



# Electric Vehicle Incentives and Policies

*National Governor's Association Maryland Grid Modernization Retreat*

7 November 2019, Hanover MD

Image: [https://parade.com/639991/scott\\_steinberg/the-ultimate-city-guide-to-baltimore-maryland/](https://parade.com/639991/scott_steinberg/the-ultimate-city-guide-to-baltimore-maryland/)

Brett Williams, PhD – Principal Advisor, EV Programs

*with thanks to Jennifer Boughton, Michelle Jones, Eric Fullenkamp, and others at CSE*



Center for  
Sustainable  
Energy™

# CSE Areas of Expertise

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## **Clean Transportation**

Adoption of electric vehicles  
and deployment of charging  
infrastructure



## **Built Environment**

Advancing energy efficiency  
and renewable resources



## **Technology Convergence**

Interconnecting systems to  
achieve decarbonization

# State EV Cash Rebate Programs Administered by CSE

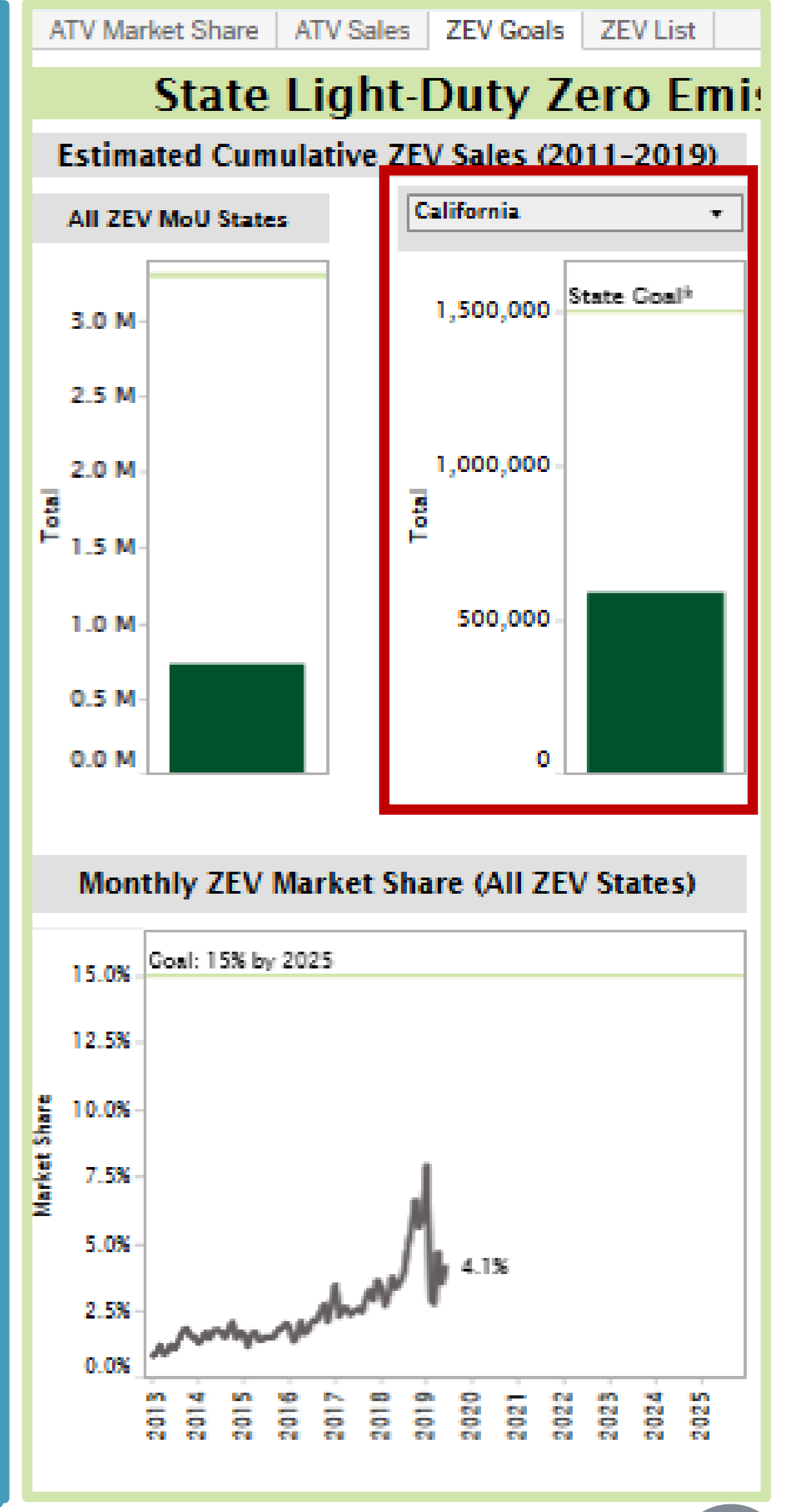
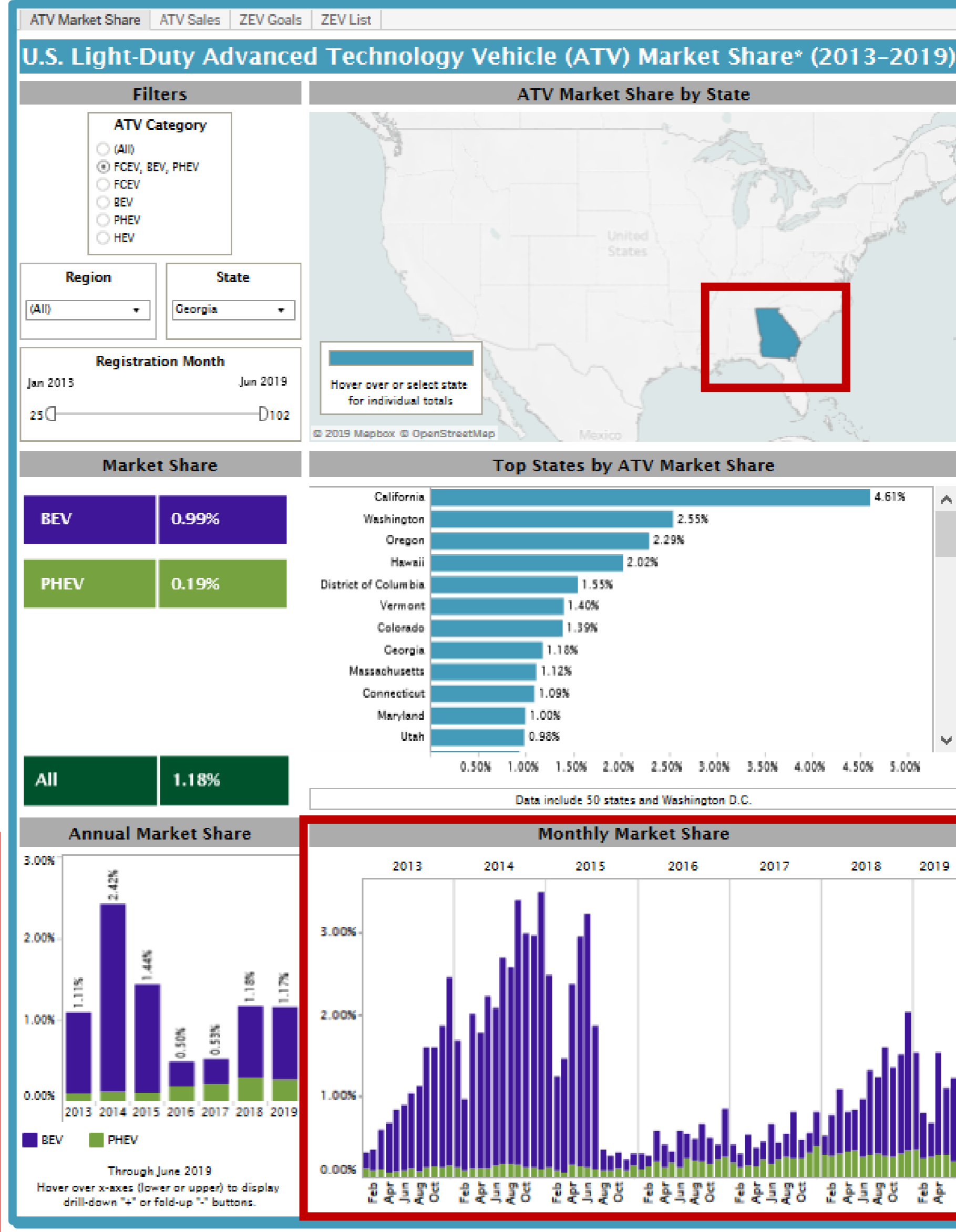
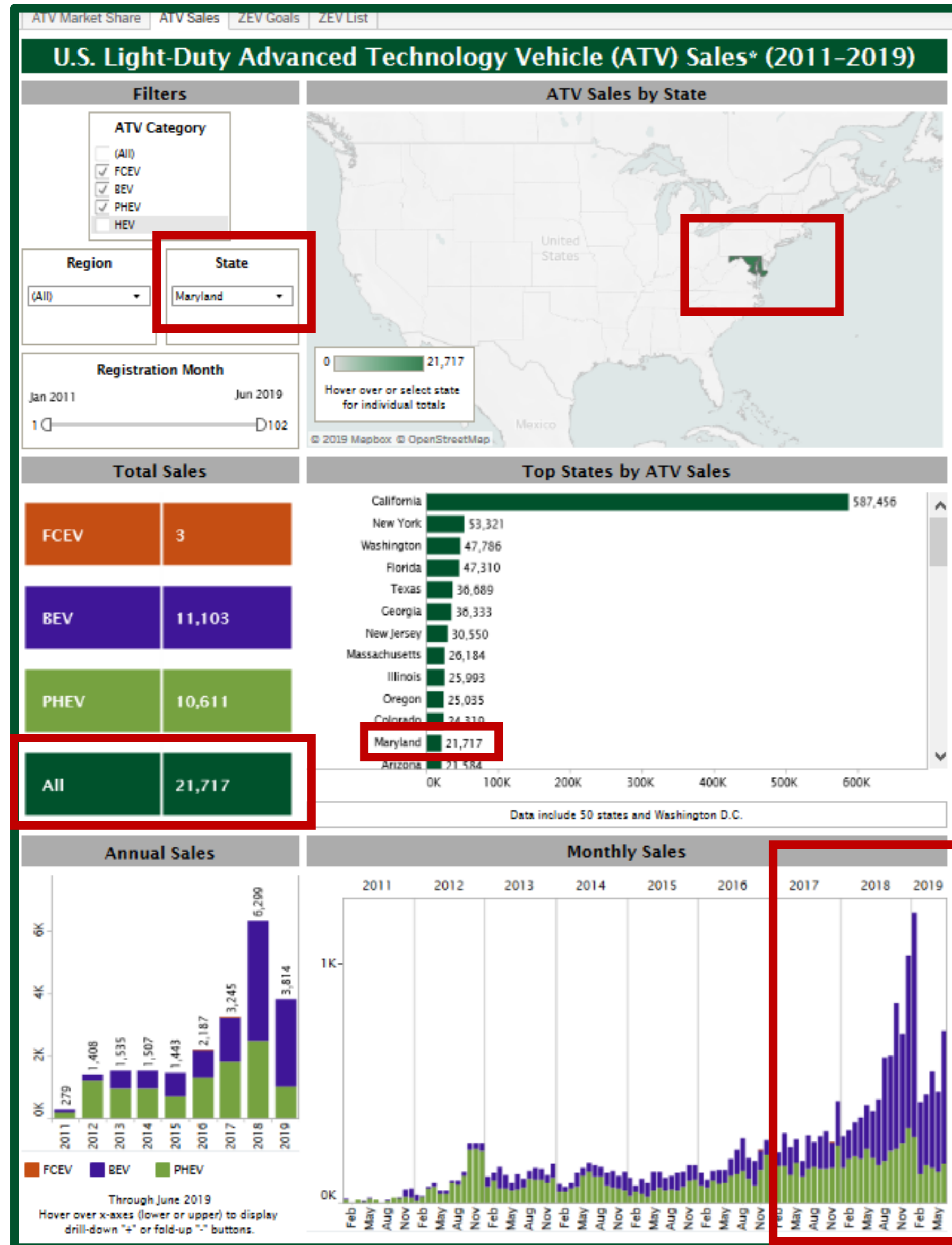
(as of 30 Sep. 2019)



## Oregon CVRP

	CALIFORNIA CLEAN VEHICLE REBATE PROJECT	MOR-EV Massachusetts Offers Rebates for Electric Vehicles	CHEAPR Connecticut Hydrogen and Electric Automobile Purchase Rebate	NEW YORK STATE	Oregon CVRP
<b>Fuel-Cell EVs</b>	\$5,000	\$1,500	\$5,000		
<b>All-Battery EVs</b>	\$2,500	\$1,500	≥ 200 e-miles \$2,000 ≥ 120 e-miles \$1,500 < 120 e-miles \$500	≥ 120 e-miles \$2,000 ≥ 40 e-miles \$1,700 ≥ 20 e-miles \$1,100 < 20 e-miles \$500	≥ 10 kWh \$2,500 < 10 kWh \$1,500
<b>Plug-in Hybrid EVs</b>	\$2,500 (i3 REx) \$1,500	BEVx only: \$1,500	≥ 45 e-miles \$1,000 < 45 e-miles \$500		
<b>Zero-Emission Motorcycles</b>	\$900	\$450			\$750 (and NEVs)
	<ul style="list-style-type: none"> <li>≥ 20 e-miles</li> <li>Income cap</li> <li>Increased rebates for lower-income households (+\$2,000)</li> </ul>	<ul style="list-style-type: none"> <li>Purchase price ≤ \$50k</li> <li>No fleet rebates</li> </ul> Program ended 9/30/19	<ul style="list-style-type: none"> <li>BEVs &amp; PHEVs ≤ \$50k base MSRP, FCEVs ≤ \$60k</li> <li>Point-of-sale option</li> <li>\$150 dealer incentive</li> </ul>	<ul style="list-style-type: none"> <li>Base MSRP &gt; \$60k = \$500</li> <li>Point-of-sale</li> </ul>	<ul style="list-style-type: none"> <li>Base MSRP &lt; \$50k</li> <li>Point-of-sale option</li> <li>Increased rebates for lower-income households (+\$2,500), used EVs also</li> </ul>

# AA 50-State EV Sales, Market Share, and Goals Dashboard



Dashboard prepared by CSE for AA; linked at [zevfacts.com](http://zevfacts.com)

# Outline

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- Statewide EV Rebate Program Update
  - Outputs: Vehicles & Consumers Rebated
  - Outcomes: Behaviors Influenced
  - Impacts: Emission & Market
- Additional Design Considerations
  - Equity: Income caps compared to MSRP caps
  - Vehicle eligibility criteria (MSRP, e-range)
- Dealer Incentives
- Musings for Maryland
- Wrap Up, Additional Info

*\* EVs = light-duty plug-in hybrid, battery, and fuel-cell electric vehicles  
(PHEVs, BEVx vehicles, BEVs, and FCEVs)*

A close-up photograph of a person's hand plugging a charging cable into the port of an electric vehicle. The scene is set outdoors at sunset, with warm, golden light and lens flare effects. In the background, a charging station and a bicycle are visible, though slightly out of focus.

