

EV Consumer Characteristics, Awareness, Information Channels & Motivations

EV Roadmap 9, 20 July 2016, Portland OR

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Thanks also to John Anderson, Anna Miller, Georgina Arreola, Colin Santulli, and others at CSE



Center for
Sustainable Energy™

Outline

- Background: CSE & Market Transparency Tools
- Who is adopting?
 - EV Consumer Data
- How are current consumers becoming aware?
 - Information Channels & Time Researching
- What messages are resonating?
 - Purchase Motivations (& Legitimacy)
- Summary & Parting Thoughts



Background

CSE & Market Transparency Tools

CSE's Plug-In & Fuel-Cell Electric Vehicle (EV) Activities



CLEAN VEHICLE REBATE PROJECT™

MOR-EV
Massachusetts Offers Rebates for Electric Vehicles

CHEAPR
Connecticut Hydrogen and Electric Automobile Purchase Rebate

Incentives Design & Administration



Plug-in Electric Vehicle Benefits

Elements of Eligibility for CVRP:

- 1 Individual, business, nonprofit or government entity based in California or has a California-based affiliate
- 2 Purchase or lease a NEW eligible vehicle
- 3 Own/lease the vehicle for at least 30 consecutive months (including CA DMV registration)
- 4 Apply for rebate within 18 months of vehicle purchase or lease date

Consumer & Dealer Outreach



California Environmental Protection Agency
Air Resources Board

CALIFORNIA
PLUG-IN ELECTRIC VEHICLE COLLABORATIVE

Stakeholder Engagement



GREEN FLEET ACTION PLAN
A-F 2013

INTEGRATION
COUNTY OF SAN DIEGO
DEPARTMENT OF GENERAL SERVICES

MARKET ASSESSMENT FOR
ALTERNATIVE FUEL VEHICLE TRAINING IN CALIFORNIA
November 2011

Fleet Assistance & Clean Cities



Logo of the University of California, San Diego

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



Secondary Use Applications of Plug-in Electric Vehicle Lithium-Ion Batteries

2nd Life Battery Research & Vehicle-Grid Integration

CSE has processed >156k rebates totaling >\$333M

California (CVRP), 2010–present

- **Air Resources Board**
- 2007 Legislation (AB118, then AB8) allowing vehicle registration fees
- Greenhouse Gas Reduction Fund



Massachusetts (MOR-EV), 2014–present

- **Department of Energy Resources**
- Regional Greenhouse Gas Initiative



Connecticut (CHEAPR), 2015–present

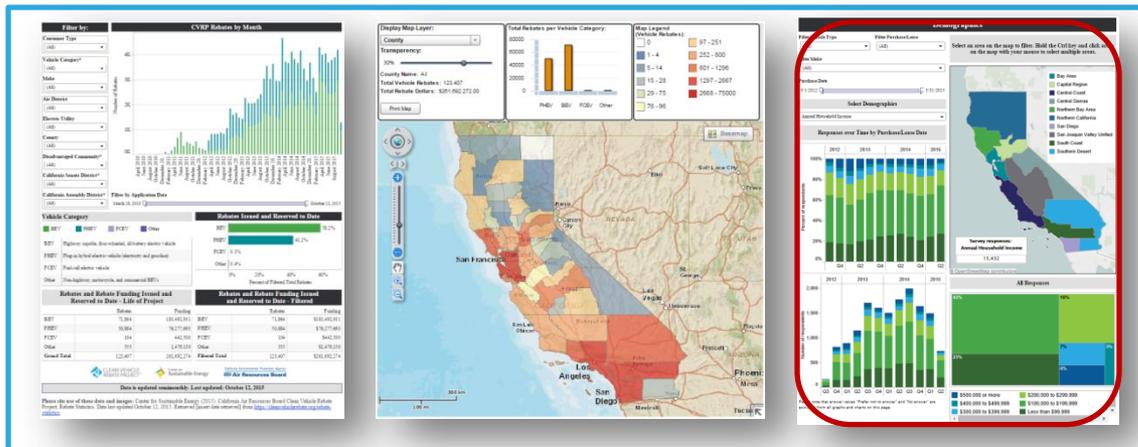
- **Department of Energy & Environmental Protection**
- Utility Settlement
- Vehicle rebate *and* dealer incentive (consumer can also assign vehicle rebate to dealer)



Where can I get the data?: CSE Transparency Tools

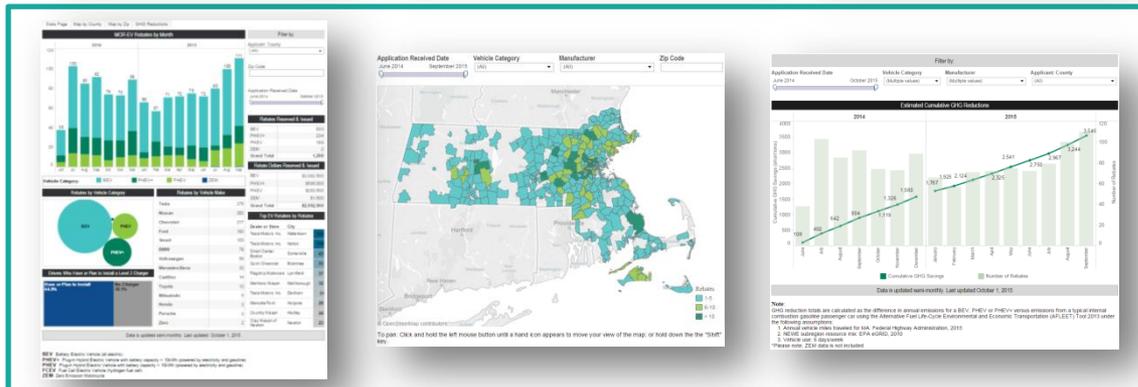
- Public, online, interactive dashboards facilitate informed action
- Up-to-date rebate-application and participant-survey data
 - Characterize >150,000 EVs and consumers

zevfacts.com

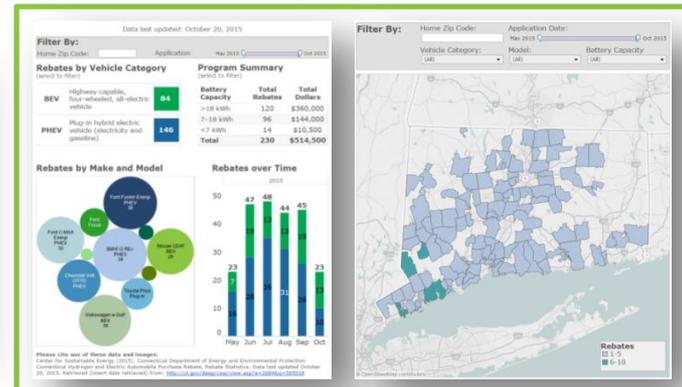


cleanvehiclerebate.org

ct.gov/deep



mor-ev.org





Who is adopting?

Rebated EV Consumers

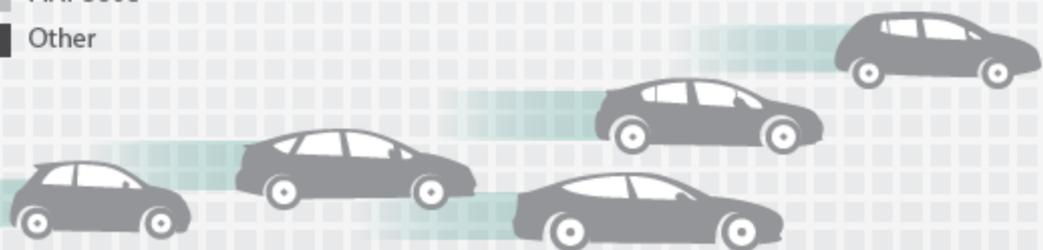
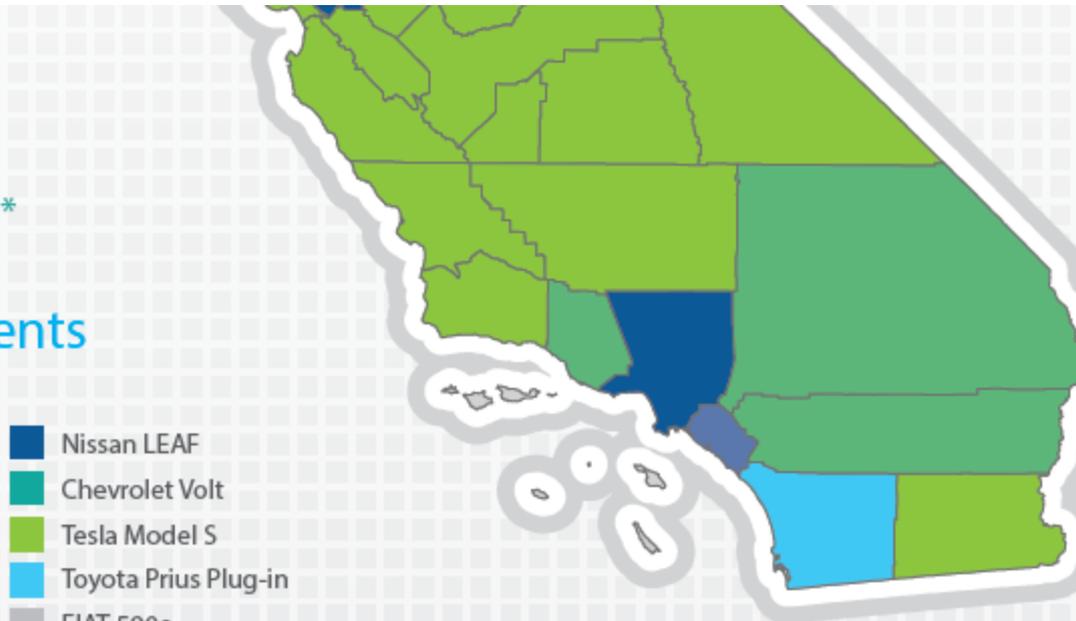
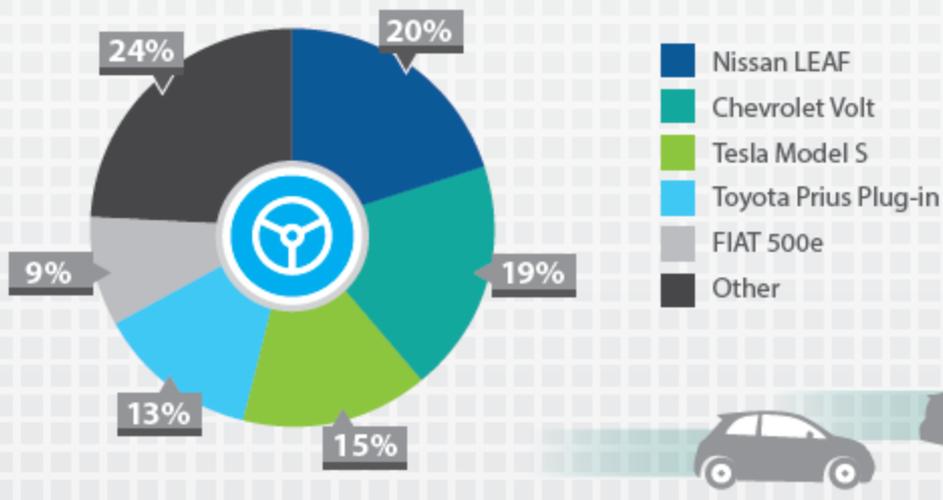
EV Consumer Survey (CVRP vehicles acquired 9/1/12 - 6/17/15)

Survey sample

19,460

individuals responded to the survey**

Vehicles driven by respondents



* Through May 2015, 150,287 new PEVs were adopted in California, 75,748 PHEVs and 74,539 BEVs.

