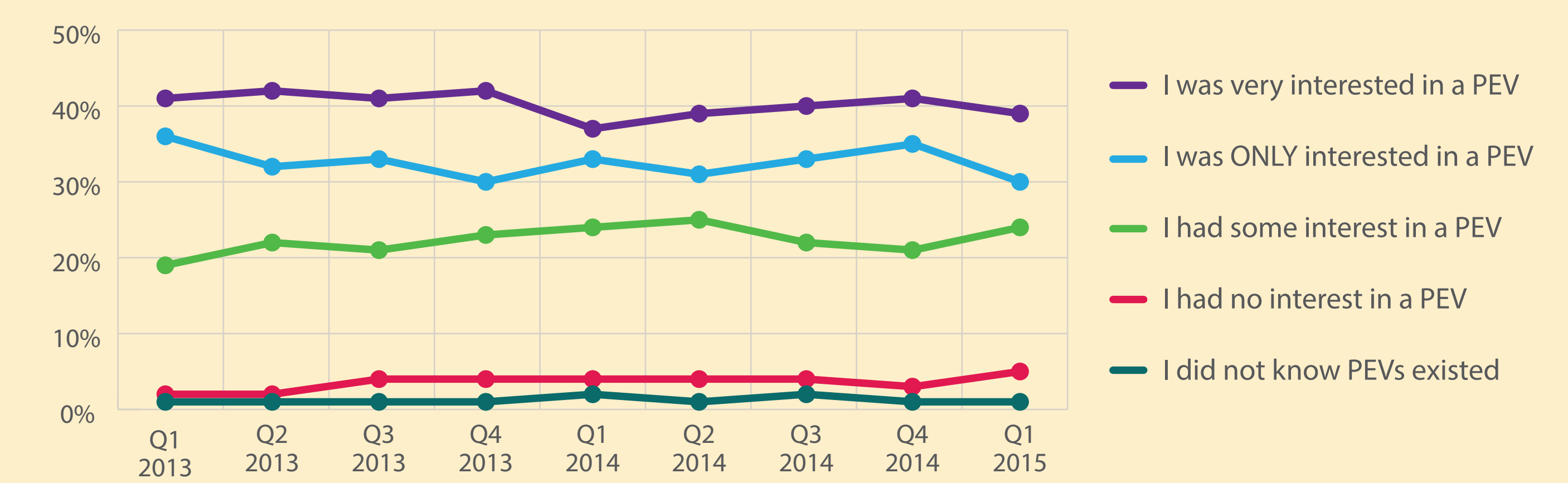
### The rebate is more essential to consumers:

- Focused on "financial and practical" aspects of adoption
- Who face "greater contextual constraints" or are otherwise less easily able to adopt
- Whose adoption is driven less by "green enthusiasm"
- With "challenging informational environments"

Visit the following interactive dashboards for more data and information: cleanvehiclerebate.org, mor-ev.org, ct.gov/deep and zevfacts.com

## Low Initial Interest "Converts"

### Which of the following statements best describes your interest in a PEV when you started your search for a new vehicle?



#### Target Consumers: Low-Interest "Converts"

Consumers most influenced by the rebate:

**Demographics:** non-white, perhaps larger households

**Motivations and interest:** less motivated by environmental impacts, more motivated by saving money on fuel and perhaps vehicle performance, less by carpool lane access and less by energy independence; more rebate essential

**Information gathering:** found it more difficult to find info on EVs, spent less time researching online, learned about the rebate at the dealer

**Vehicle characteristics:** perhaps higher price; leasing (vs. buy), first EV, replacing a vehicle

#### Differences from Rebate Essentials

In contrast to Rebate Essentials, the odds of being a Convert are increased for consumers that are less motivated by carpool lane access and energy independence, who spent less time researching EVs, and who found out about the rebate at the dealership (PHEV consumers).

#### Common Across All Segments

The odds of being in all four of the target segments are increased for consumers that are other than white, more motivated by fuel cost savings and less by environmental impacts, and who found it more difficult to find info on EVs.

### The convert is more likely:

- Less demographically specific/constrained
- Driven less by "energy and the environment" than traditional vehicle-operation reasons
- With "challenging informational environments"
- "Switching from old to new"

Thanks also to Tim Kleinheider, Georgina Arreola, Colin Santulli and others at CSE.