# Statewide EV Rebate Program Update

Outputs, Outcomes, and Impacts

# EV Rebate Designs

(As of Sept. 2018; Reflective of Most of the Data Gathered)



**Fuel-Cell EVs**



\$5,000

\$2,500

\$5,000

e-miles

≥ 120	\$2,000
≥ 40	\$1,700
≥ 20	\$1,100
< 20	\$500

**All-Battery EVs**



\$2,500

\$2,500

e-miles

≥ 175	\$3,000
≥ 100	\$2,000
< 100	\$500

**Plug-in Hybrid EVs**



\$2,500 (i3 REx)  
\$1,500

≥10 kWh \$2,500  
<10 kWh \$1,500

≥ 40	\$2,000
< 40	\$500

**Zero-Emission Motorcycles**



\$900

\$750

- e-miles ≥ 20 only
- Consumer income cap
- increased rebates for lower-income households

- Base MSRP ≥ \$60k = \$1,000 max.
- no fleet rebates

Program ended 9/30/19

- Base MSRP ≤ \$60k only
- dealer assignment
- \$150 dealer incentive (\$300 previous)

- Base MSRP > \$60k = \$500 max.
- point-of-sale via dealer

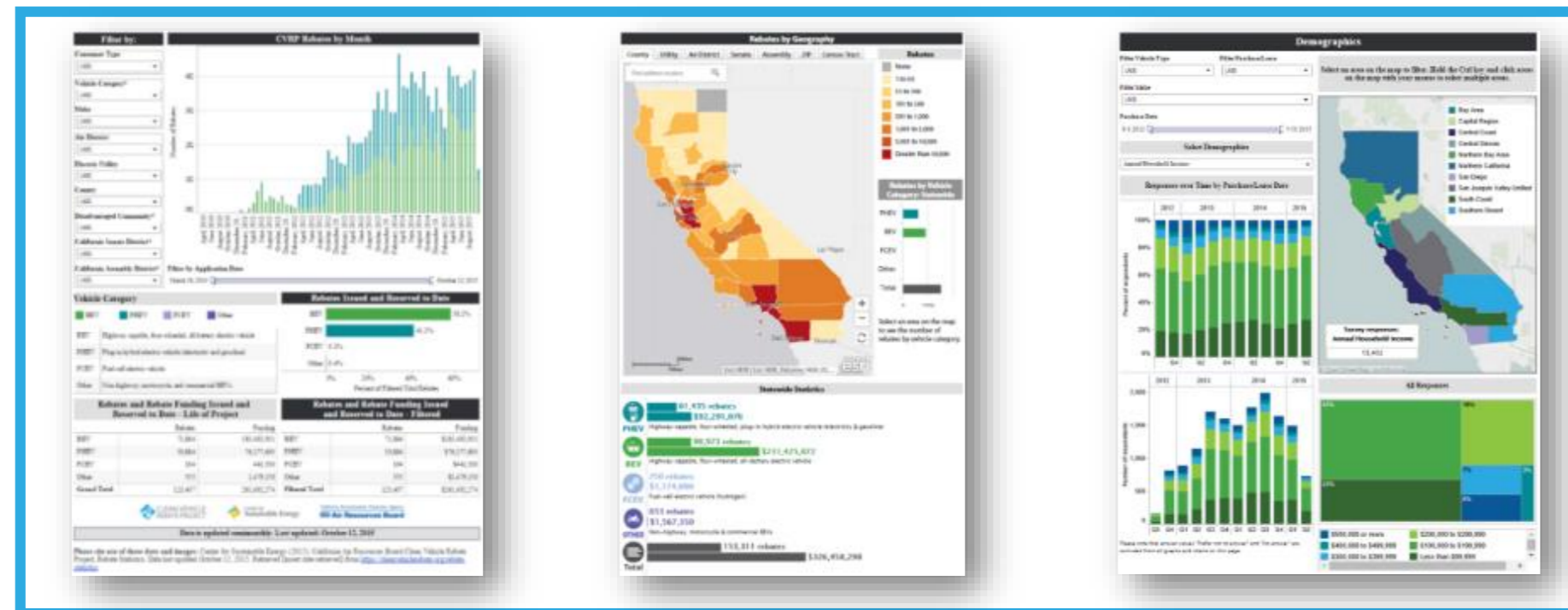


# Outputs: Vehicles Rebated

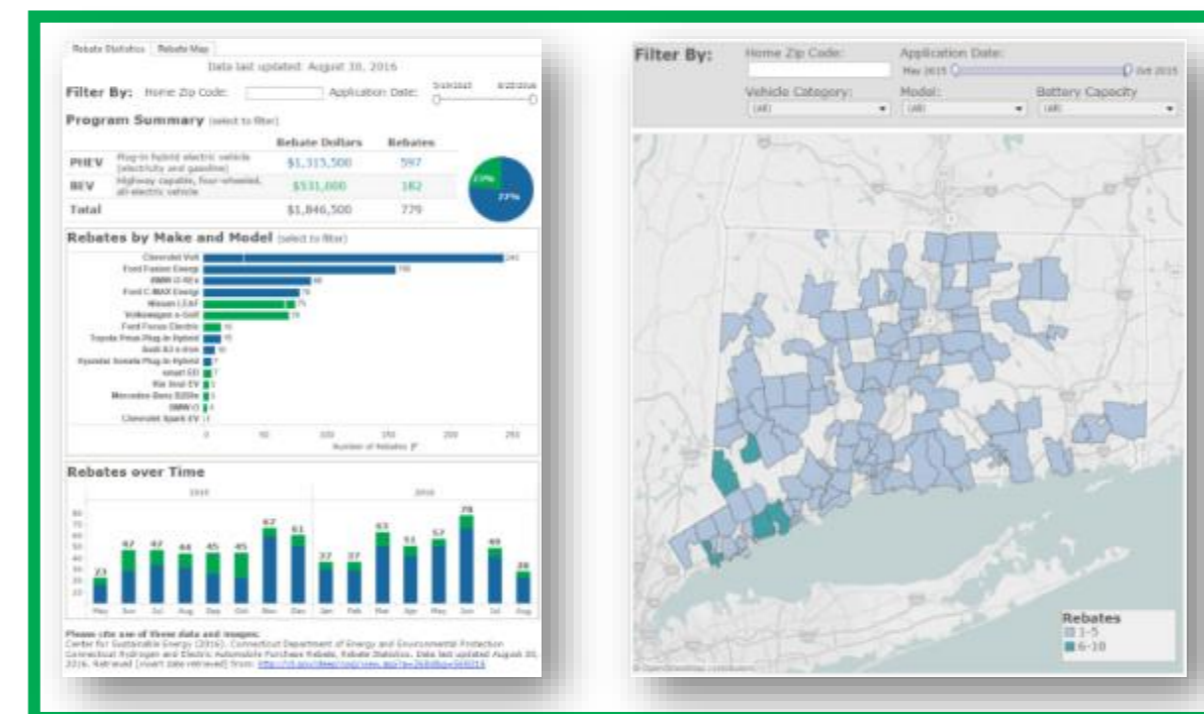


# Where Are EV Rebates Going?

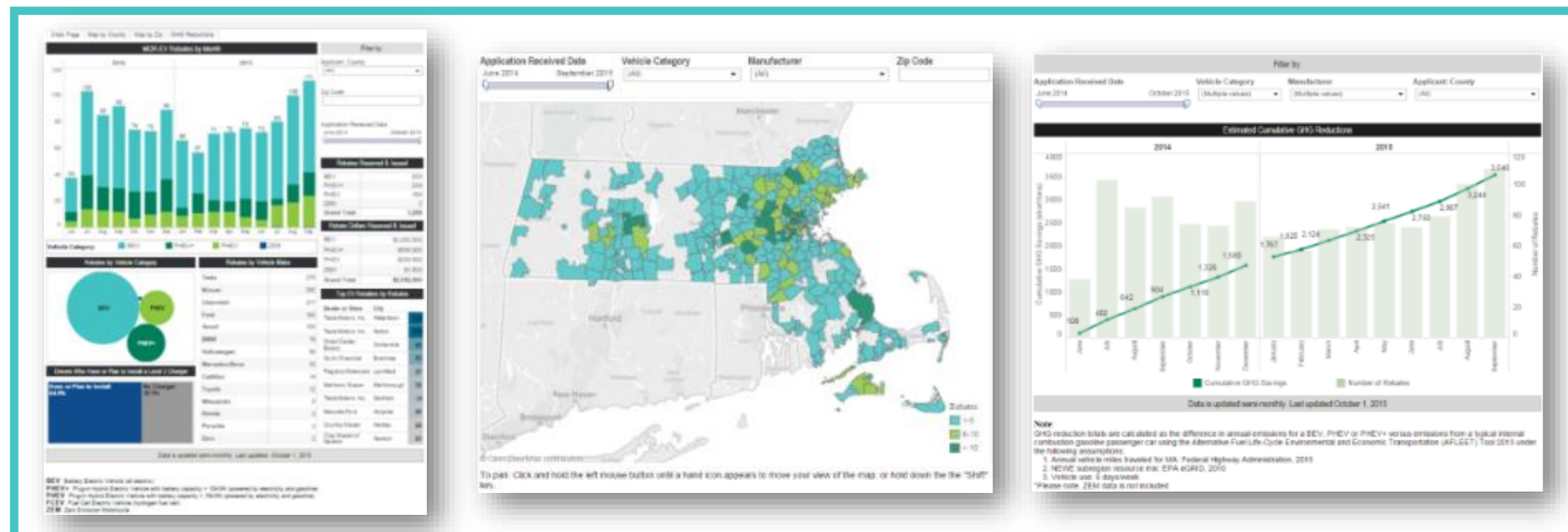
## Public Dashboards and Data Facilitate Informed Action



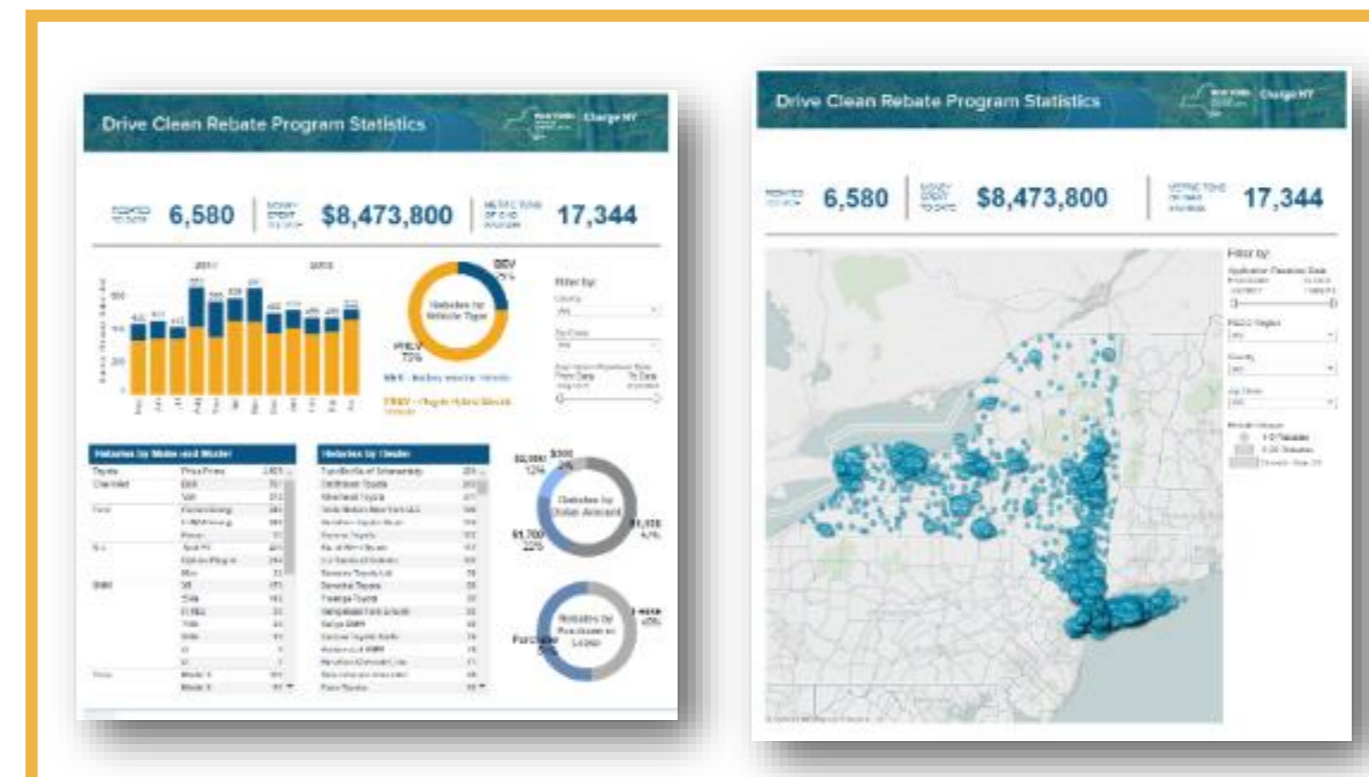
[cleanvehiclerebate.org](http://cleanvehiclerebate.org)



[ct.gov/deep](http://ct.gov/deep)



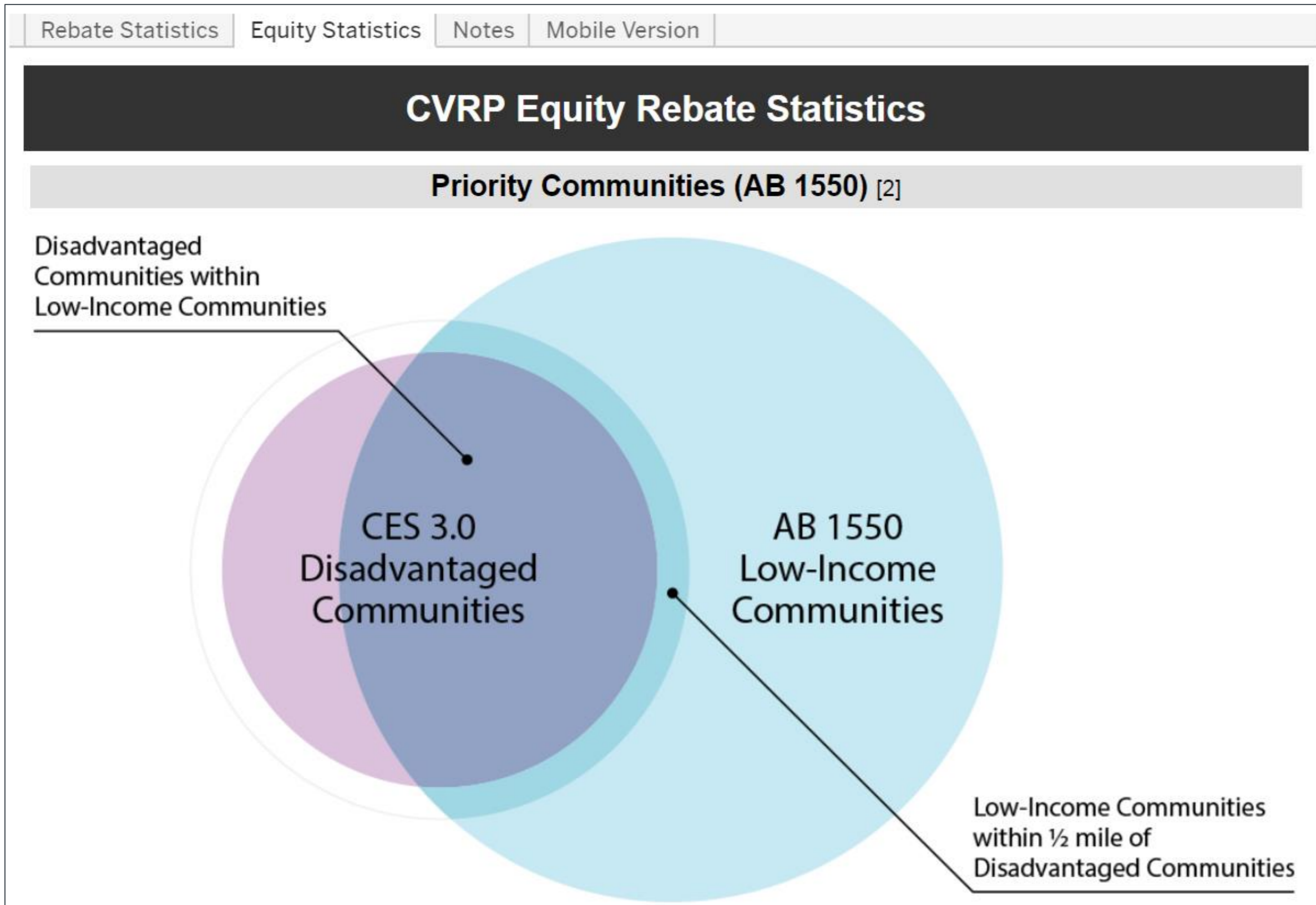
[mor-ev.org](http://mor-ev.org)