** Results have been weighted to be representative of the entire program with respect to county, vehicle model and whether the vehicle was purchased or leased.

Majority Characteristics of CVRP Consumers

| | CVRP – overall |
|---|-----------------------|
| 40–59 years old | 56% |
| Bachelor's Postgraduate | 34% 49% |
| Male | 75% |
| White/Caucasian | 64% |
| Detached homes | 81% |
| \$50–200k/y household income | 61% |

Source: EV Consumer Survey
Respondents: 19,460
Purchase dates 9/1/12-5/31/15
Sampling weights applied

Majority Characteristics of CVRP Consumers

| | CVRP – overall | CVRP – PHEV | CVRP – BEV |
|-------------------------------------|-----------------------|--------------------|-------------------|
| 40–59 years old | 56% | 55% | 56% |
| Bachelor's Postgraduate | 34% 49% | 35% 45% | 34% 52% |
| Male | 75% | 73% | 77% |
| White/Caucasian | 64% | 66% | 63% |
| Detached homes | 81% | 79% | 83% |
| \$50–200k/y household income | 61% | 66% | 58% |

Source: EV Consumer Survey
 Respondents: 19,460
 Purchase dates 9/1/12-5/31/15
 Sampling weights applied

Majority Characteristics of CVRP Consumers

| | CVRP – overall | CVRP – PHEV | CVRP – BEV | CVRP – Low Initial Interest |
|-------------------------------------|-----------------------|--------------------|-------------------|------------------------------------|
| 40–59 years old | 56% | 55% | 56% | 54% |
| Bachelor's Postgraduate | 34% 49% | 35% 45% | 34% 52% | 37% 39% |
| Male | 75% | 73% | 77% | 69% |
| White/Caucasian | 64% | 66% | 63% | 54% |
| Detached homes | 81% | 79% | 83% | 76% |
| \$50–200k/y household income | 61% | 66% | 58% | 65% |

Source: EV Consumer Survey
 Respondents: 19,460
 Purchase dates 9/1/12-5/31/15
 Sampling weights applied

Majority Characteristics of CVRP Consumers

| | CVRP – overall | CVRP – PHEV | CVRP – BEV | CVRP – Low Initial Interest | CVRP – Rebate Essential |
|-------------------------------------|-----------------------|--------------------|-------------------|------------------------------------|--------------------------------|
| 40–59 years old | 56% | 55% | 56% | 54% | 57% |
| Bachelor’s Postgraduate | 34% 49% | 35% 45% | 34% 52% | 37% 39% | 35% 49% |
| Male | 75% | 73% | 77% | 69% | 77% |
| White/Caucasian | 64% | 66% | 63% | 54% | 57% |
| Detached homes | 81% | 79% | 83% | 76% | 79% |
| \$50–200k/y household income | 61% | 66% | 58% | 65% | 67% |

Housing

EV Consumer Survey

(CVRP vehicles acquired 9/1/12 - 6/17/15)

81%



reside in a single-family detached home

9%



reside in a single-family attached home (townhome, duplex, triplex, etc.)

9%



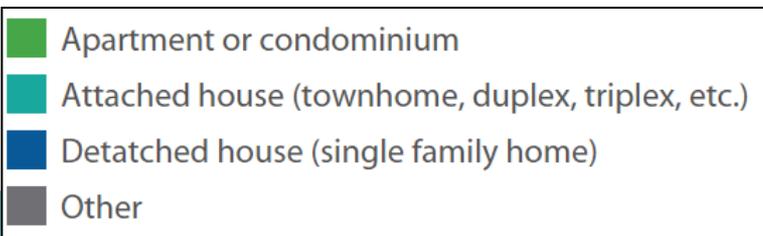
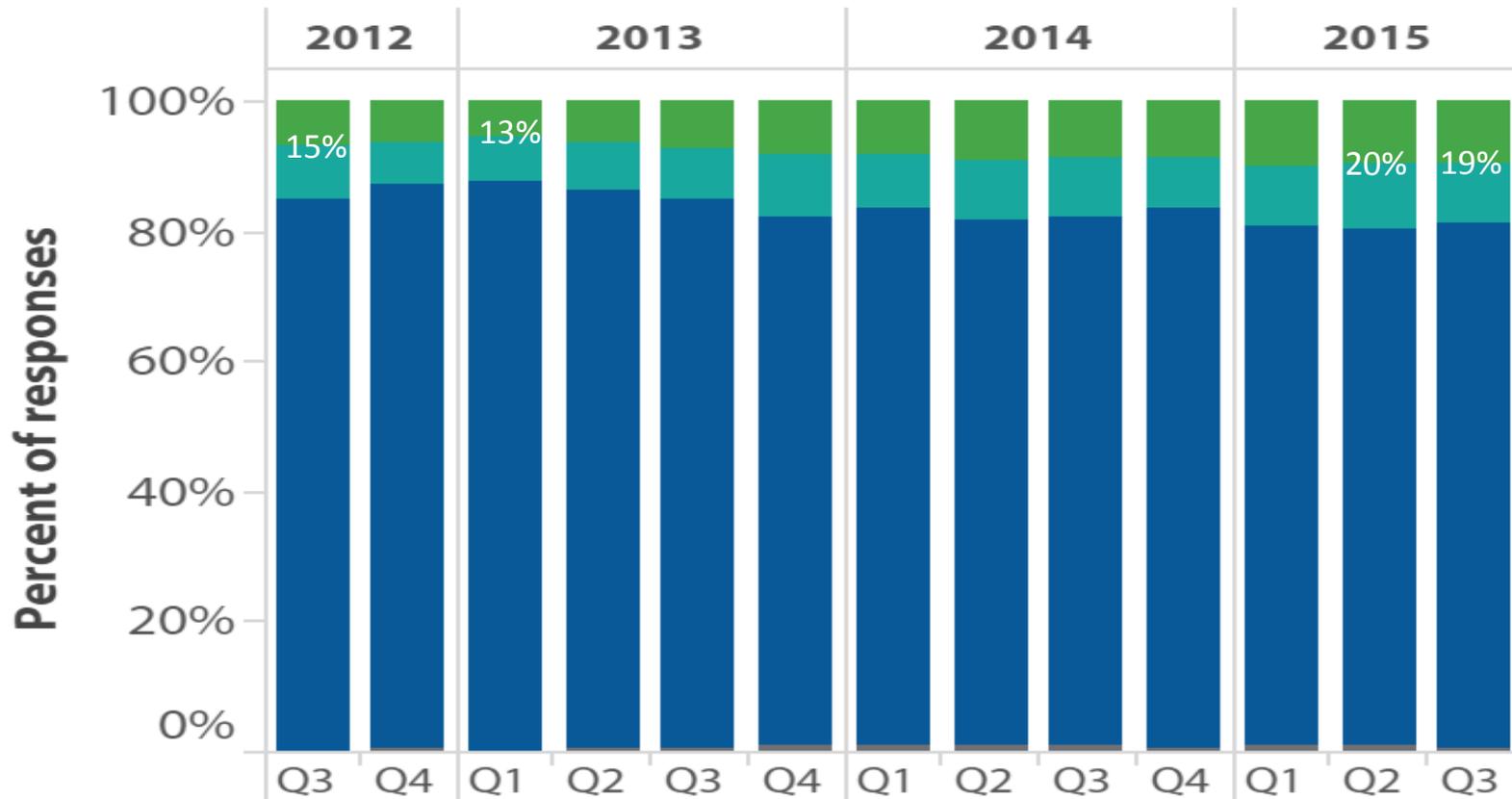
reside in an apartment/condominium

1%



reside in other dwellings

Over Time: Housing Type



Combined EV and CV Surveys

Total Responses: 23,859

Overall Time Frame: 9/1/2012–9/30/2015





How are consumers currently becoming aware?