[nyscrda.ny.gov](http://nyscrda.ny.gov) (dashboards done by NYSERDA)

- > 350,000 EVs and consumers have received > \$720 M in rebates
- > 70,000 survey responses being analyzed so far, statistically represent > 300,000 consumers
- Reports, presentations, and analysis growing

# Equity Statistics Dashboard *(partial)*



## Rebates by Equity Group [2]

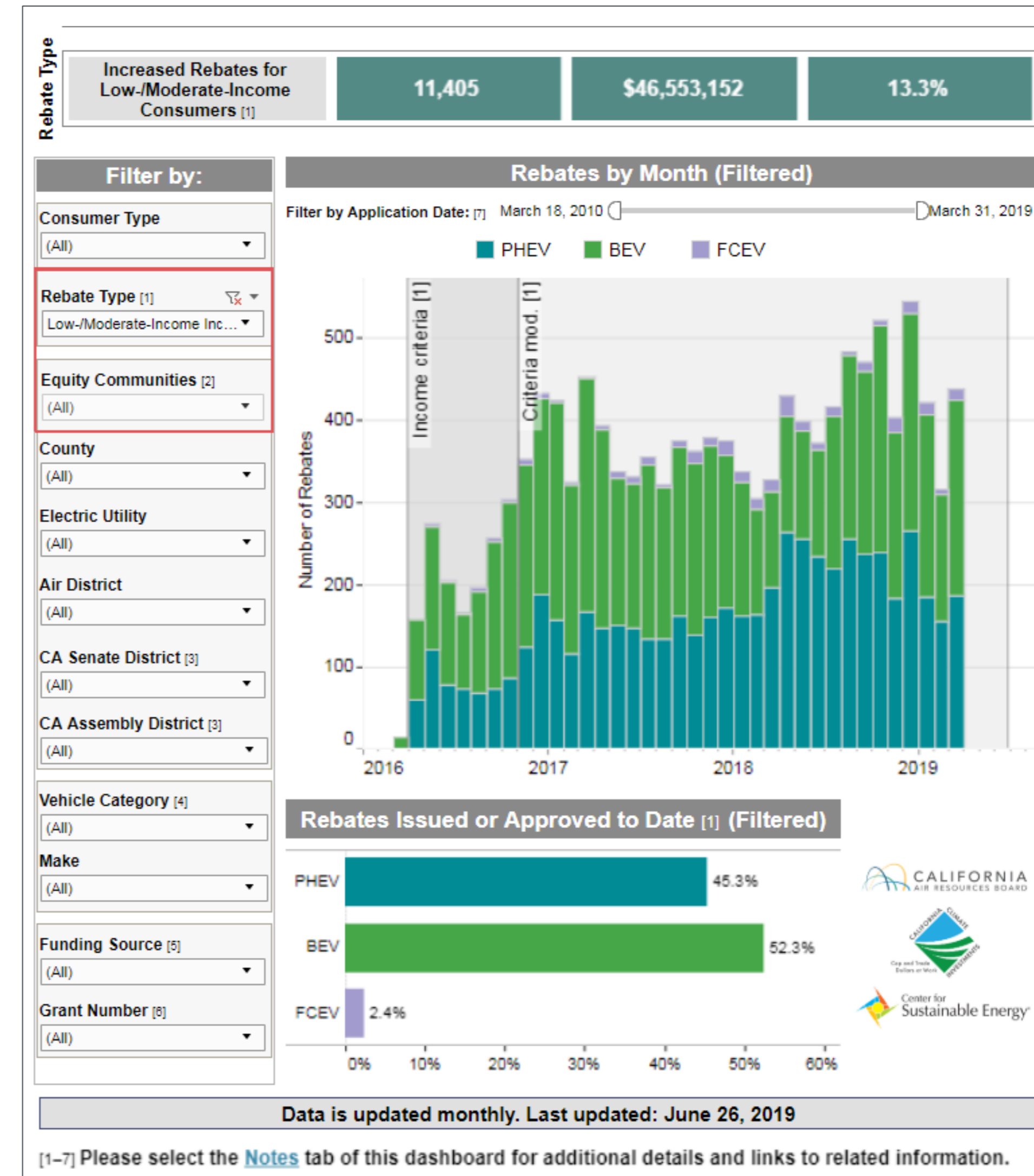
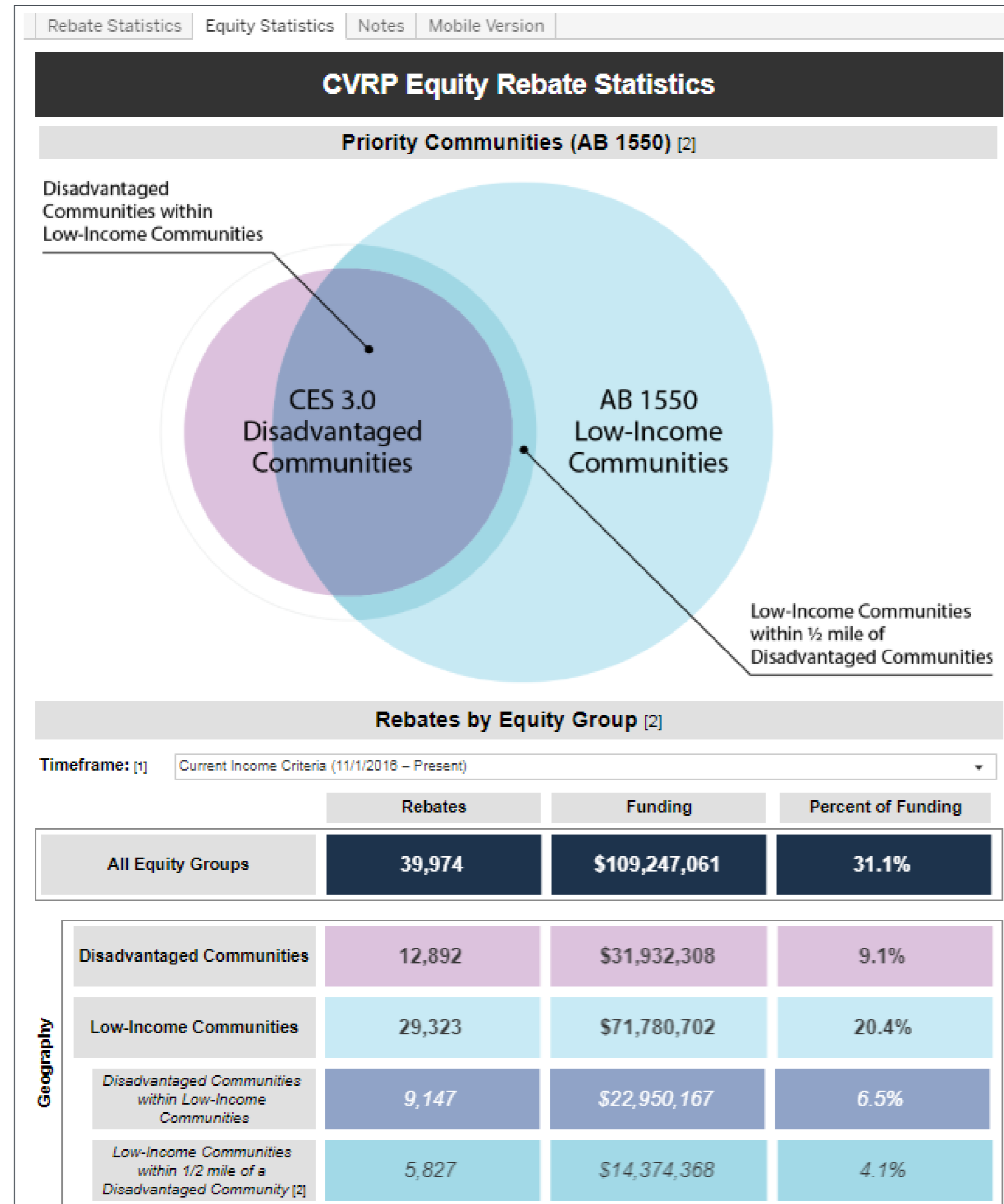
Timeframe: [1]

	Rebates	Funding	Percent of Funding
<b>All Equity Groups</b>	<b>39,974</b>	<b>\$109,247,061</b>	<b>31.1%</b>
<b>Disadvantaged Communities</b>	<b>12,892</b>	<b>\$31,932,308</b>	<b>9.1%</b>
<b>Low-Income Communities</b>	<b>29,323</b>	<b>\$71,780,702</b>	<b>20.4%</b>
<i>Disadvantaged Communities within Low-Income Communities</i>	<i>9,147</i>	<i>\$22,950,167</i>	<i>6.5%</i>
<i>Low-Income Communities within 1/2 mile of a Disadvantaged Community [2]</i>	<i>5,827</i>	<i>\$14,374,368</i>	<i>4.1%</i>
<b>Increased Rebates for Low-/Moderate-Income Consumers [1]</b>	<b>11,405</b>	<b>\$46,553,152</b>	<b>13.3%</b>

**Geography**

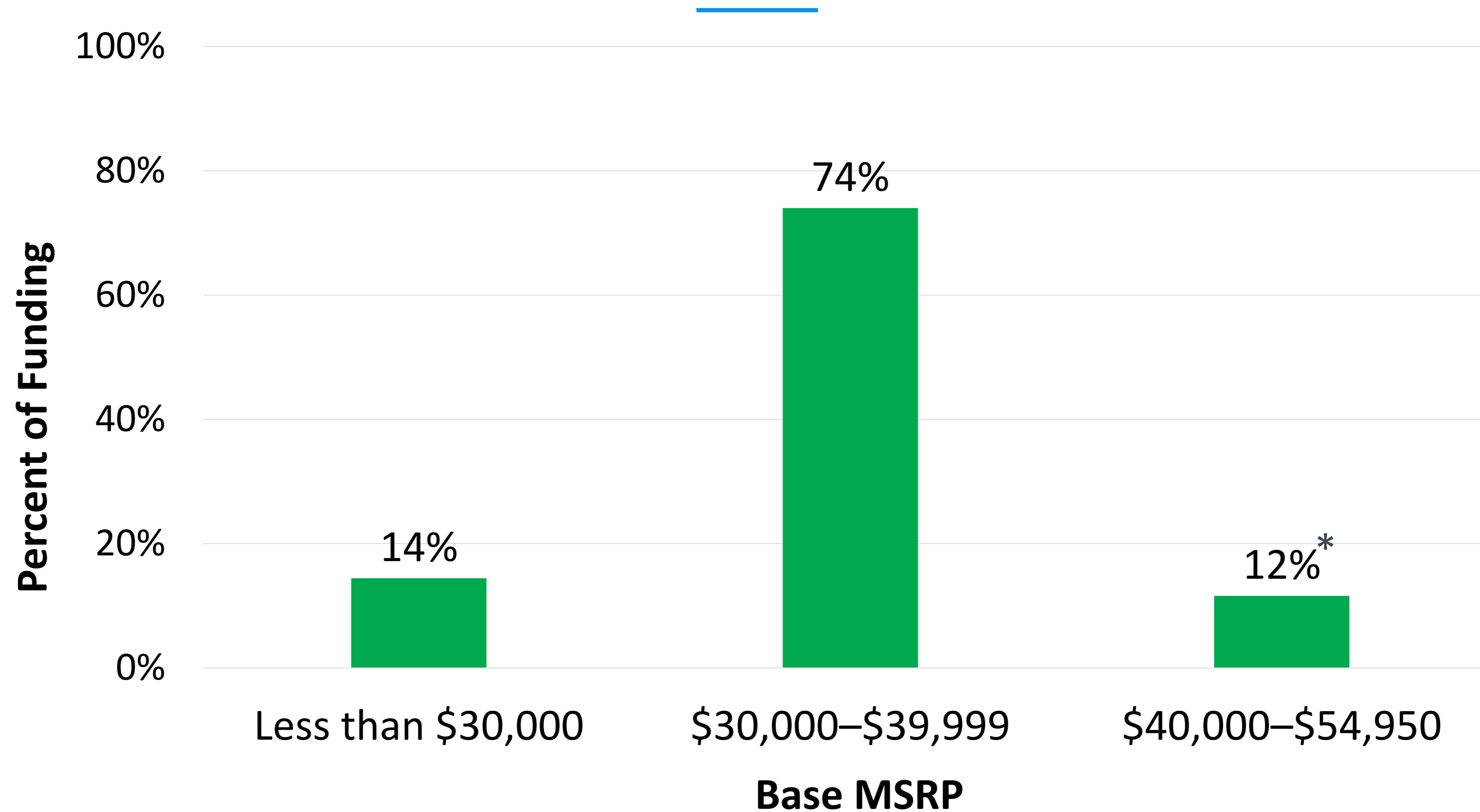
**Rebate Type**

# Equity Statistics Dashboard



# Moderately Priced Vehicles Received Most Funding

(thru April 2018, pre-“Model 3 effect”)







\*\$44,000 MSRP used for all rebated Model 3 vehicles.

N=2,709 total CHEAPR rebates through April 2018; includes fleet rebates



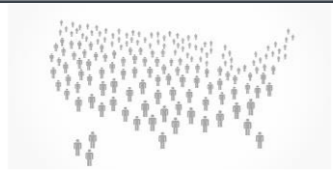
# Outputs: Consumers Rebated

# Consumer Survey Data *(Shows Rebates to Individuals Only)*

					<b>Total</b>
<b>Vehicle Purchase/ Lease Dates</b>	Dec. 2010 – Dec. 2018	Jun. 2014 – Oct. 2018	May 2015 – Sep. 2018	Mar. 2017 – Jul. 2018	Dec. 2010 – Dec. 2018
<b>Survey Responses (total n)*</b>	62,092	4,555	1,565	1,808	70,020
<b>Program Population (N)</b>	278,538	10,920	3,510	8,651	301,619

*\* Weighted to represent the program population along the dimensions of vehicle category, vehicle model, buy vs. lease, and county (using raking method)*

# Setting an Appropriate Baseline: Car Buyers Are Different Than the Population

	 <b>All</b> U.S. Population (Census 2017)		<b>New-Vehicle Buyers</b> U.S. MYs 2016–17 (2017 NHTS)
Selected solely White/Caucasian	61%	<<	74%
≥ 50 Years Old	34%	<<	51%
≥ Bachelor's Degree*	23%	<<<<	56%
Own Residence	63%	<<	75%
≥ \$150k HH Income	12%	<<	23%
Selected Male	49%	≈	51%

- New-car buyers are different on almost every dimension.
- More frequently:
  - White
  - Older
  - Degree holders
  - Residence owners
  - Higher income
- Some differences explained by driving age...

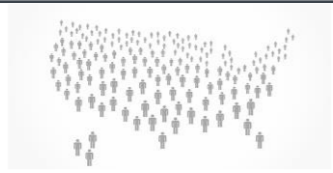
*“Prefer not to answer,” “I don’t know,” and similar responses are excluded throughout.*

*Census 2017: 2013–2017 American Community Survey, <http://factfinder2.census.gov>.*

*2017 NHTS weighted to represent population, not new-vehicle subset. New-vehicle buyers identified based on within-100-mile match between odometer and miles driven while owned.*

*\* Census & NHTS data characterize individual educational attainment.*

# Setting an Appropriate Baseline: Car Buyers Are Different Than the Population

	 <b>All</b> U.S. Population (Census 2017)	<b>Driving Age</b> <i>16+ Years Old</i> U.S. Population (Census 2017)	<b>“Buying Age”</b> <i>21+ Years Old</i> U.S. Population (Census 2017)	<b>New-Vehicle Buyers</b> U.S. MYs 2016–17 (2017 NHTS)
Selected solely White/Caucasian	61%	64%	65% <	74%
≥ 50 Years Old	34%	43%	47% <	51%
≥ Bachelor’s Degree*	23%	27%	30% <<<	56%
Own Residence	63%	63%	64% <<	75%
≥ \$150k HH Income	12%	12%	12% <<	23%
Selected Male	49%	49%	49% ≈	51%

- Some of the difference explained by driving or buying age
- The rest may be due in part to *social inequities*

“Prefer not to answer,” “I don’t know,” and similar responses are excluded throughout.





Census 2017: 2013–2017 American Community Survey, <http://factfinder2.census.gov>.

2017 NHTS weighted to represent population, not new-vehicle subset. New-vehicle buyers identified based on within-100-mile match between odometer and miles driven while owned.

\* Census & NHTS data characterize individual educational attainment.



# Rebated EV Consumer Characteristics: 2017

	<b>“Buying Age”</b> <i>21+ Years Old</i> U.S. Population (Census 2017)	<b>New-Vehicle Buyers</b> U.S. MYs 2016–17 (2017 NHTS)	 CALIFORNIA CLEAN VEHICLE REBATE PROJECT™ CY 2017 weighted n = 9,539	 MOR-EV Massachusetts Offers Rebates for Electric Vehicles CY 2017 weighted n = 1,285	 CHEAPR Connecticut Hydrogen and Electric Automobile Purchase Rebate CY 2017 weighted n = 501	 NEW YORK STATE Mar.–Dec. 2017 weighted n = 1,014
Selected solely White/Caucasian	65%	74%	58%	85%	88%	86%
≥ 50 Years Old	47%	51%	52%	61%	59%	60%
≥ Bachelor’s Degree in HH	30%*	56%*	82%	90%	85%	73%
Own Residence	64%	75%	79%	92%	89%	90%
≥ \$150k HH Income	12%	23%	40%	58%	41%	34%
Selected Male	49%	51%	72%**	74%	71%	68%

*“Prefer not to answer,” “I don’t know,” and similar responses are excluded throughout.*





*Census 2017: 2013–2017 American Community Survey, <http://factfinder2.census.gov>.*

*NHTS weighted to represent population, not new-vehicle subset. New-vehicle buyers identified based on within-100-mile match between odometer and miles driven while owned.*

*\* Census & NHTS data characterize individual educational attainment, whereas other data characterize highest household attainment.*

*\*\* 100% includes non-binary options.*

# Differing Approaches, Similar Metrics...

	“Buying Age” 21+ Years Old U.S. Population (Census 2017)	New-Vehicle Buyers U.S. MYs 2016–17 (2017 NHTS)	 CY 2017 weighted n = 9,539	 Massachusetts Offers Rebates for Electric Vehicles CY 2017 weighted n = 1,285	 CY 2017 weighted n = 501	 Mar.–Dec. 2017 weighted n = 1,014
Selected solely White/Caucasian	65%	74%	58%	85%	88%	86%
≥ 50 Years Old	47%	51%	52%	61%	59%	60%
≥ Bachelor’s Degree in HH	30%*	56%*	82%	90%	85%	73%
Own Residence	64%	75%	79%	92%	89%	90%
≥ \$150k HH Income	12%	23%	40%	58%	41%	34%
Selected Male	49%	51%	72%**	74%	71%	68%

“Prefer not to answer,” “I don’t know,” and similar responses are excluded throughout.

Census 2017: 2013–2017 American Community Survey, <http://factfinder2.census.gov>.



NHTS weighted to represent population, not new-vehicle subset. New-vehicle buyers identified based on within-100-mile match between odometer and miles driven while owned.

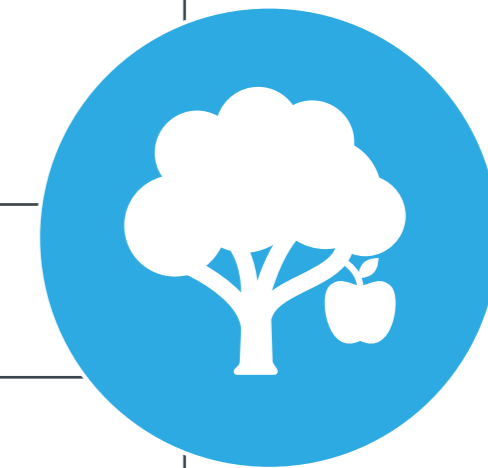
\* Census & NHTS data characterize individual educational attainment, whereas other data characterize highest household attainment.

\*\* 100% includes non-binary options.

# EV Consumer Characteristics—NY



	 NY Population <i>21+ Years Old</i> (Census 2017)	NY New-Vehicle Buyers (2017 NHTS)	 NY EV Consumers, (rebated for Mar. 2017 – Jul. 2018 adoption)
Selected solely White/Caucasian	58%	74%	86%
Male	48%	49%	70%
≥ Bachelor’s degree in HH	35%*	64%*	76%
Own Residence	54%	73%	90%
≥ 50 years old	47%	43%	59%
≥ \$150k HH Income	16%	23%	39%





Census 2017: 2013–2017 American Community Survey, <http://factfinder2.census.gov>.

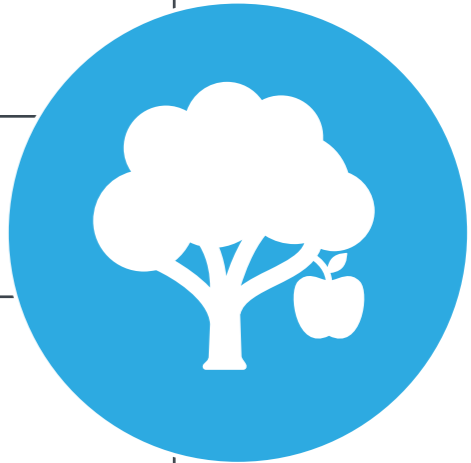
National Household Travel Survey, 2017 calendar year: filtered for model year 2016/2017, state = NY, weighted n = 414,721.

NYSERDA Adoption Survey, 2017–18 edition: filtered to purchase/lease dates Mar 2017–Jul 2018, weighted n = 1,808.

\*Census & NHTS data characterize individual educational attainment, whereas other data characterize highest household attainment.

# EV Consumer Characteristics—MA

	 MA Population <i>21+ Years Old</i> (Census 2017)	New England New-Vehicle Buyers (2017 NHTS)	 MA EV consumers, (rebated for Jun. 2014 – Oct. 2018 adoption)
Selected solely White/Caucasian	76%	88% >	85%
Male	48%	49% <<<	78%
≥ Bachelor’s degree in HH	41%*	61%*	90%
Own Residence	62%	82% <	92%
≥ 50 years old	48%	49% <	58%
≥ \$150k HH Income	20%	37% <<	58%



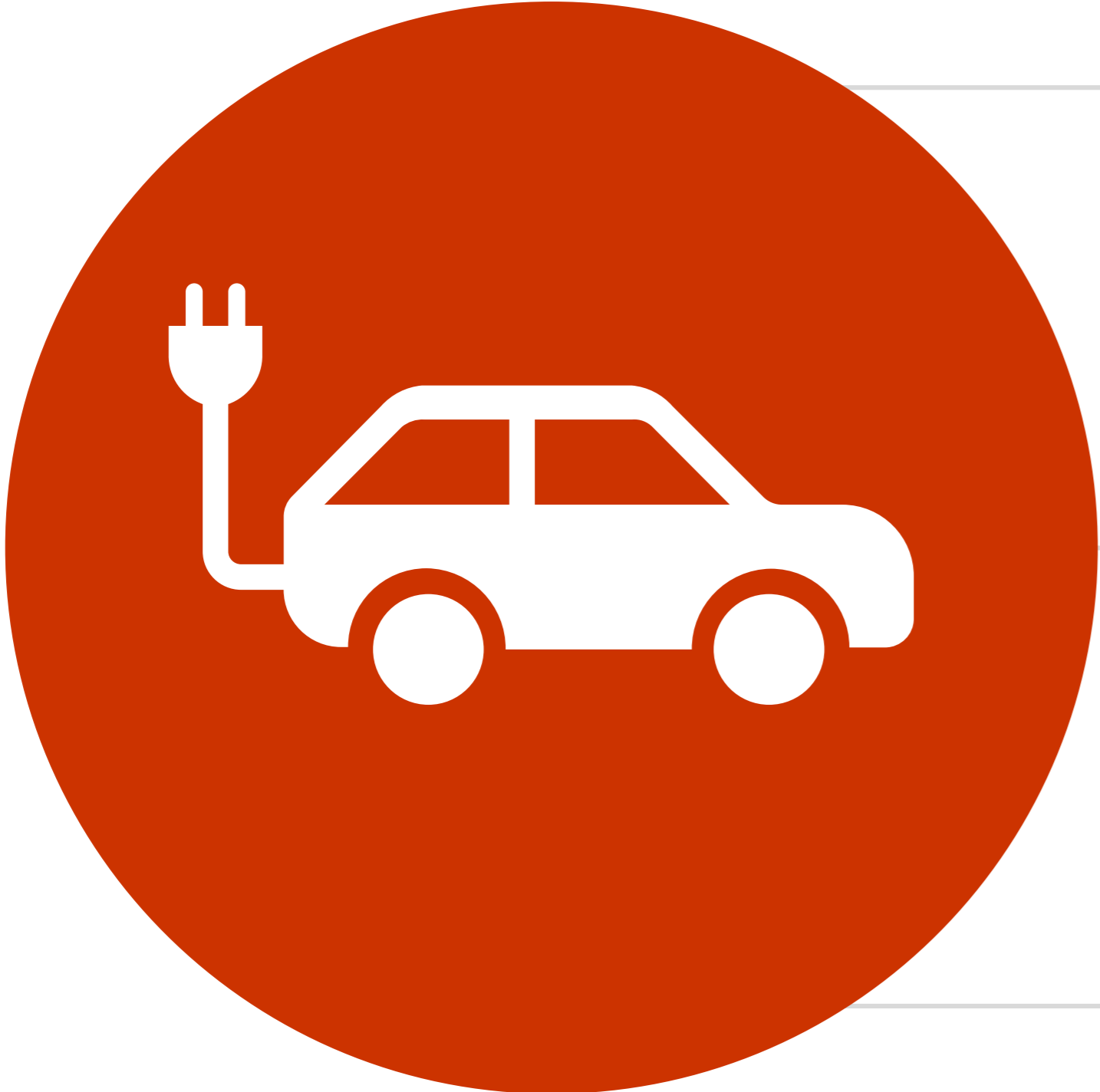
Census 2017: 2013–2017 American Community Survey, <http://factfinder2.census.gov>.  
 National Household Travel Survey, 2017 calendar year: filtered for model year 2016/2017, state = CT, MA, ME, RI, VT, NH, weighted n = 330,437.  
 MOR-EV Survey 2016 – 17 & 2017–18 edition: filtered to purchase/lease dates June 2014–Oct 2018, weighted n = 4,555.  
 \*Census & NHTS data characterize individual educational attainment, whereas other data characterize highest household attainment.



# What is the path forward?

Strategies for Program Design and Outreach

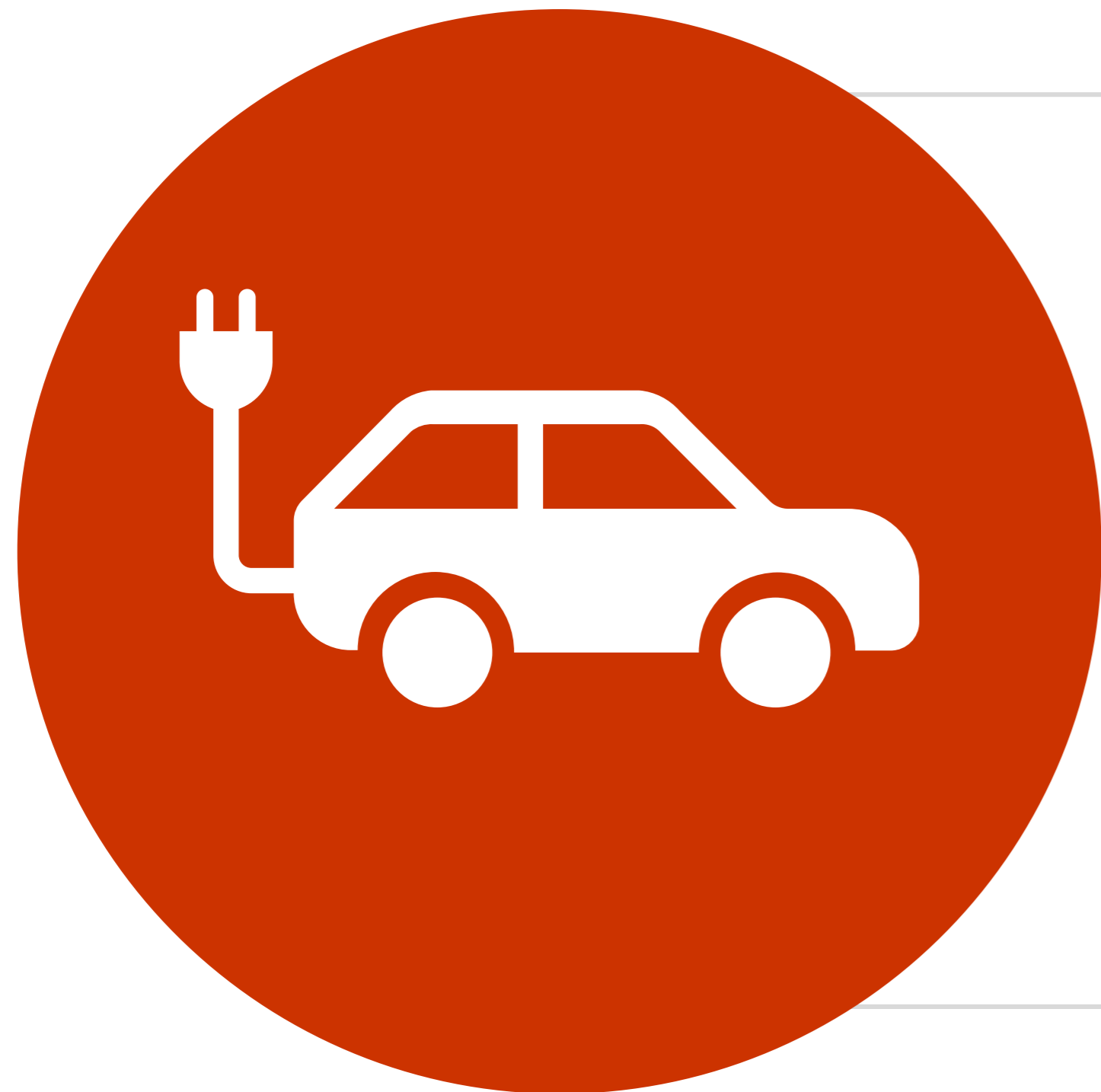
# How Can Research Help Us Grow Markets for Electric Vehicles?