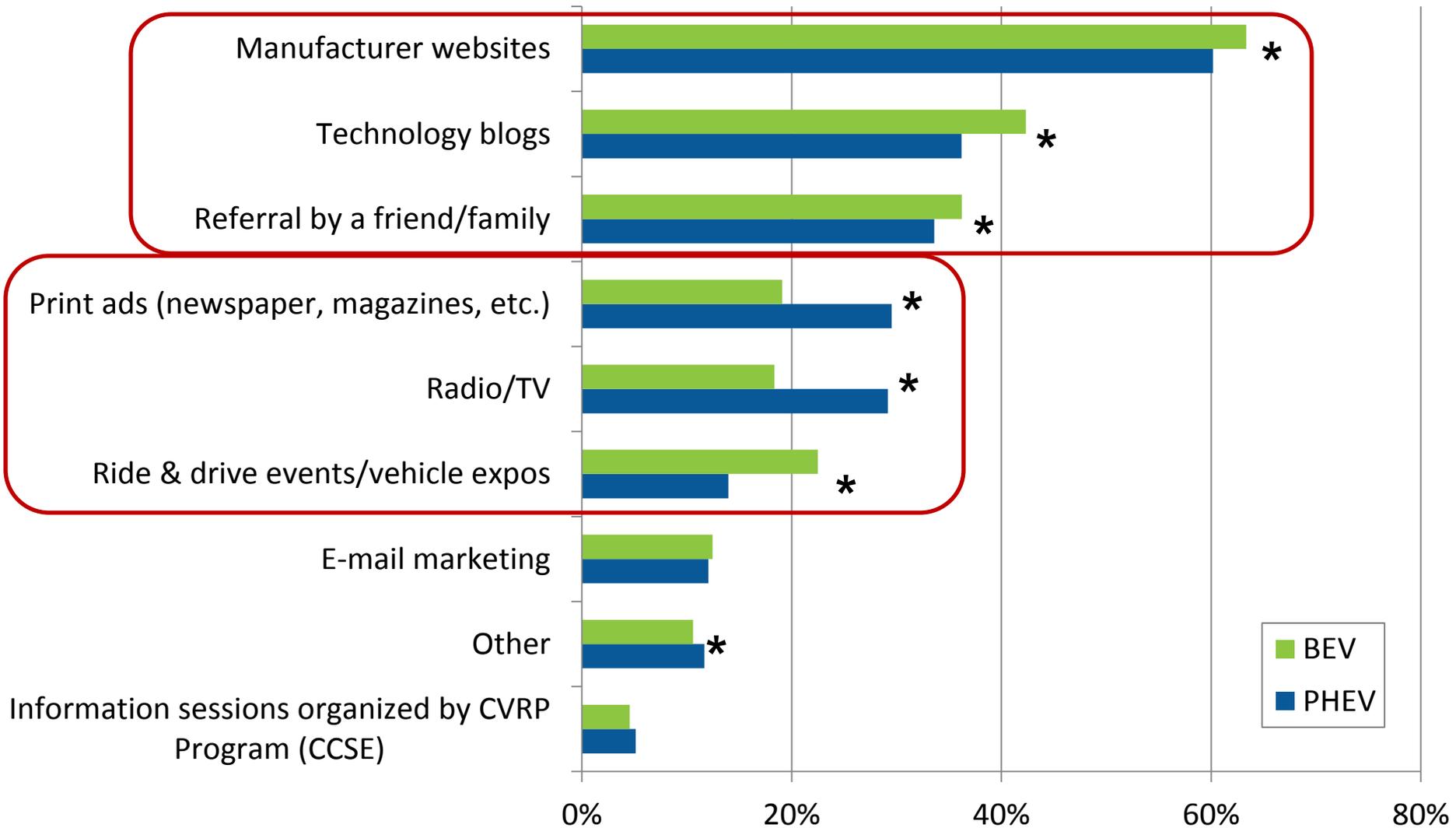
Information Channels



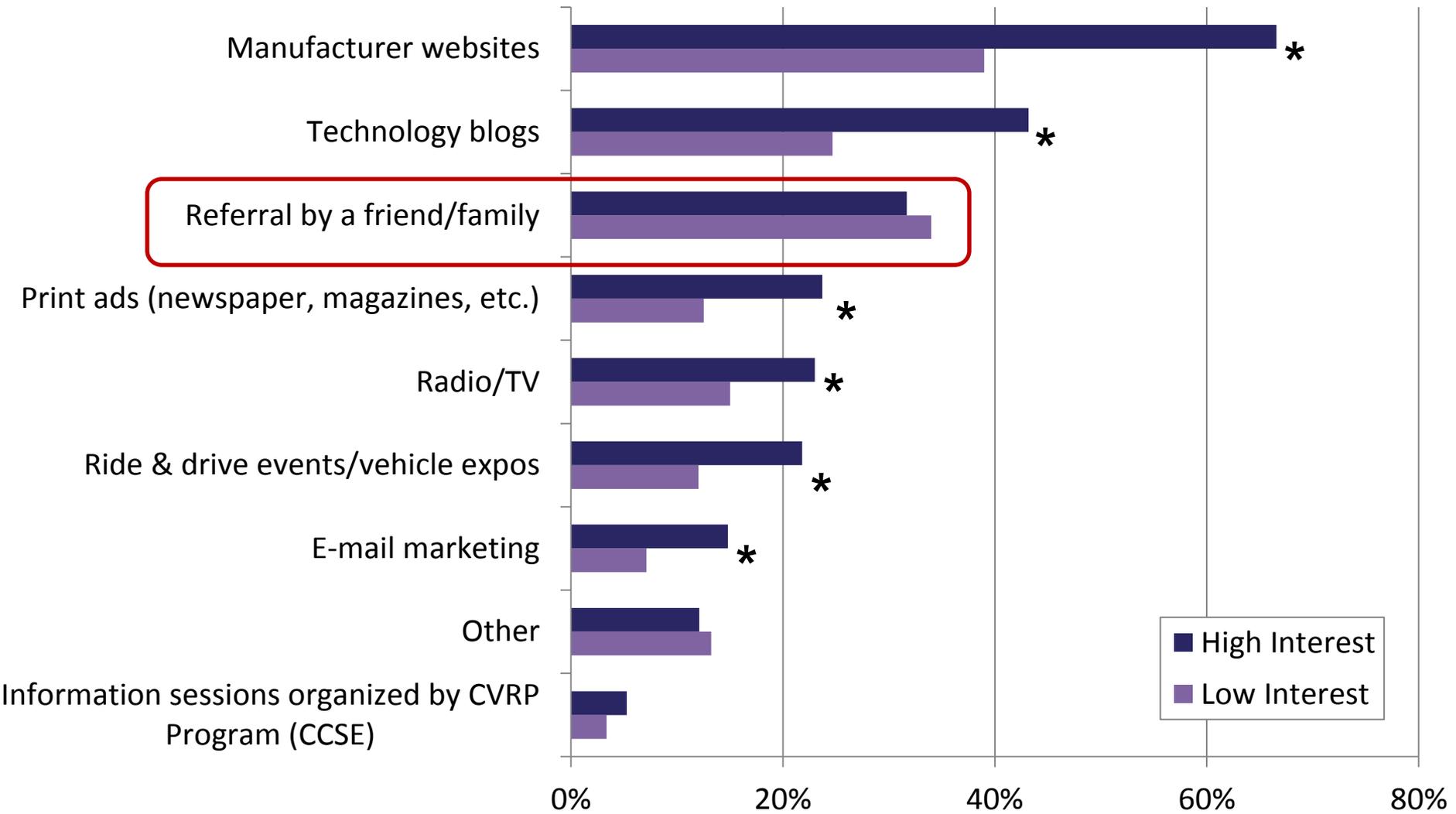
Exposure

Information Channels

What types of PEV marketing/advertising did you encounter before you acquired your PEV? (select all that apply)



What types of PEV marketing/advertising did you encounter before you acquired your PEV? (select all that apply)

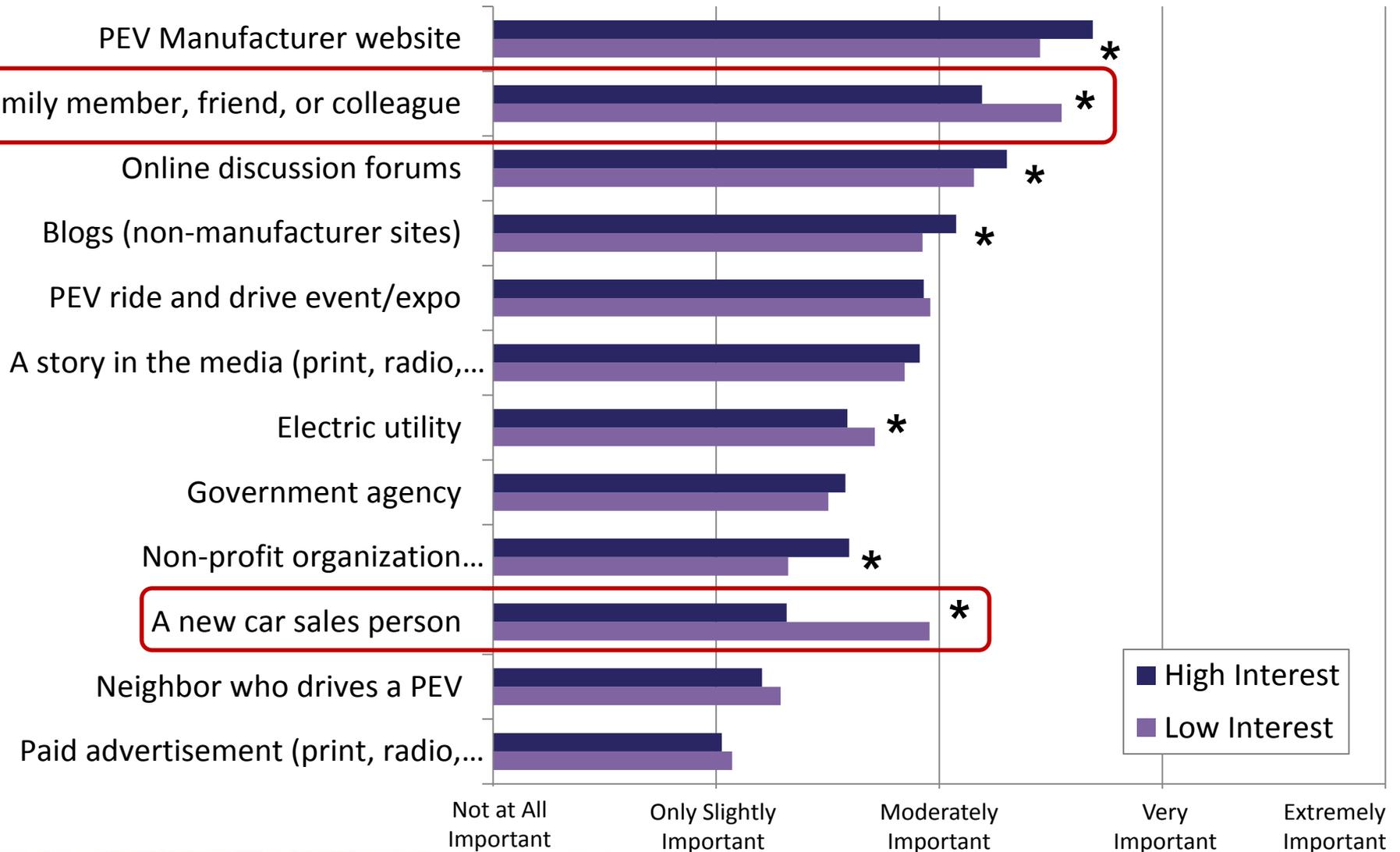




Importance

Informational Channels

How important was information from the following sources in your decision to acquire (purchase/lease) a PEV?