## Low-Hanging Fruit

Understand existing adopters to reinforce and scale what is already working

# How Can Research Help Us Grow Markets for Electric Vehicles?



## Low-Hanging Fruit

Understand existing adopters to reinforce and scale what is already working



## Tough Nuts to Crack

Understand and break down barriers faced by consumers targeted based on policy priorities



## Expanding Market Frontiers

Go beyond the enthusiastic core of EV markets in order to expand further into the mainstream

# Expanding Market Frontiers Through Strategic Segmentation

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## Existing Adopters: Market Acceleration

Characterize existing, generally enthusiastic and pre-adapted consumers, to target similar consumers who have the highest likelihood of adoption



## “Rebate Essential” Consumers: Minimizing Free Ridership

Characterize adopters most highly influenced by supportive resources to join the EV market, to improve the cost-effectiveness of outreach and program design

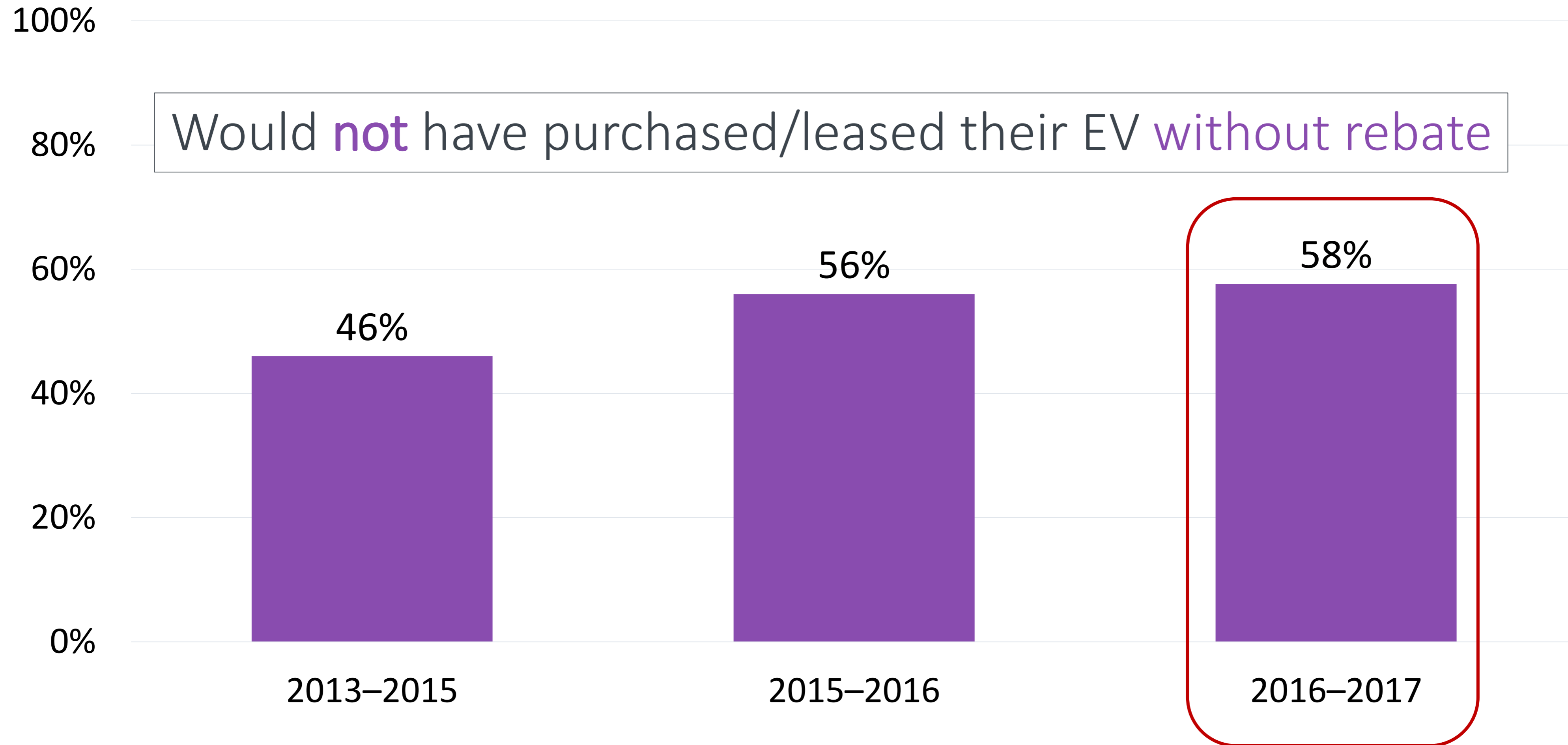


## “EV Converts”: Moving Mainstream

Characterize EV consumers with low initial interest in EVs, to look for additional opportunities to expand into the mainstream



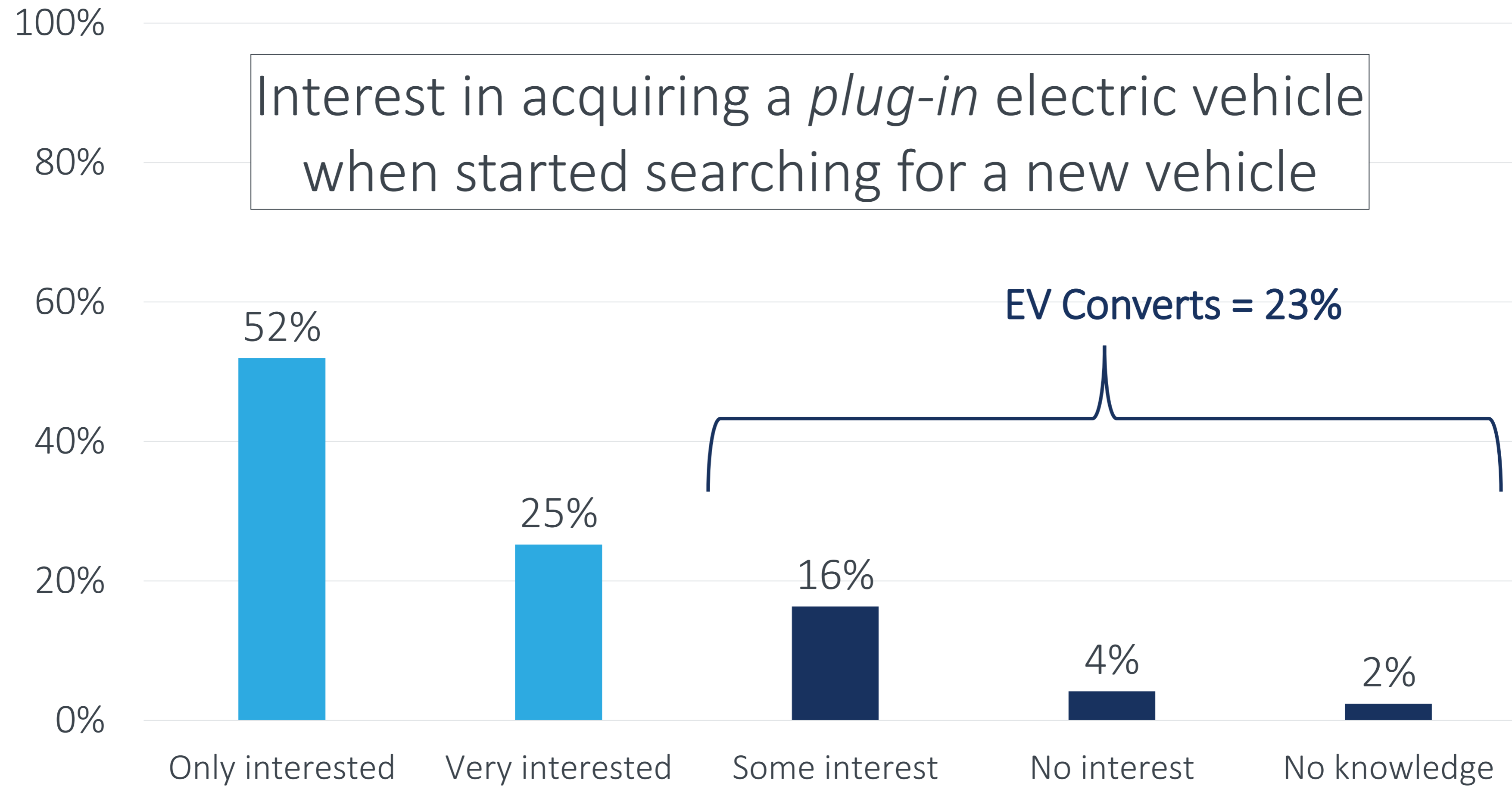
# “Rebate Essentials”: Highly Influenced







*CVRP Consumer Survey: 2013–2015 edition: weighted, question n=19,208;  
2015–2016 edition: weighted, question n=11,457;  
2016–2017 edition: weighted, question n=9,261*



# “EV Converts”: Low Initial Interest



# Paths Forward: CA

	<b>Low-Hanging Fruit</b> <i>Nov. 2016 – Dec. 2018</i> weighted n = 23,478 	<b>Rebate Essentials</b> 	<b>EV Converts</b> 	CA New-Vehicle Buyers, MYs '16–'17 (2017 NHTS)	<b>Priority Populations</b> 
Selected solely White/Caucasian	54% ↑	↑	↑	51%	For example, CalEnviroScreen Disadvantaged Communities or AB 1550 Priority Communities
≥ 50 Years Old	52% ↑	↓	↓	46%	
≥ Bachelor's Degree in HH*	83% ↑↑	↑↑	↑	58%*	
≥ \$150k HH Income	42% ↑	↑	≈	32%	
Selected Male	73%** ↑↑↑	↑↑↑	↑↑	50%	

*"Prefer not to answer," "I don't know," and similar responses are excluded throughout.*

*NHTS weighted to represent population, not new-vehicle subset. New-vehicle buyers identified based on within-100-mile match between odometer and miles driven while owned.*

*\* NHTS data characterize individual educational attainment, whereas other data characterize highest household attainment.*

*\*\* 100% includes non-binary options.*

# Strategic Segments: Explanation

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# Factors that Increase the Odds of Being an EV Convert\* (Relative to Other Plug-in EV Adopters)



Plug-in EV consumers (both PHEV and BEV) are more likely converts if they:

- are **younger**, do **not** have **solar**
- are **not** highly **motivated by** reducing **environmental** impacts or **HOV lane** access
- do **not** spend time **researching EVs online**

Additionally:

- **PHEV** consumers are more likely converts if they chose PHEVs other than the Volt
- **BEV** consumers are more likely converts if they:
  - are **women**, do **not** identify as **white**/Caucasian, **live in** the **Central Valley or LA/SoCal** area, or have **lower income**
  - are **moderately motivated by energy independence**
  - Have **no workplace charging**
  - choose BEVs other than Bolt or Tesla (long-range BEVs?)
  - find the **rebate essential** to purchase/lease

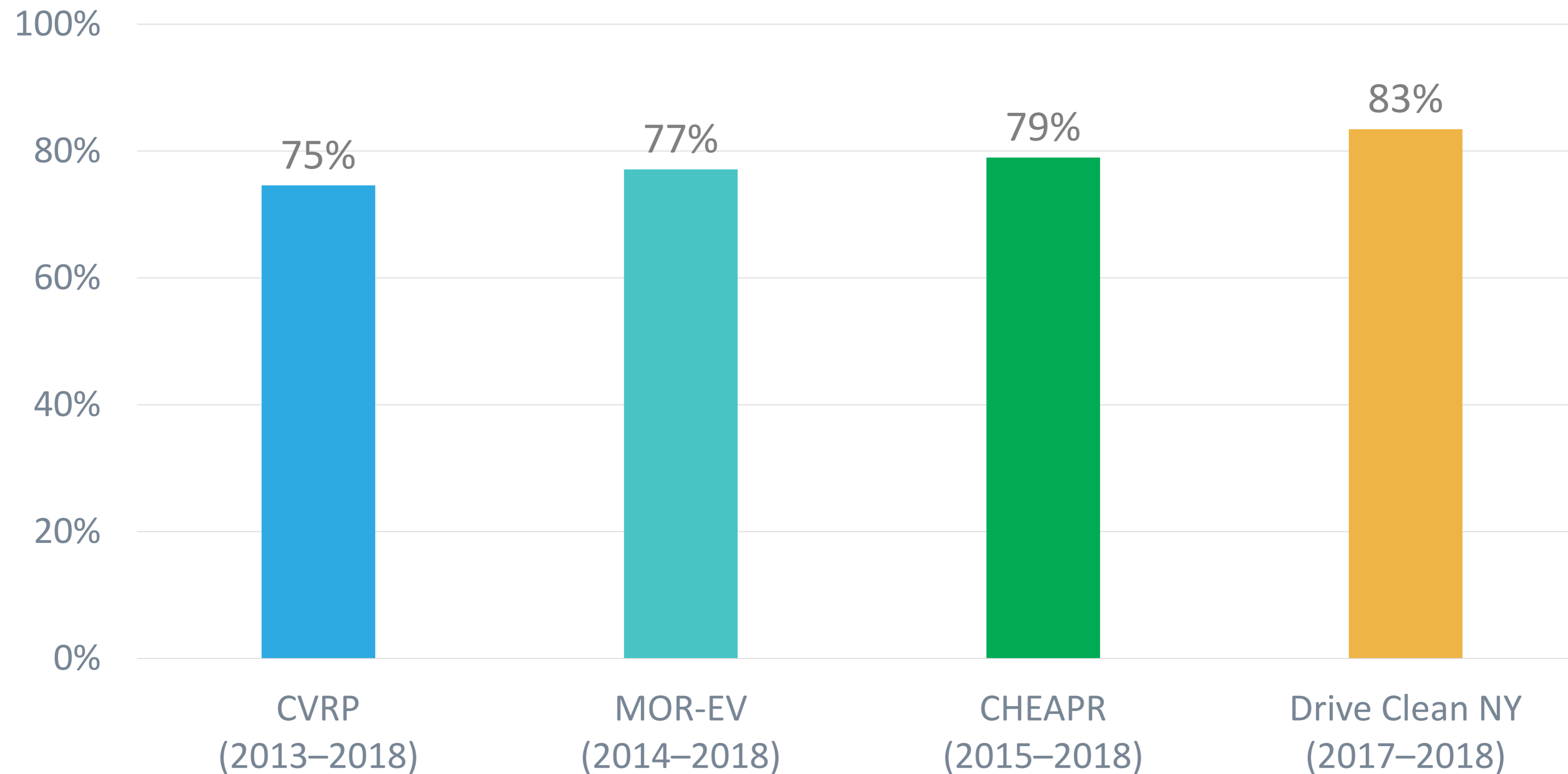
\* Significantly associated factors in binary logistic regression



# Outcomes: Behaviors Influenced

# Do EVs Get Used?

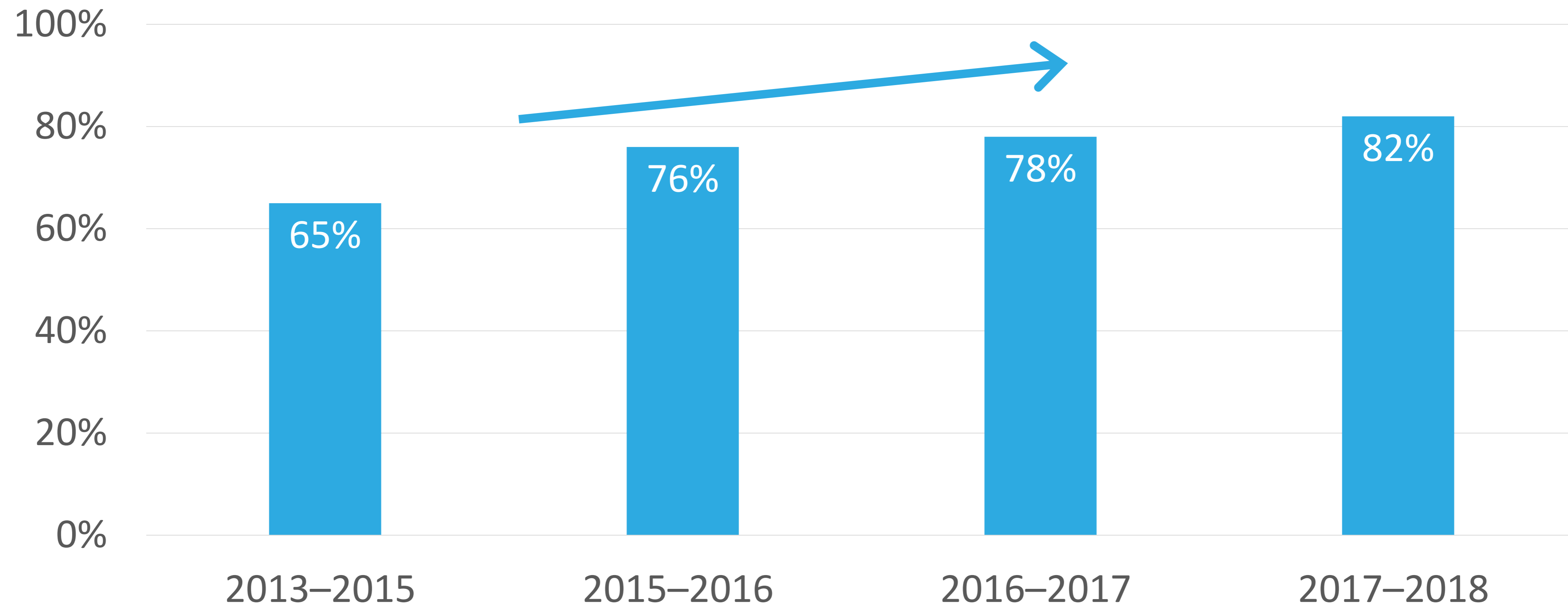
Replaced a vehicle with their rebated **clean vehicle**



*Overall datasets: 70,020 total survey respondents weighted to represent 301,619 rebate recipients*

# Vehicle Replacement is Increasing

Replaced a vehicle with their rebated *plug-in EV*



CVRP Consumer Survey: 2013–2015 edition: weighted, question n=19,247;  
2015–2016 edition: weighted, question n= 11,583;  
2016–2017 edition: weighted, question n= 9,006;  
2017–2018 edition: weighted, question n= 20,847

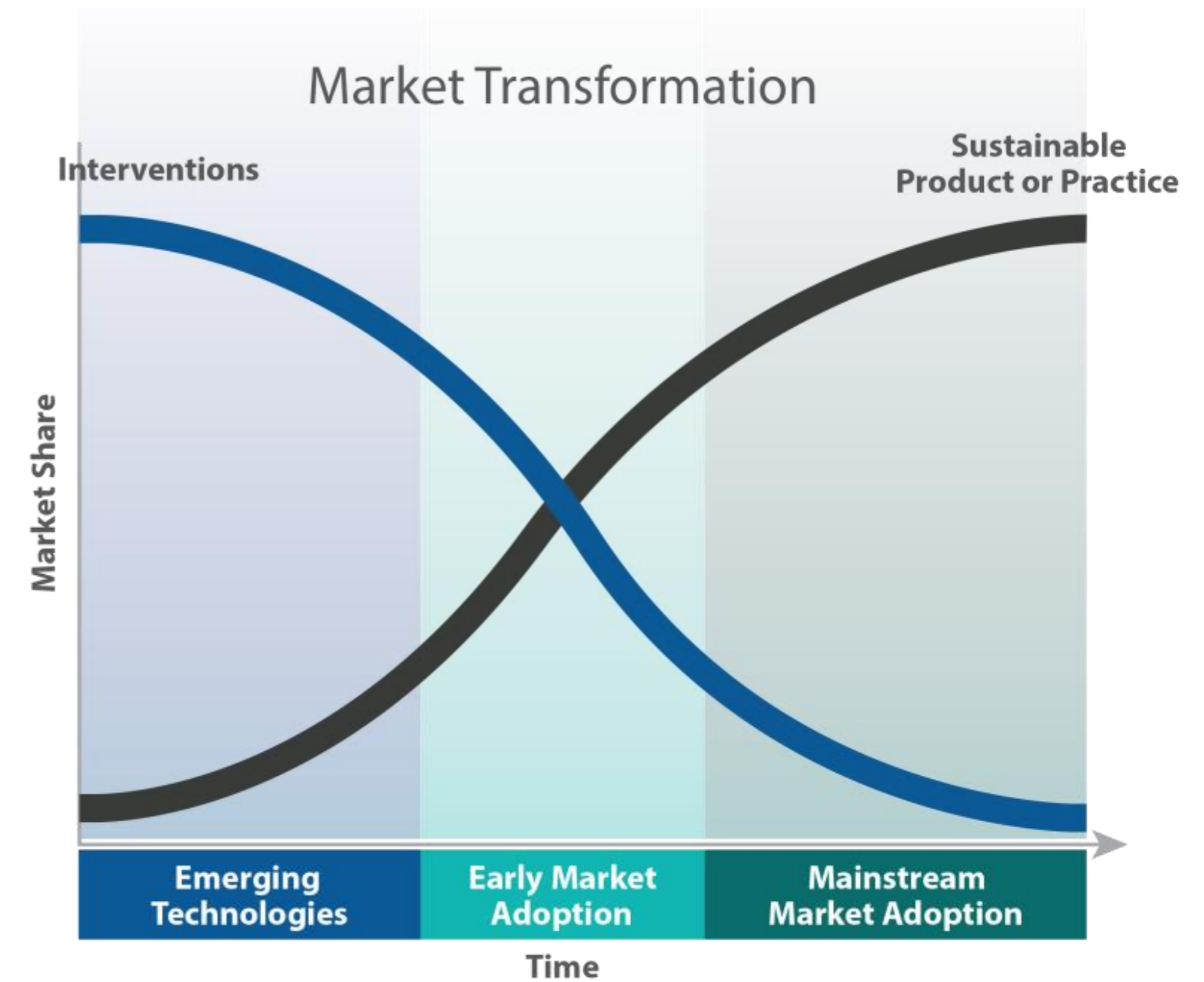
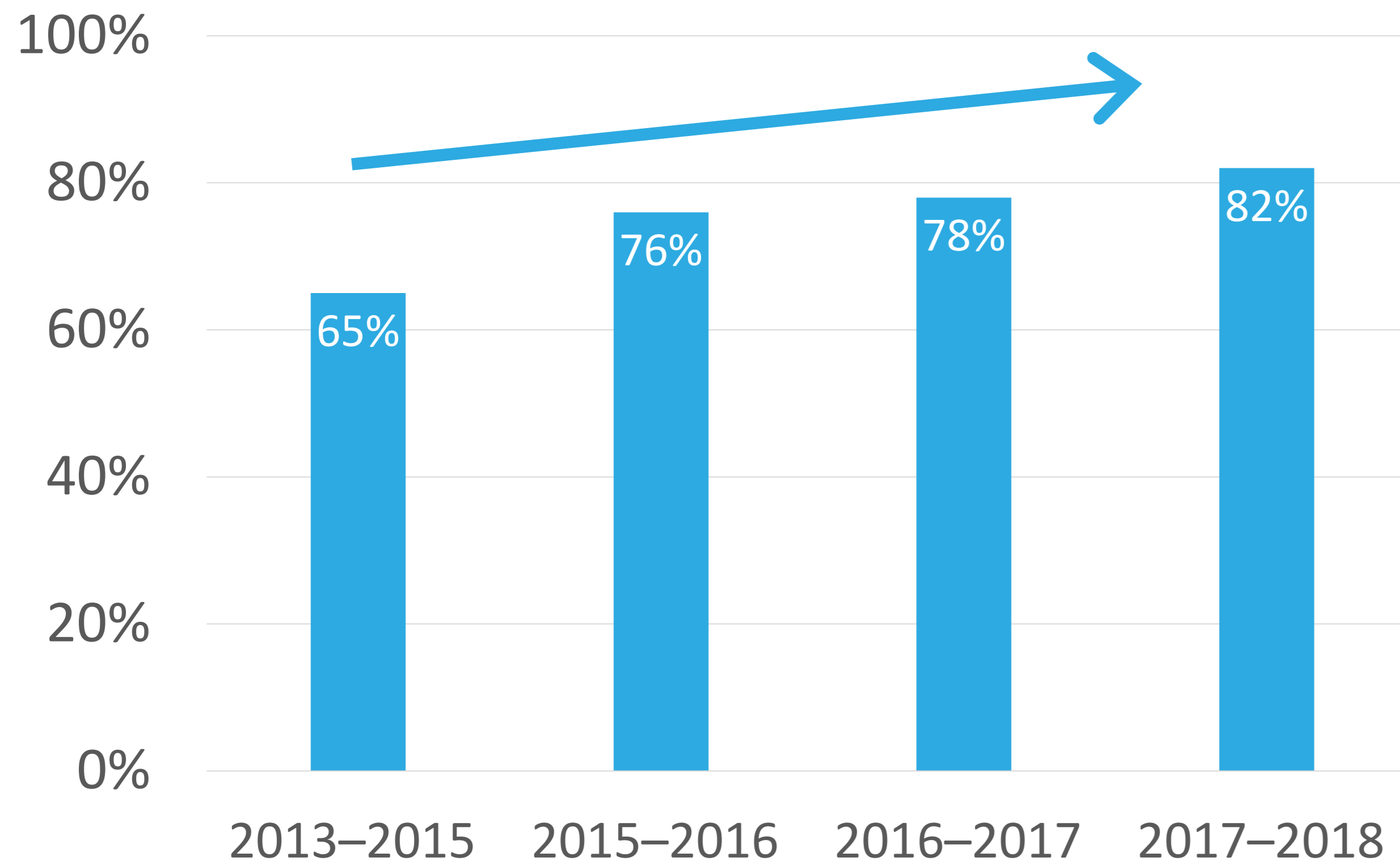


# Vehicle Replacement is *Increasing* Over Time, Contradicting a Common Paradigm About Phasing Out Incentives

Replaced a vehicle with their *plug-in EV*

≠

Common paradigm

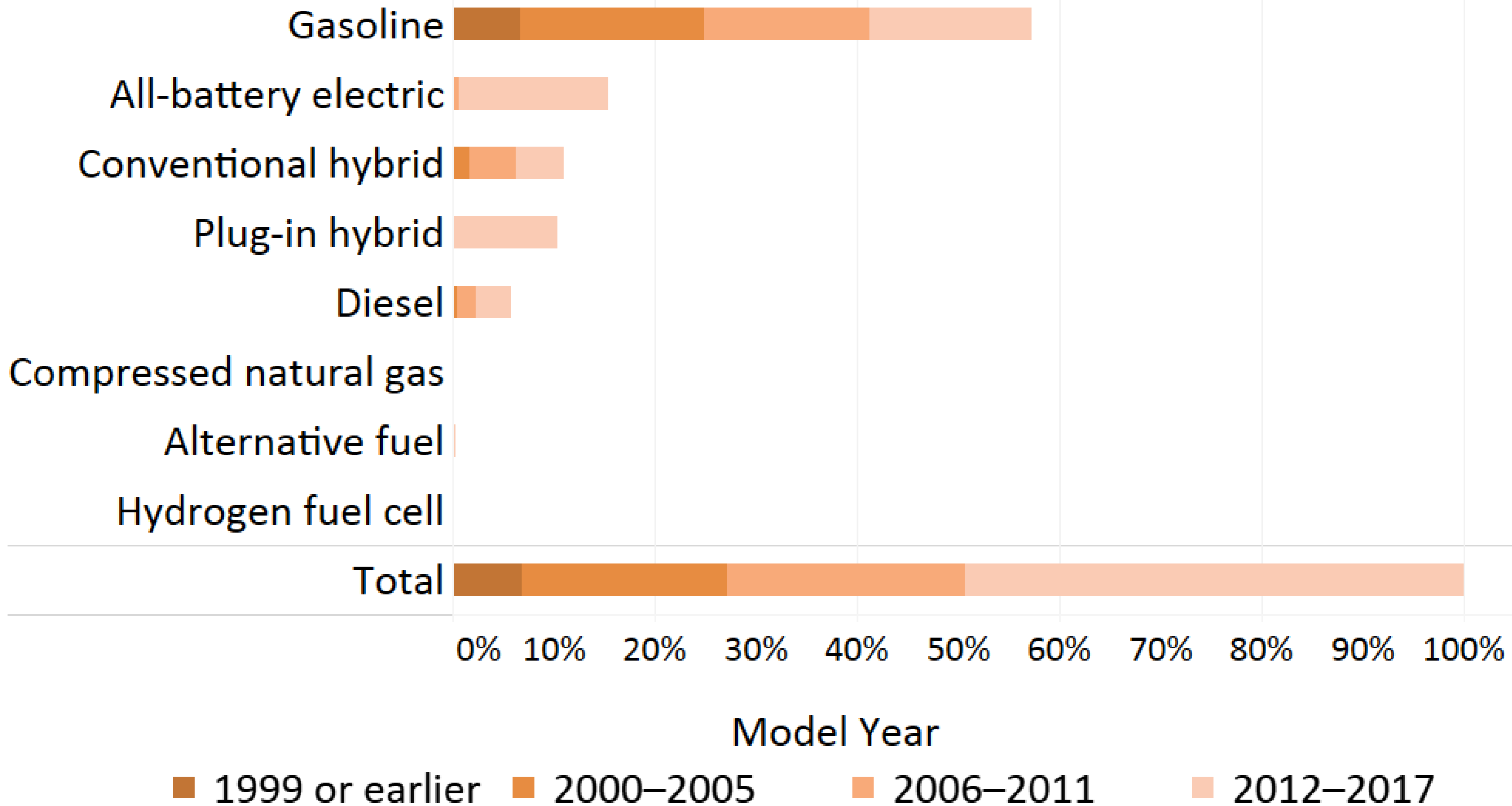


CVRP Consumer Survey: 2013–2015 edition: weighted, question n=19,247;  
 2015–2016 edition: weighted, question n= 11,583;  
 2016–2017 edition: weighted, question n= 9,006;  
 2017–2018 edition: weighted, question n= 20,847