Source: EV Consumer Survey
 Respondents: 18,434
 Purchase dates 9/1/12-5/31/15
 Sampling weights applied

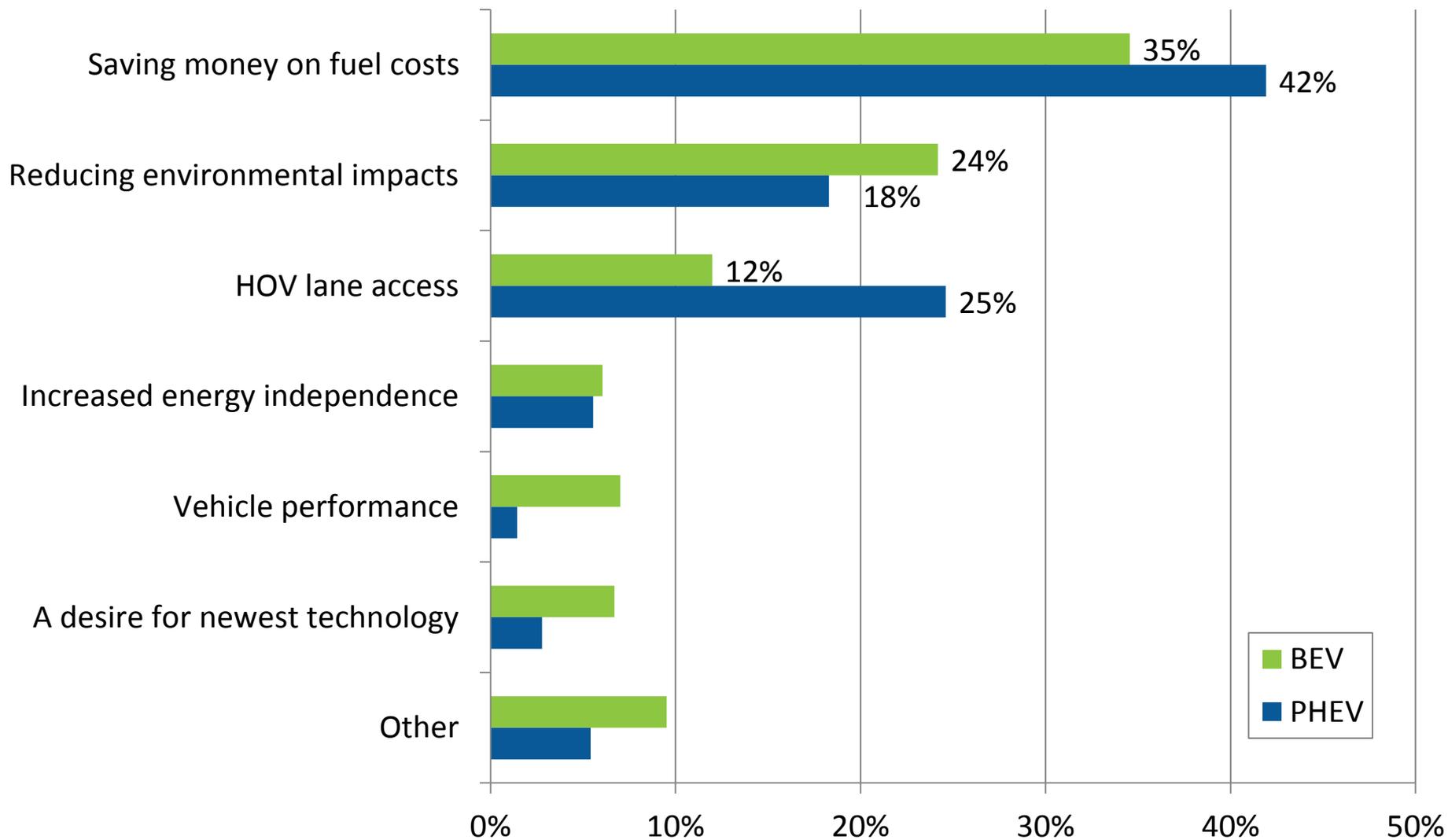
*statistically significant difference



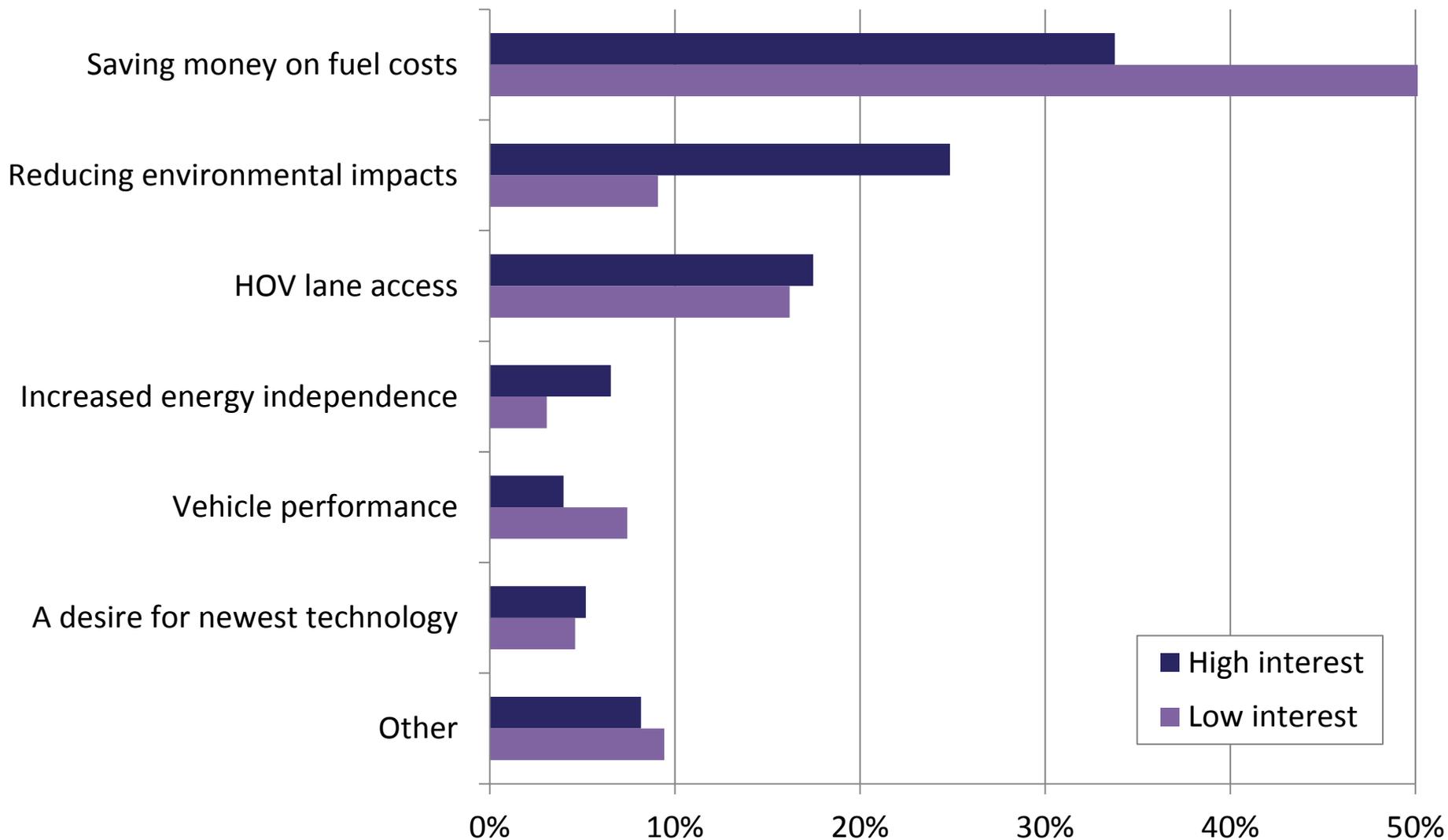
What messages are resonating?

Purchase/Lease Motivations

Most Important Reason Why Decided to Acquire



Most Important Reason Why Decided to Acquire



EV Consumer Survey (CVRP vehicles acquired 9/1/12 - 6/17/15)

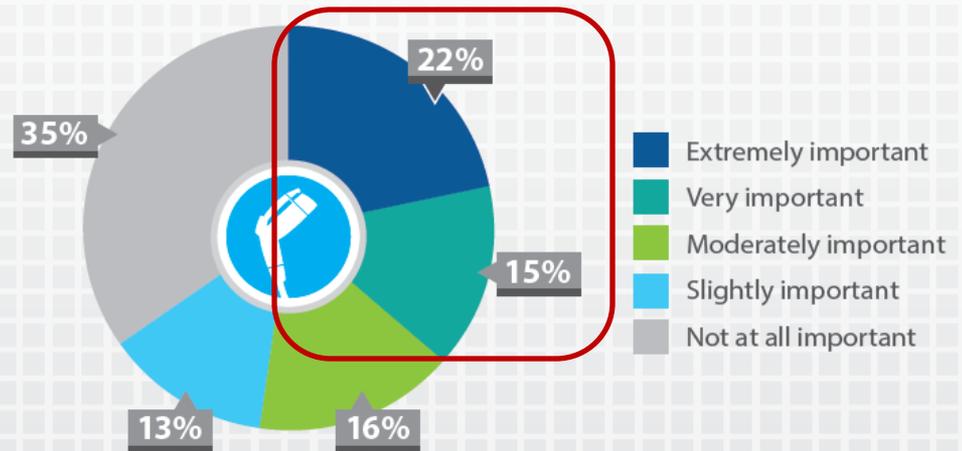
Workplace Charging

44% of commuting PHEV respondents have access to workplace charging

50% of commuting BEV respondents have access to workplace charging

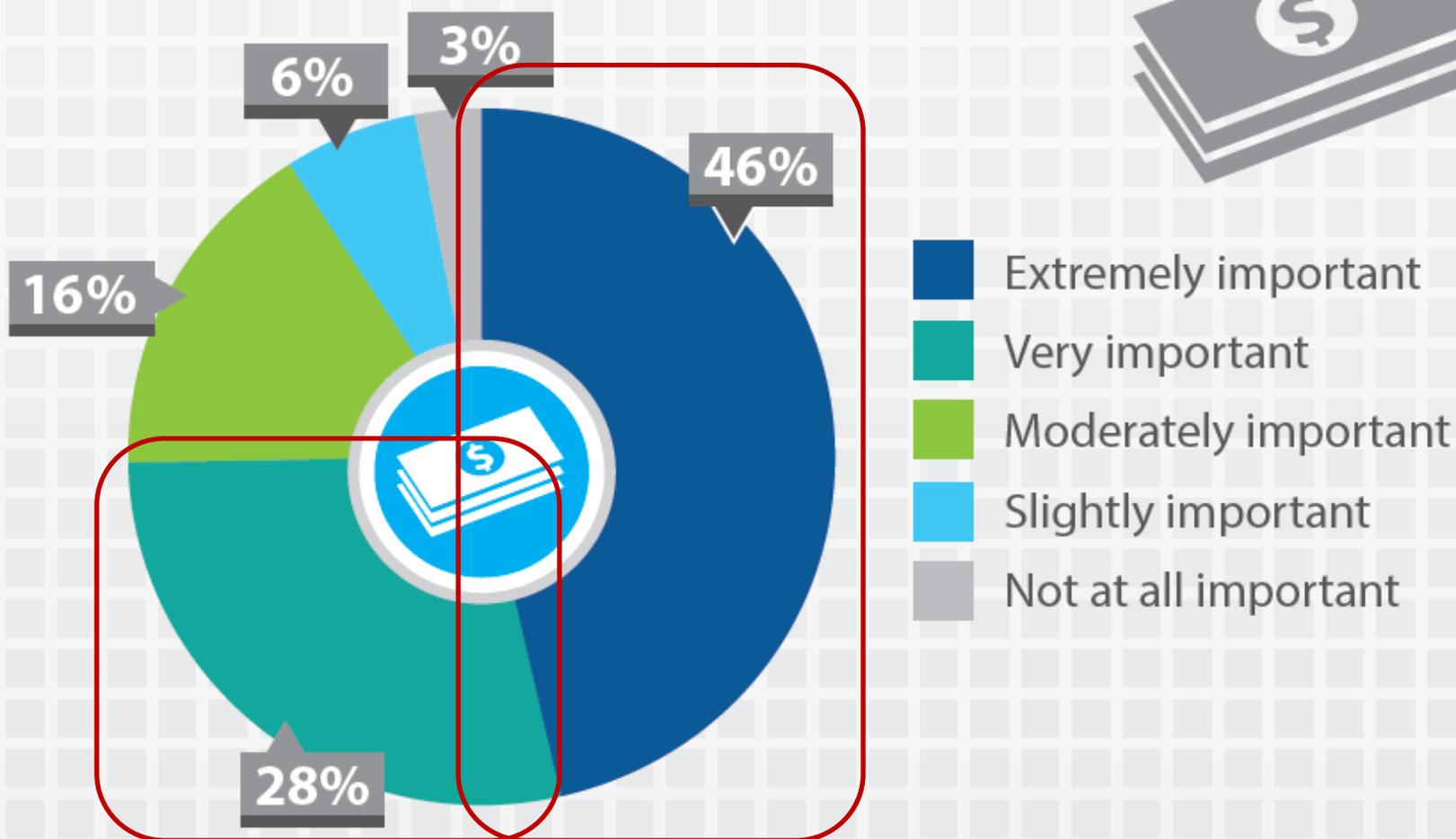


Importance of workplace charging in decision to acquire a PEV



Note: Total does not add to 100% due to rounding.

Importance of CVRP rebates



Note: Total does not add to 100% due to rounding.

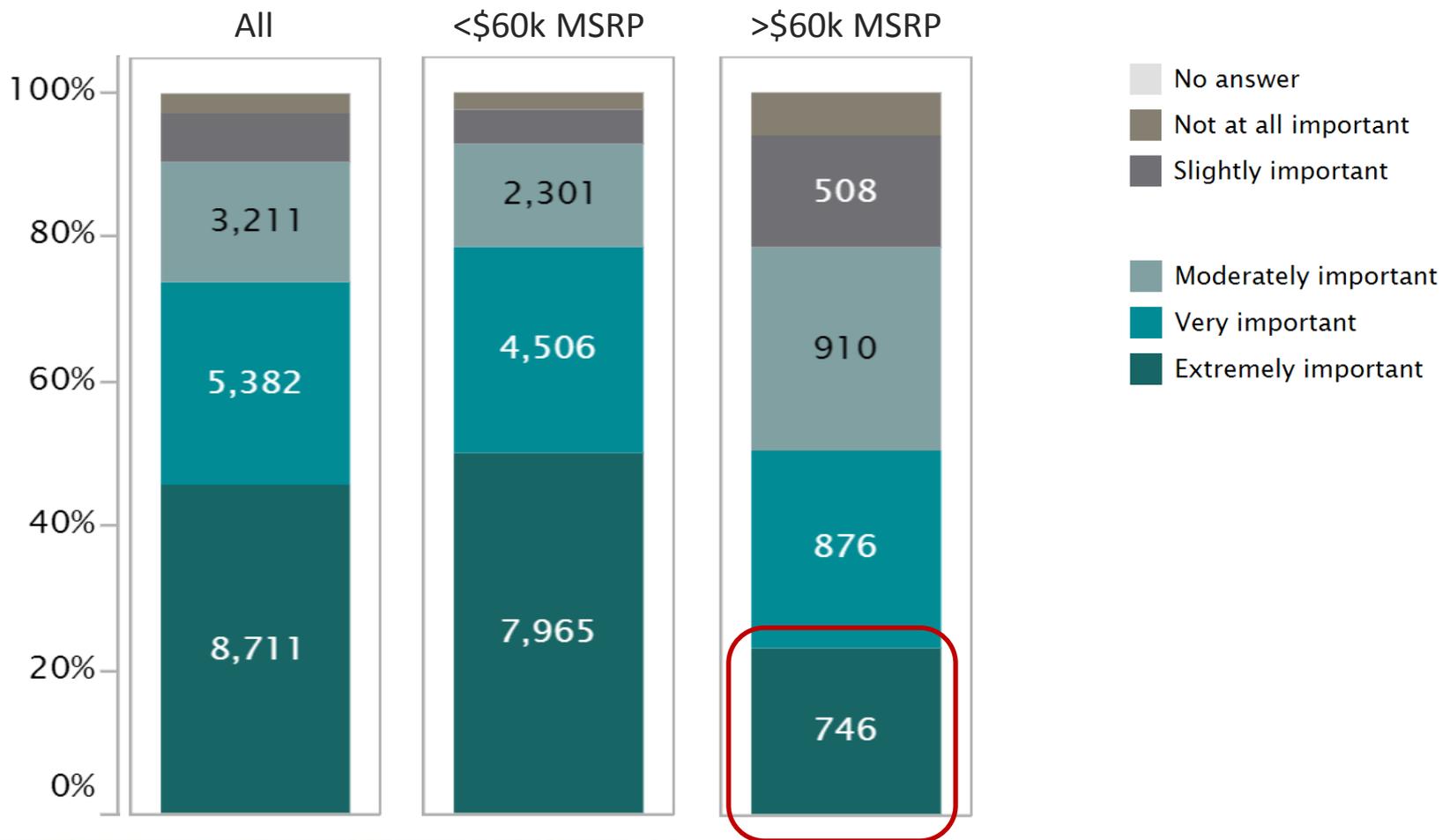
Rebate Influence

Importance of the rebate in making it possible to acquire a PEV.



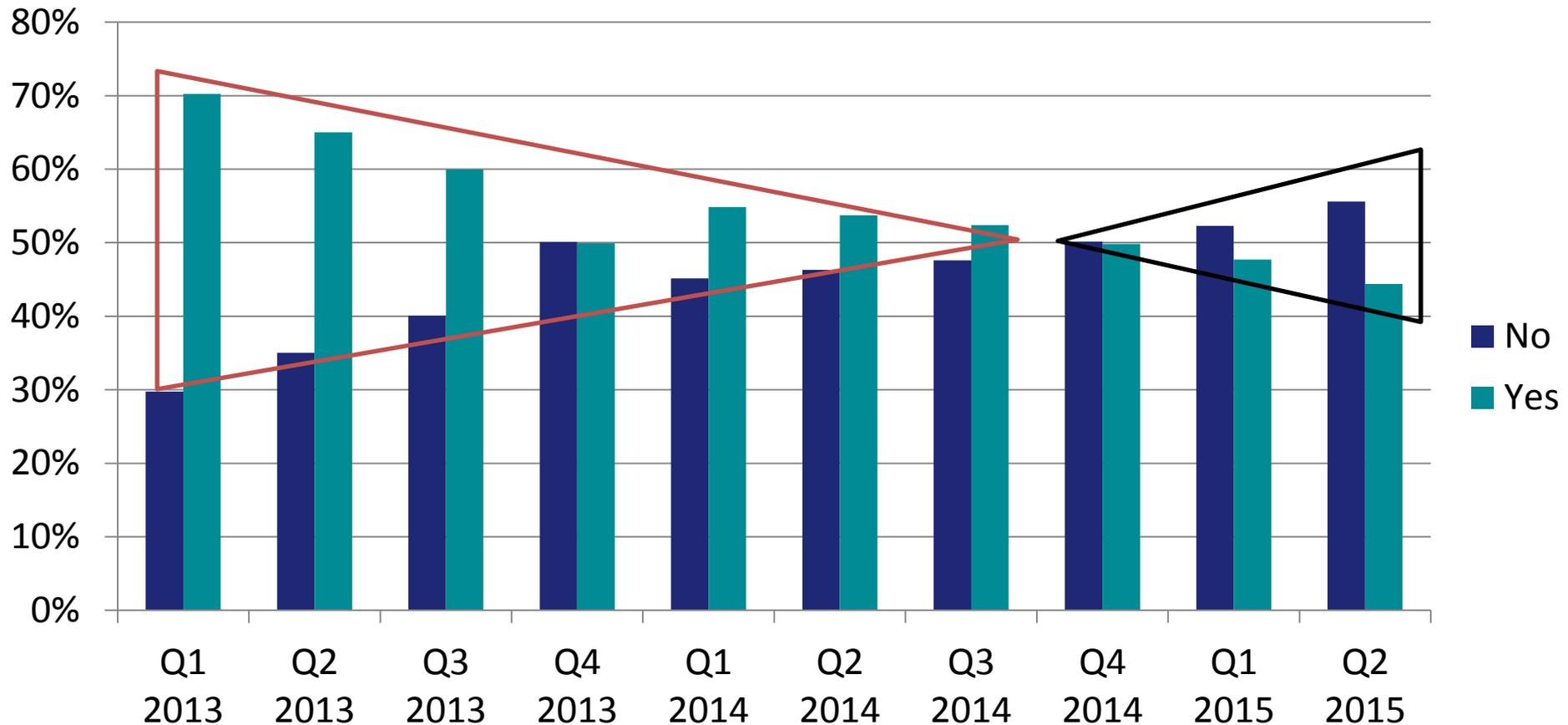
Rebate Influence

Importance of the rebate in making it possible to acquire a PEV.



CVRP Influence on Purchase/Lease is Increasing

Would you have purchased or leased your vehicle without the state vehicle (CVRP) rebate?





Summary & Parting Thoughts

Summary: Overall

- **Demographics:**
 - Still male-dominant, but more ethnically diverse than new-car intenders as a whole.
 - Signs indicate markets are slowly shifting toward more mainstream consumers (female, MUD, <\$100k income)
- **Awareness:** General awareness may be growing, but full understanding lags
- **Exposure:** Manufacturer websites, friends/family, and online blogs/forums are key channels
- **Importance:** Most influential information sources provide first-hand experience or offer qualified “expertise”
- **Motivations:**
 - Fuel cost savings, environment, HOV-lane access
 - Importance of the state monetary incentive is growing

Summary: PHEV consumers (relative to BEV)

- **Demographics:** Somewhat more female, older, multi-unit dwellers, renters, 1-vehicle households replacing a vehicle (vs. adding), lower income
- **Exposure:** Less overall exposure, especially to ride-n-drives; Greater exposure to “passive”/”traditional advertising: print ads and radio/TV
- **Importance:** Value new car sales people and paid advertisements more, ride & drive events less
- **Time researching:** Spend less time on charging, more on costs, warranties, and maintenance
- **Motivations:** Saving money on fuel costs, HOV lane access

Summary: Low-Initial-Interest consumers

- **Demographics:** More female, ethnically diverse
- **Exposure:** Lower exposure to almost all PEV marketing/advertising, especially auto websites and tech blogs—except friends/family
- **Importance:** Value new car sales people and family/friends/colleagues more, manufacturer websites less
- **Time researching:** More time researching costs, warranties, and charging
- **Motivations:** Much more by fuel cost savings, also HOV-lane access, much less environmental

Summary: Rebate-Essential consumers

- **Demographics:** More ethnically diverse, multi-unit dwellers
- **Exposure:** Report greater exposure to manufacturer websites
- **Importance:** Value almost all information sources more
- **Time researching:** Spend more time researching almost all topics
- **Motivations:** Rebate is essential