# Impacts: Emission

# What Vehicles Types Have Rebates Helped Replace?

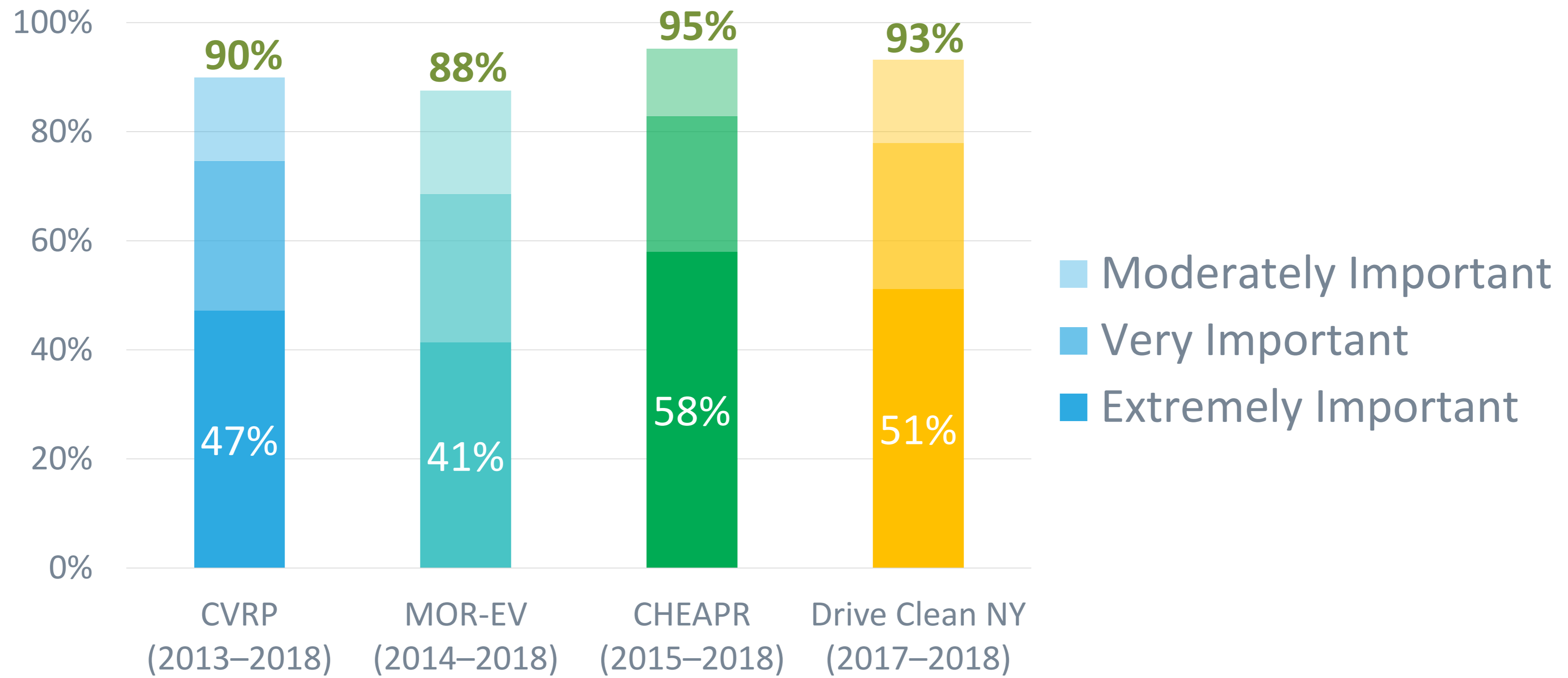




# Impacts: Market

# Rebate Influence: Importance

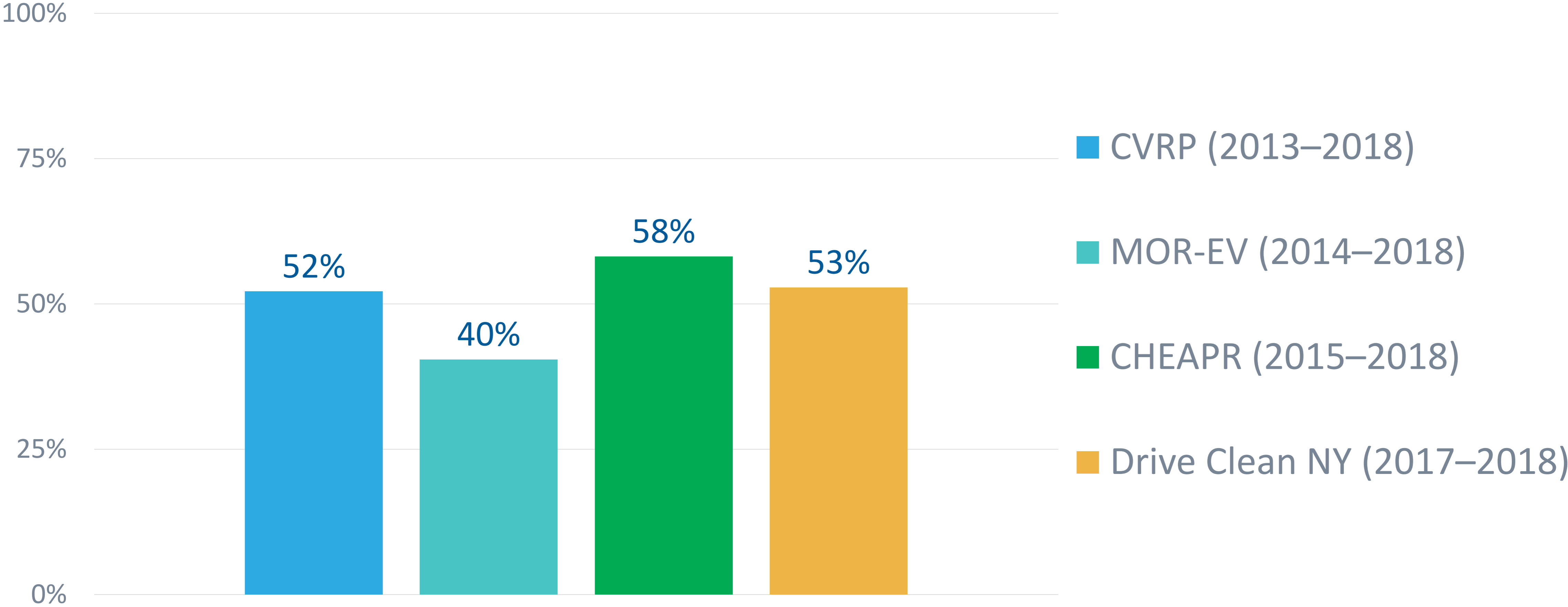
How **important** was the state rebate in **making it possible** for you to acquire your clean vehicle?



Overall datasets: 70,020 total survey respondents weighted to represent 301,619 rebate recipients

# Rebate Influence: Essentiality











Would **not** have purchased/leased their clean vehicle **without rebate**



Overall datasets: 70,020 total survey respondents weighted to represent 301,619 rebate recipients

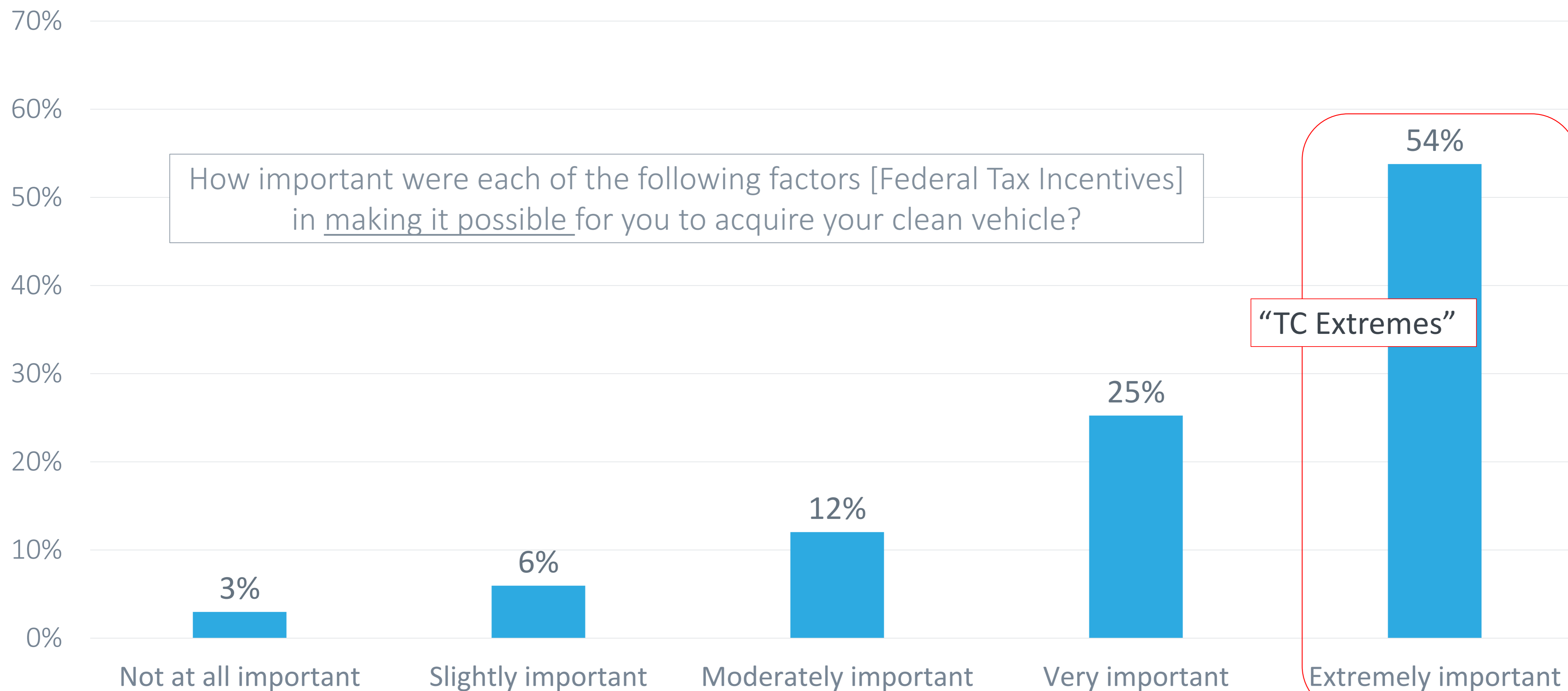
# Federal Tax Credit: Background

- Up to \$7,500 for the purchase or lease of a plug-in electric vehicle (PEV)\*
  - Credit amount decreases on the second calendar quarter after a manufacturer has sold 200,000...

Tesla Motors		1/1/10 to 12/31/18	1/1/19 to 6/30/19	7/1/19 to 12/31/19	
	2012–19 Model S	EV	\$7,500	\$3,750	\$1,875
	2016–19 Model X	EV	\$7,500	\$3,750	\$1,875
	Model 3 Standard Range Plus	EV	\$7,500	\$3,750	\$1,875
	2017–19 Model 3 Long Range	EV	\$7,500	\$3,750	\$1,875
	2019 Model 3 Long Range AWD and AWD Performance	EV	\$7,500	\$3,750	\$1,875
	2018–19 Model 3 Mid Range	EV	\$7,500	\$3,750	\$1,875
	2008–11 Roadster	EV	\$7,500	\$3,750	\$1,875
Chevrolet		1/1/10 to 3/31/19	4/1/19 to 9/30/19	10/1/19 to 3/31/20	
	2017–19 Chevrolet Bolt EV	EV	\$7,500	\$3,750	\$1,875
	2011–19 Chevrolet Volt	PHEV	\$7,500	\$3,750	\$1,875
	2014–16 Chevrolet Spark EV	EV	\$7,500	\$3,750	\$1,875

\* Light-duty plug-in electric vehicles, including both plug-in hybrid EVs (PHEVs) and battery EVs (BEVs)  
 Images taken 8/16/19 from <https://www.fueleconomy.gov/feg/taxevb.shtml>

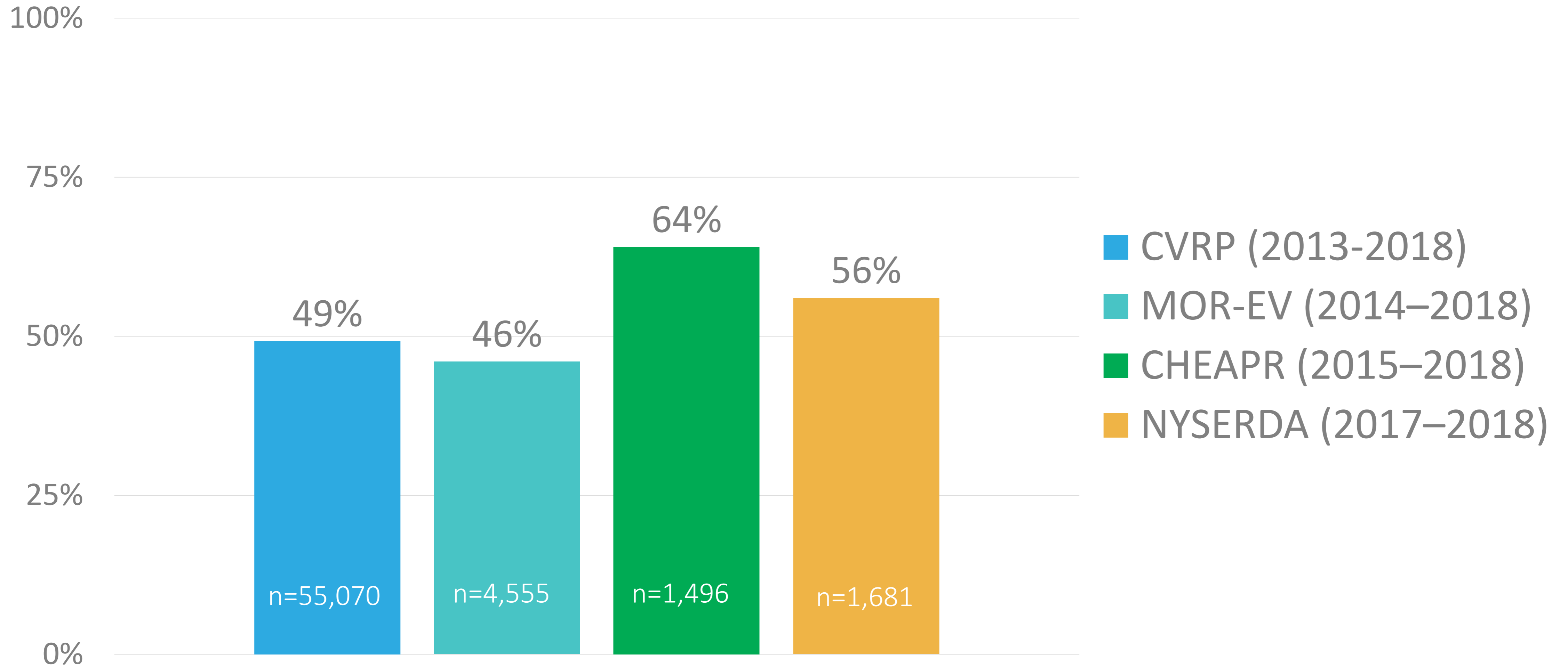
# Importance of Federal Tax Credit (2017–18 survey edition)