Summary: Low/Moderate-Income consumers

- **Demographics:** More female, ethnically diverse, multi-unit dwellers; low/moderate income only
- **Exposure:** Lower to most but radio/TV, friends/family
- **Importance:** Value all information sources significantly more
- **Time researching:** Spend more time researching all topics (except costs and incentives)
- **Motivations:**
 - Similar
 - Importance of rebate is significantly higher

Data Sources

Program:

- 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
- Applications (n=110,734)
 - EV purchase/lease dates 3/2010–5/2015

Market:

- EV Registration Data (Polk, N=150,287)
 - EV registration dates 3/2010–5/2015

Thank You

What would you like to know more about?
What decisions are you facing?
brett.williams@energycenter.org

*We work nationally in the clean energy industry and
are always open to exploring partnership opportunities.*

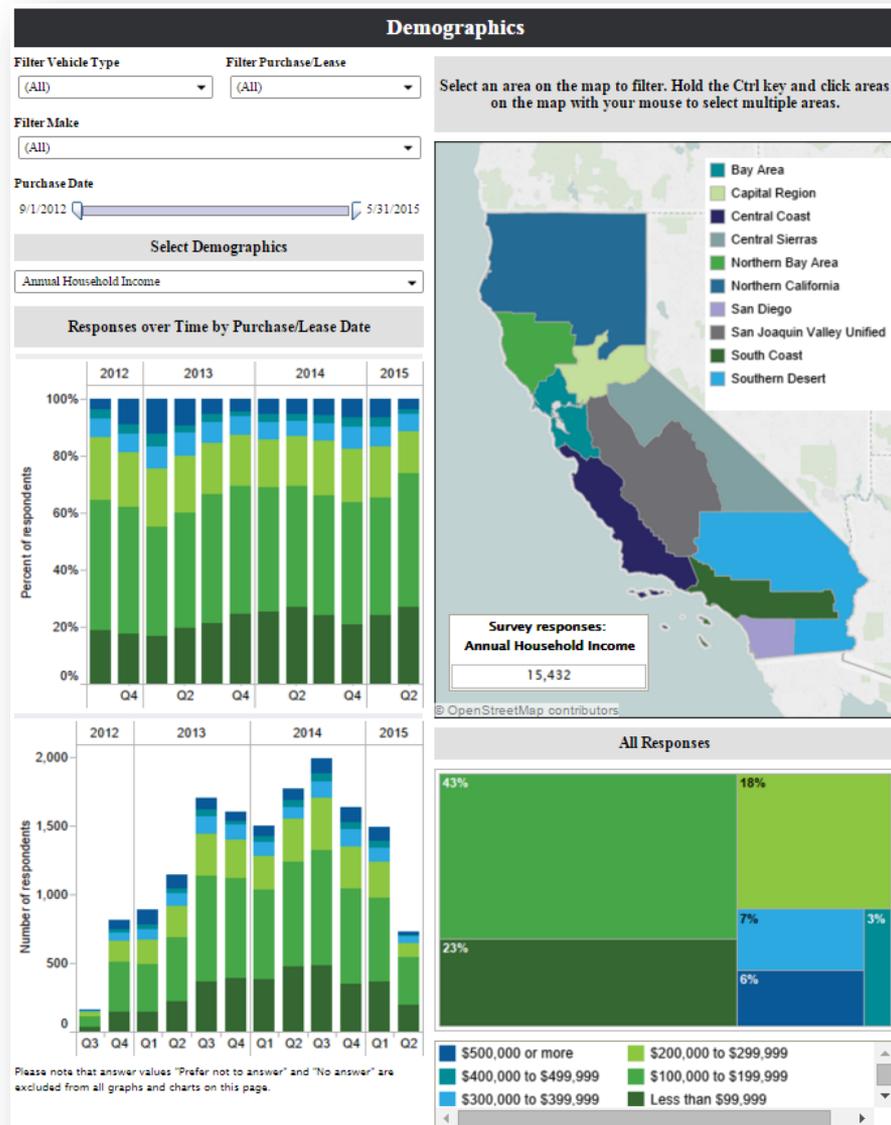


Extra Slides



Where can I get the data?: Consumer Survey Dashboard

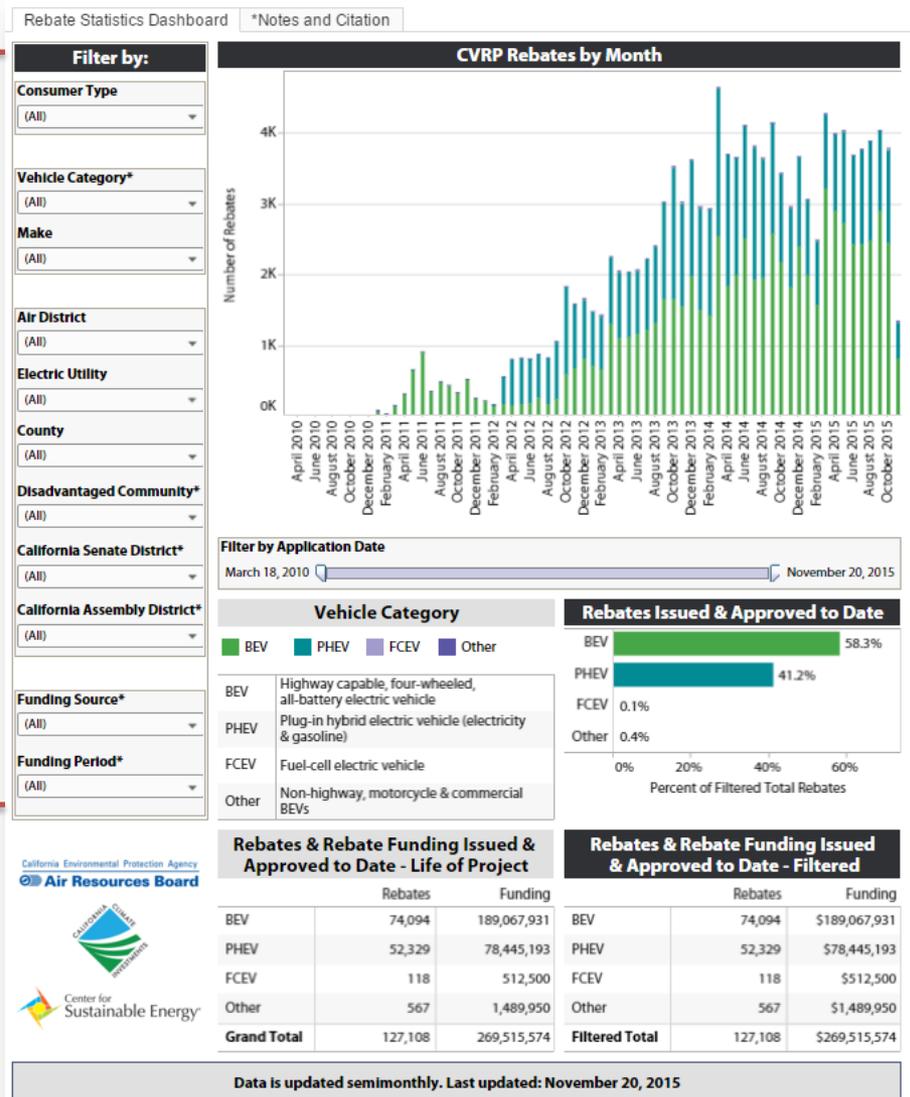
- All rebate recipients invited to take a survey
- >19,000 CVRP responses
- Topics include:
 - Demographics
 - Information channels
 - Purchase motivations and enablers
 - Dealership experience
 - Utility rate awareness
- Filter by: vehicle category, buy/lease, make, region
- Survey results reasonably represent all rebate recipients



Rebate Dashboard: Filters

Filter by:

- Consumer type
- Vehicle category
- Make
- Region:
 - Air district
 - Utility territory
 - County
 - Legislative district
 - Disadvantaged Community status
 - Funding Source
- Application date

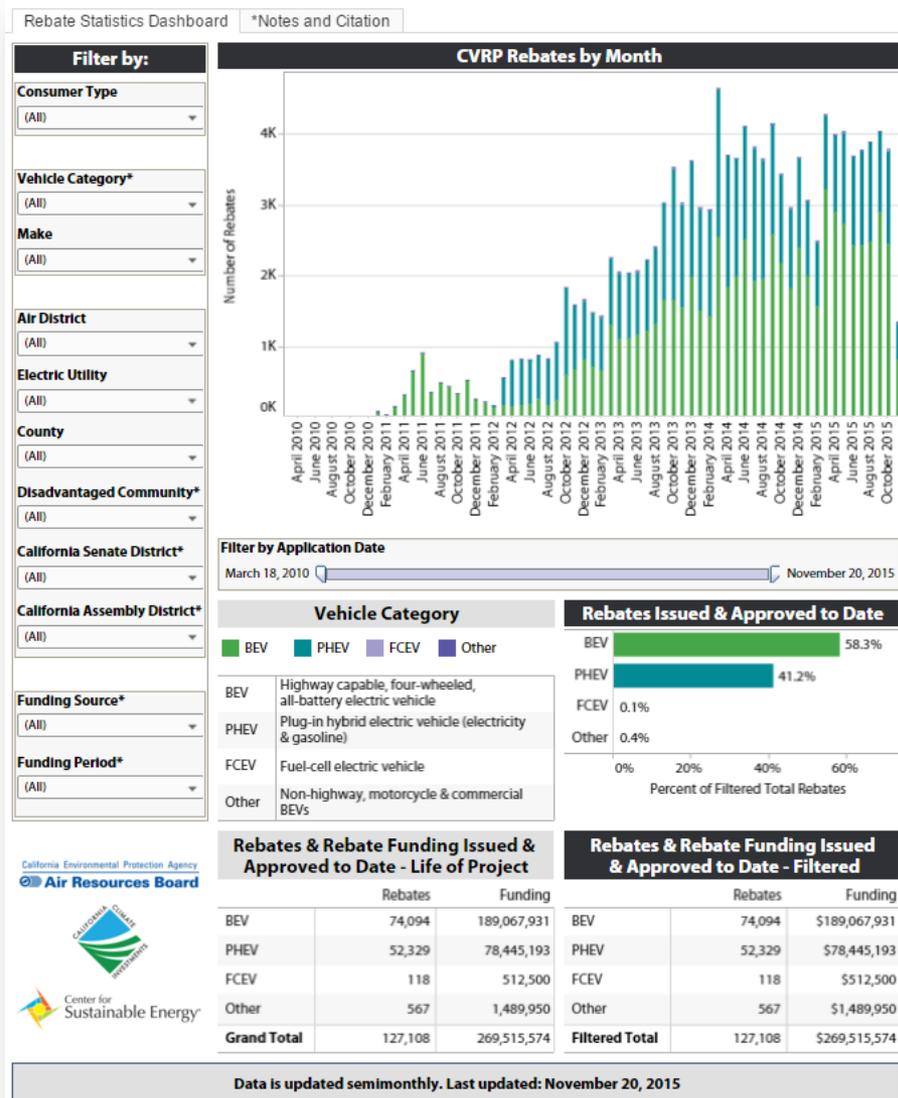


Please cite use of these data and images: Center for Sustainable Energy (2015). California Air Resources Board Clean Vehicle Rebate Project, Rebate Statistics. Data last updated November 20, 2015. Retrieved [insert date retrieved] from <https://cleanvehiclerebate.org/rebate-statistics>

Rebate Dashboard: Results

Results by:

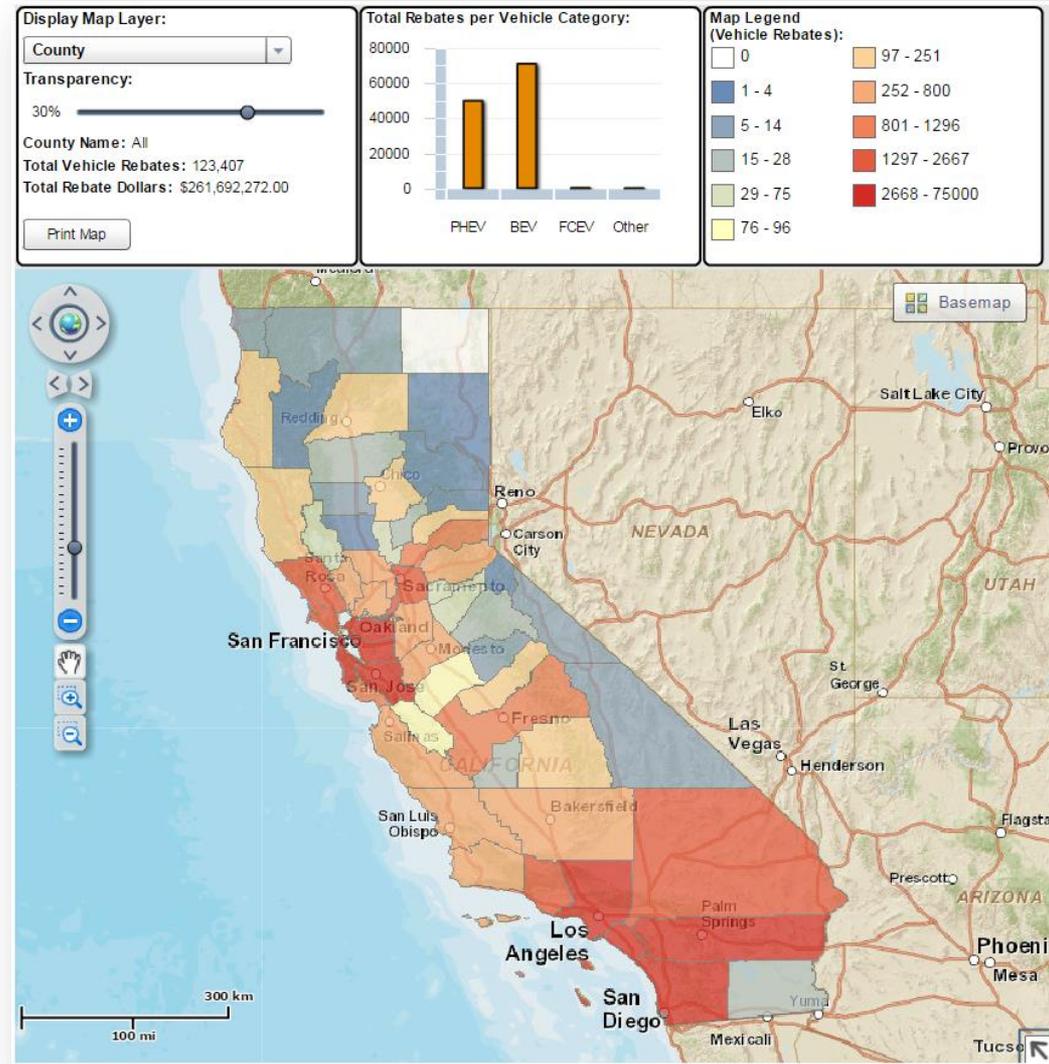
- Rebated vehicles and funds:
 - Life-of-project (grey headings) vs. filtered selection (black)
- Rebated vehicles:
 - By month
 - By vehicle category
 - Filtered totals and %
- Downloads:
 - Images
 - Raw data (incl. Census tract)



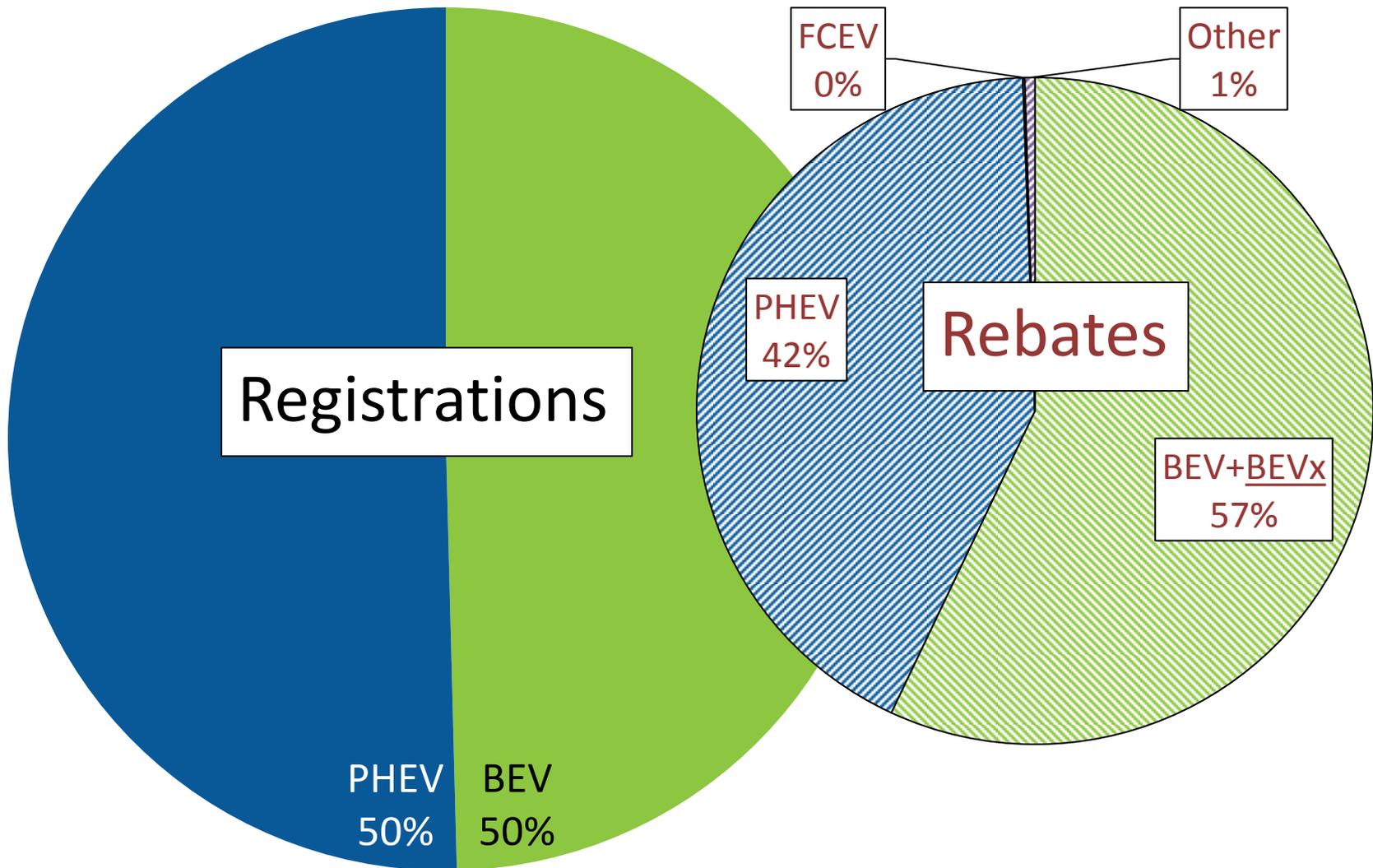
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Rebate Map

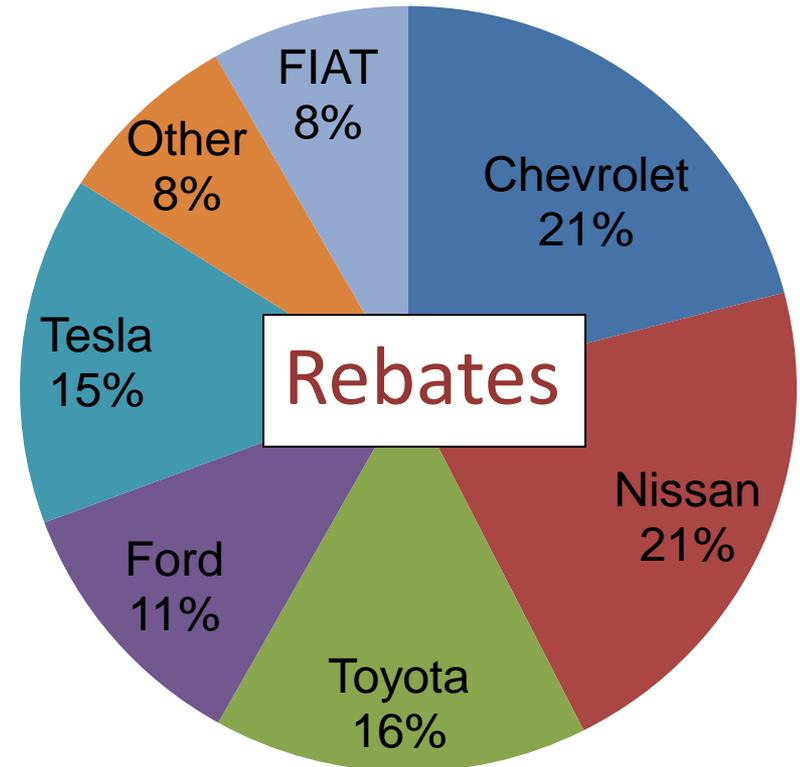
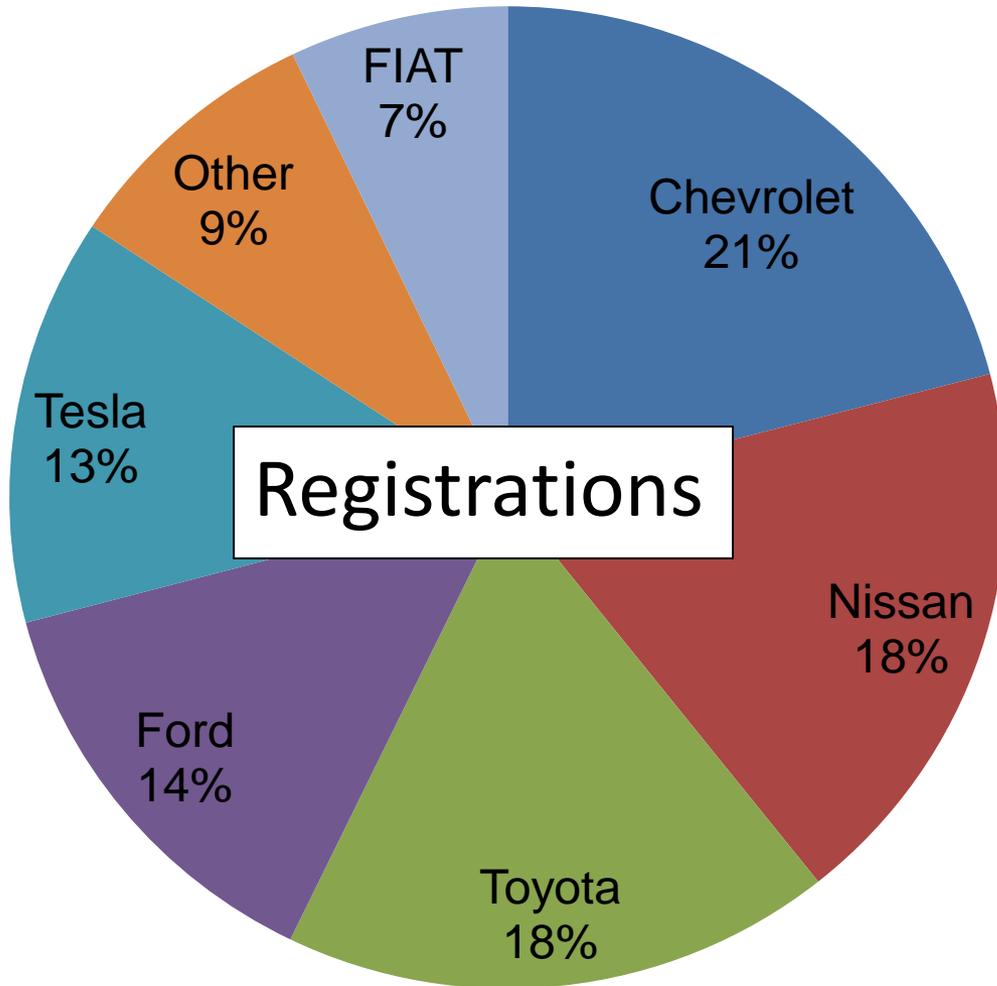
- Rebated vehicles and funds over the life of the project by:
 - County
 - Utility
 - Air District
 - Zip Code (census tract coming soon)
 - State Assembly District
 - State Senate District
- PDF image download



Share by Vehicle Category: CA

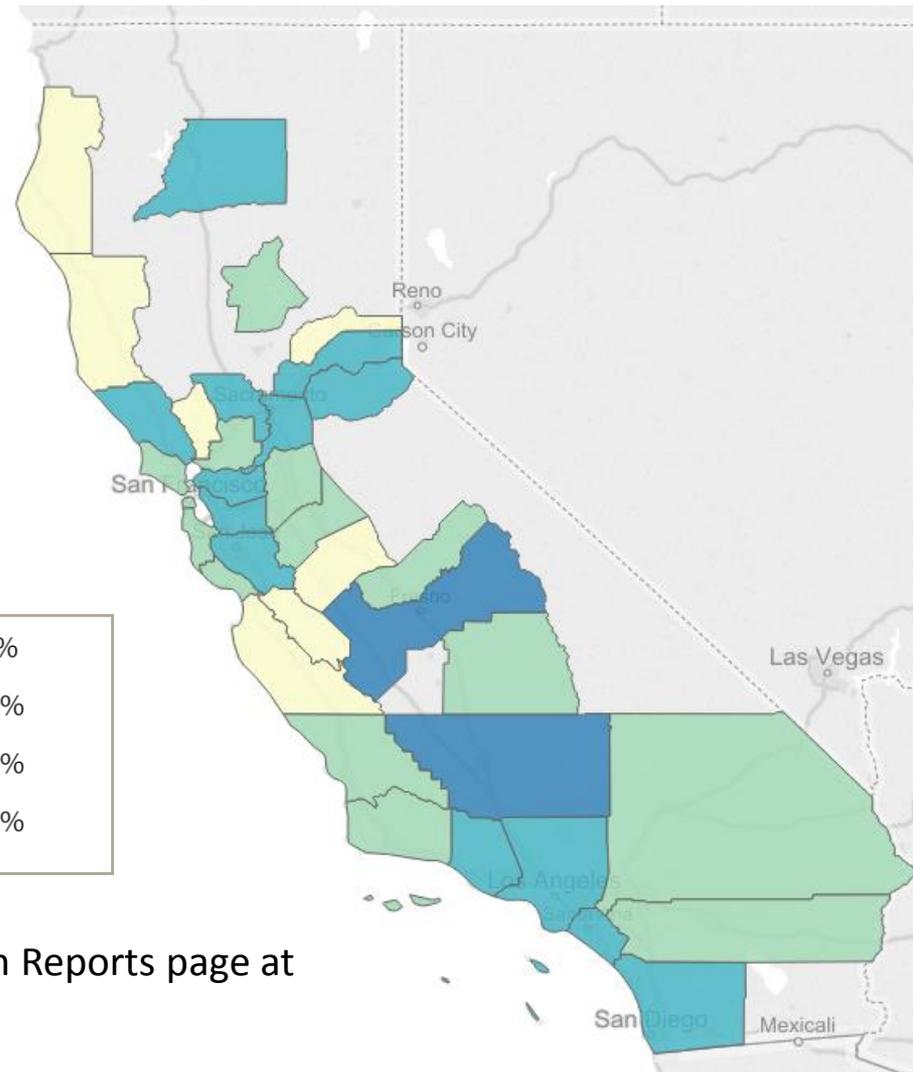
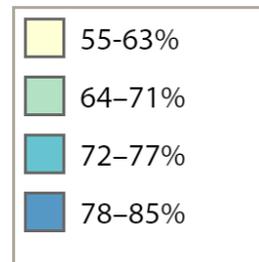


Share by Major Brand: CA



CVRP Participation (March 2010–March 2015)*

- Statewide, life-of-program average participation rate >74%
- >67% for PHEV consumers
- >81% for BEV consumers



*Topic brief available for download from the Program Reports page at <https://cleanvehiclerebate.org>

Majority Characteristics of CVRP Consumers

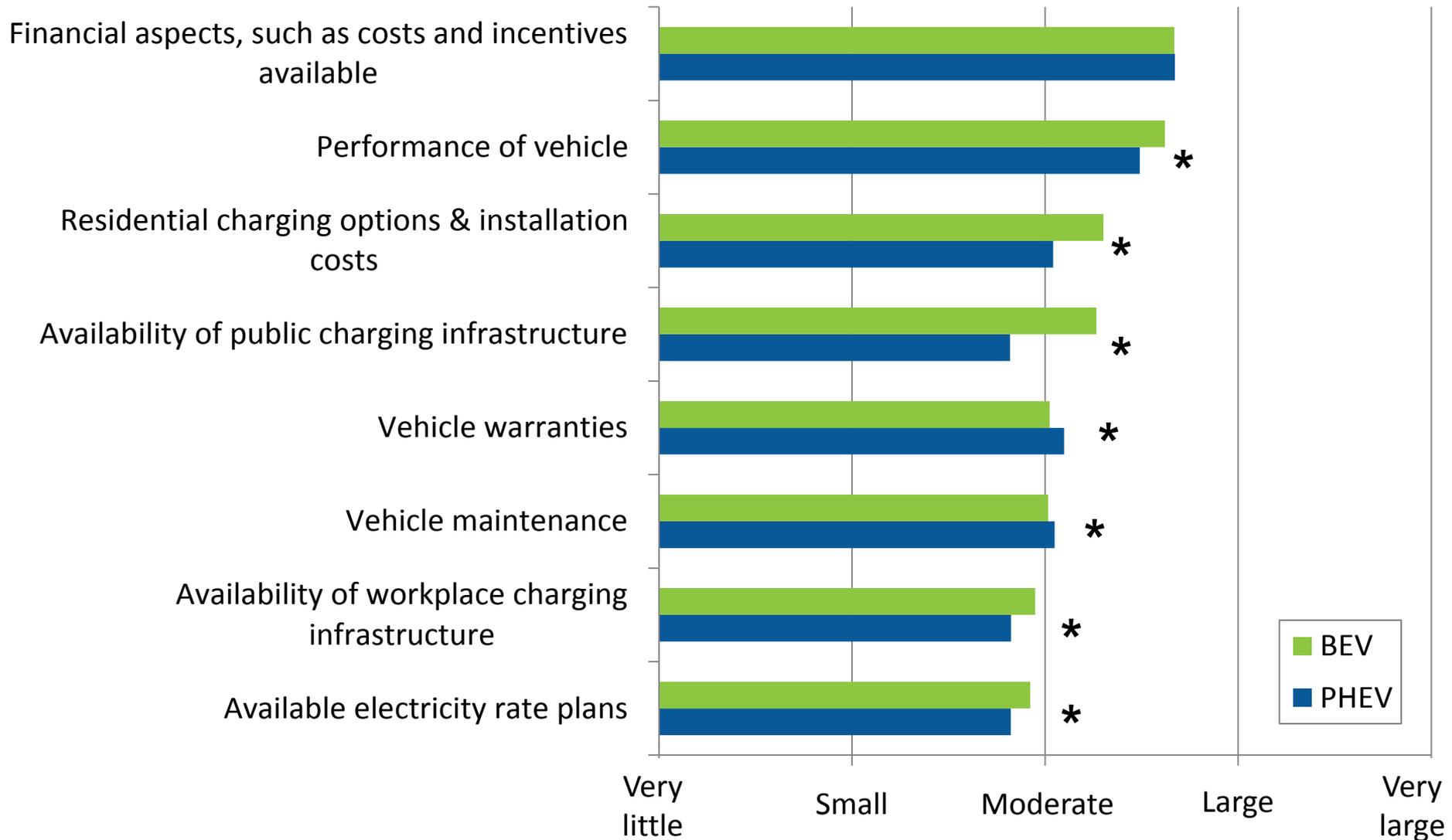
| | CVRP rebate recipients (CVRP 2012–2015) | New-vehicle “intenders” (CHTS 2012) | CA residents (Census 2014) |
|-------------------------------------|---|---|--------------------------------------|
| 40–59 years old | 56% | 52% | 27% |
| Bachelor’s | 34% | 66% | 31% |
| Postgraduate | 49% | 34% | 11% |
| Male | 75% | 49% | 50% |
| White/Caucasian | 64% | 76% | 62% |
| Detached homes | 81% | 75% | 66% |
| \$50–200k/y household income | 61% | 58% | 51% |



Time Spent Researching



CVRP Consumer Time Dedicated to Research – by Vehicle Category



Importance of Saving Money on Fuel vs. Gas Prices