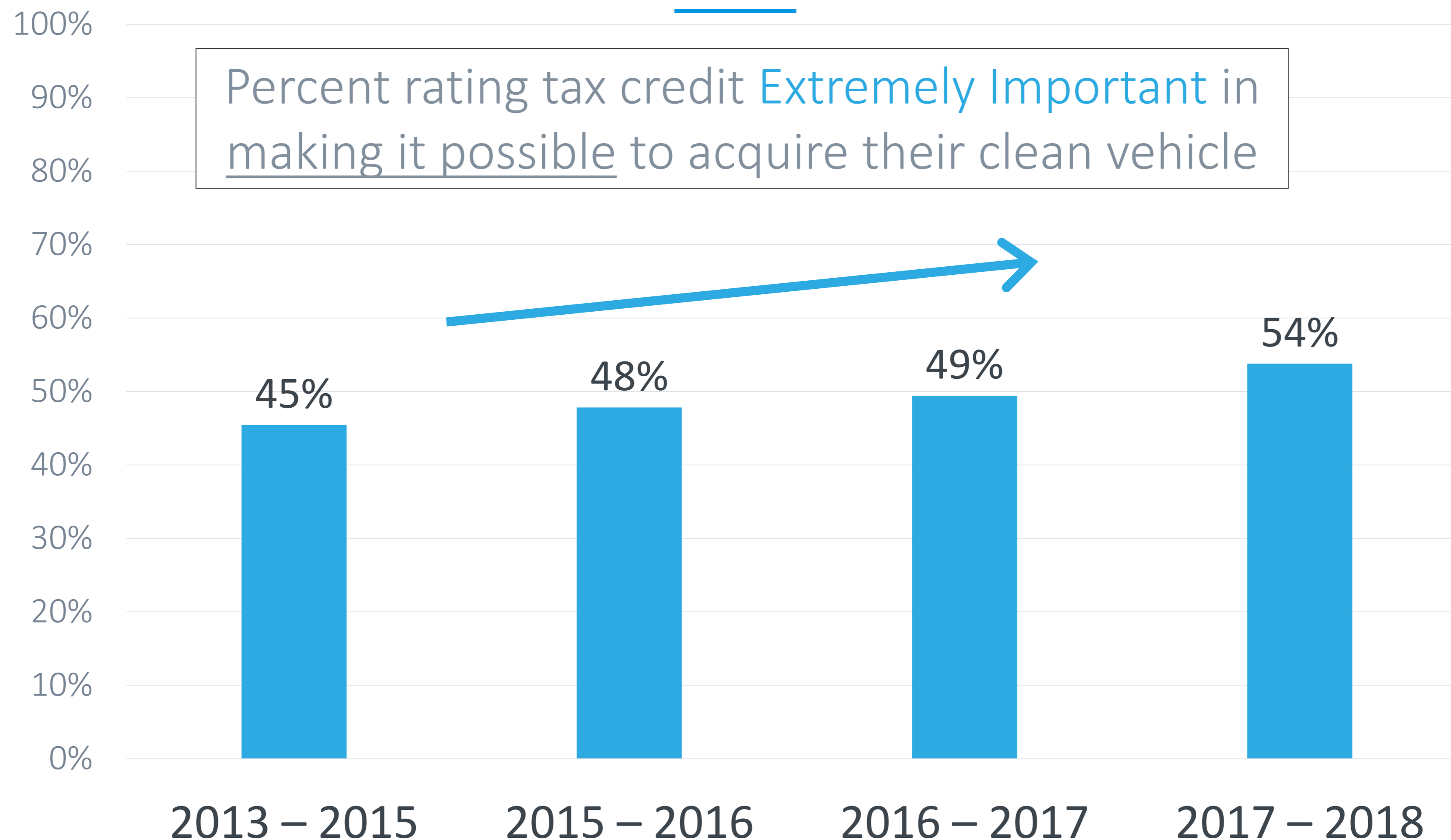
# Percent Rating the Federal Tax Credit “Extremely Important”

*(“...in making it possible to acquire” plug-in EVs)*



Overall datasets: 70,020 total survey respondents weighted to represent 301,619 rebate recipients

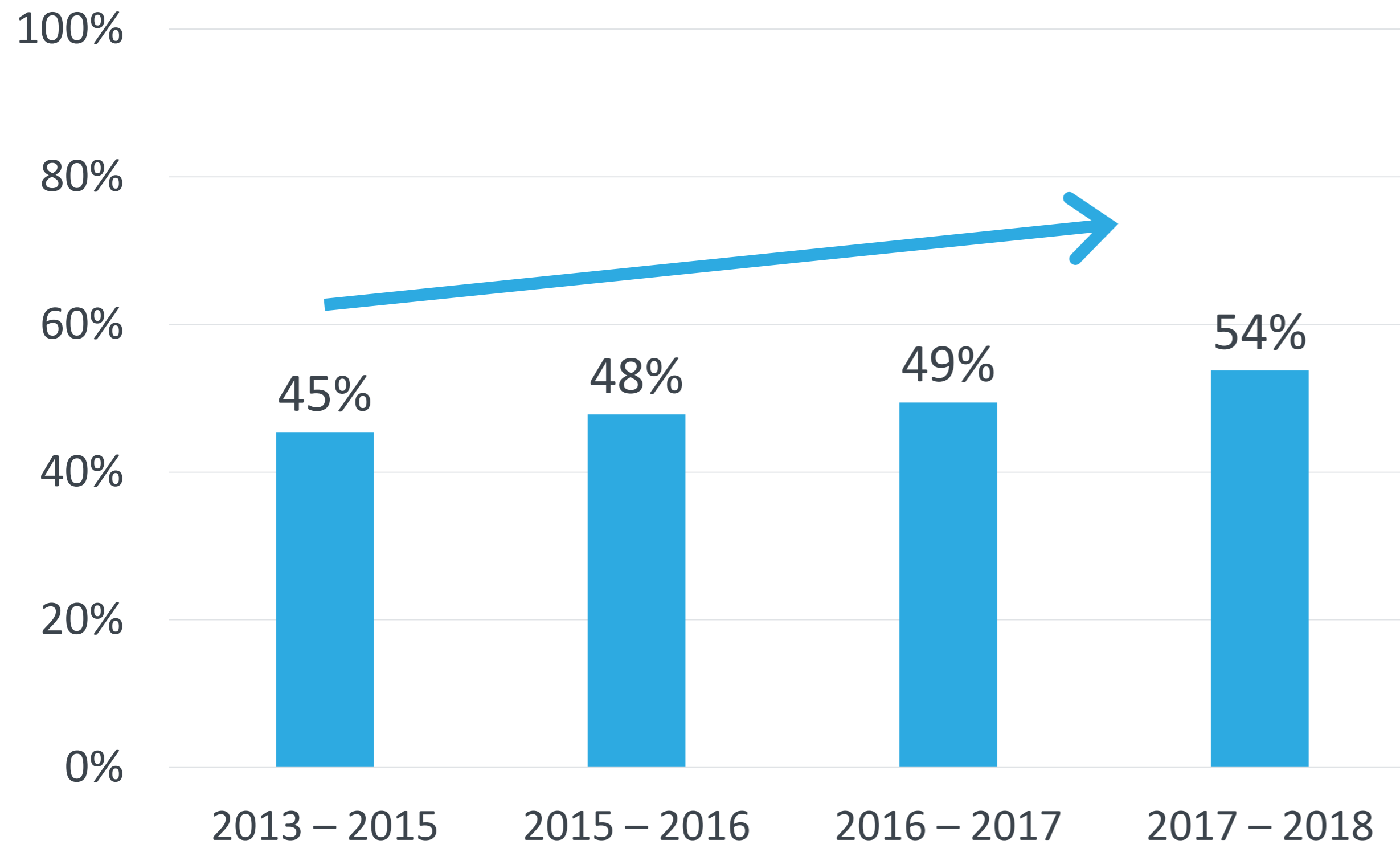
# Extreme Importance of Federal Tax Credit is Increasing



CVRP Consumer Survey: 2013–15 edition weighted n = 18,967, 2015–16 edition weighted n = 10,724, 2016–17 edition weighted n = 8,278; 2017–18 edition weighted n = 17,101

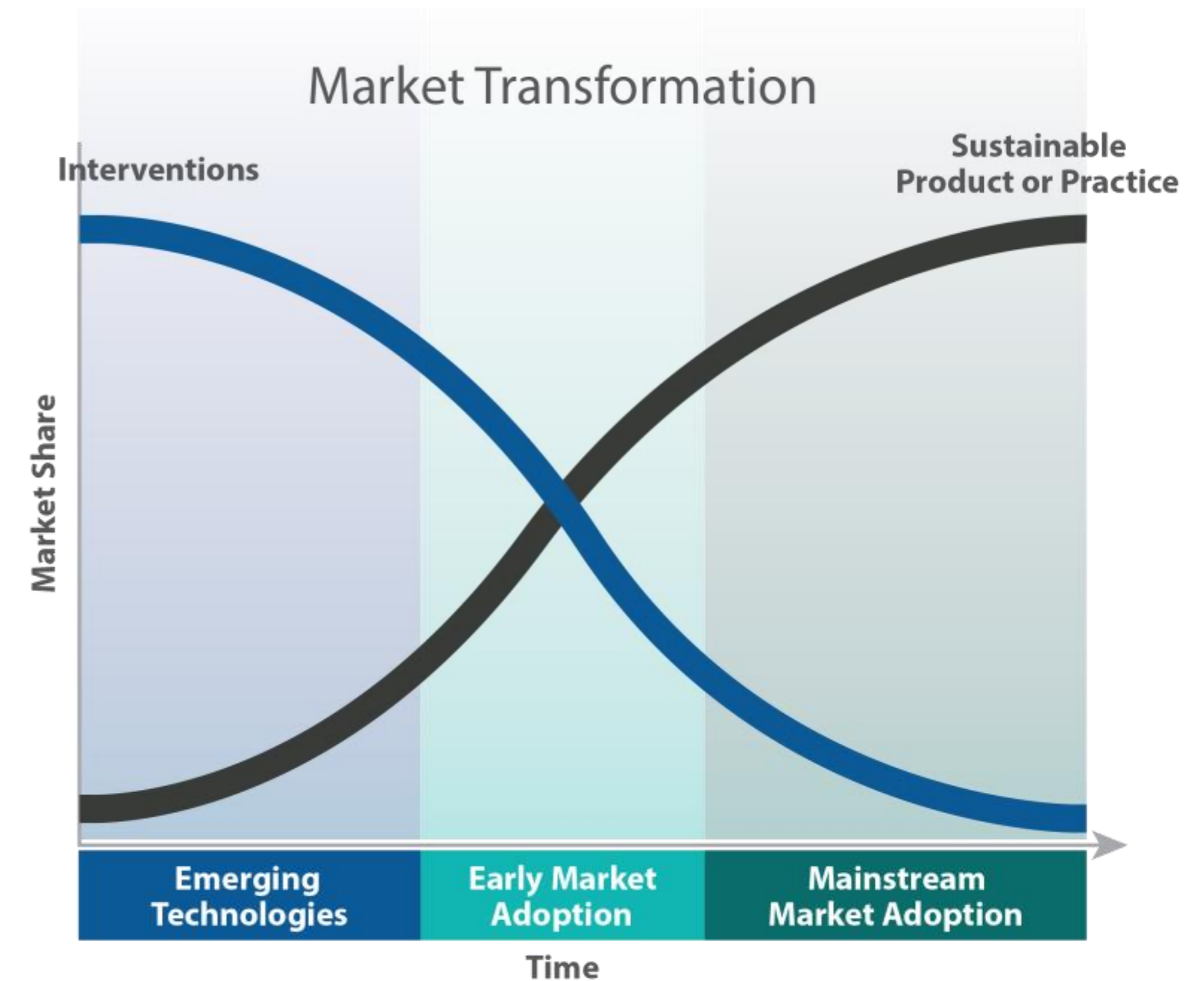
# Fed Tax Incentive Importance is *Increasing* Over Time, Contradicting a Common Paradigm About Phasing Out Incentives

## Fed Tax Incentive Extreme Importance



≠

## Common paradigm



CVRP Consumer Survey: 2013–15 edition weighted n = 18,967, 2015–16 edition weighted n = 10,724, 2016–17 edition weighted n = 8,278; 2017–18 edition weighted n = 17,101





A close-up photograph of a hand plugging a charging cable into the charging port of an electric vehicle. The scene is set at sunset, with warm, golden light and lens flare effects. The background is slightly blurred, showing a city street with buildings and a bicycle.

# Additional Design Considerations

Income and MSRP caps, Program-Change Analysis and Supporting Data

# EV Rebate Designs (as of Sept. 2018), Reflective of most of the data gathered



	CALIFORNIA CLEAN VEHICLE REBATE PROJECT™	MOR-EV Massachusetts Offers Rebates for Electric Vehicles	CHEAPR Connecticut Hydrogen and Electric Automobile Purchase Rebate	NEW YORK STATE
<b>Fuel-Cell EVs</b> 	\$5,000	\$2,500	\$5,000	<u>e-miles</u>
<b>All-Battery EVs</b> 	\$2,500	\$2,500	<u>e-miles</u> ≥ 175      \$3,000 ≥ 100      \$2,000 < 100      \$500	≥ 120      \$2,000 ≥ 40      \$1,700 ≥ 20      \$1,100 < 20      \$500
<b>Plug-in Hybrid EVs</b> 	\$2,500 (i3 REx) \$1,500	≥10 kWh    \$2,500 <10 kWh    \$1,500	≥ 40      \$2,000 < 40      \$500	
<b>Zero-Emission Motorcycles</b> 	\$900	\$750		

- e-miles ≥ 20 only
- Consumer income cap
- increased rebates for lower-income households

- Base MSRP ≥ \$60k = \$1,000 max.
- no fleet rebates

Program ended 9/30/19

- Base MSRP ≤ \$60k only
- dealer assignment
- \$150 dealer incentive (\$300 previous)

- Base MSRP > \$60k = \$500 max.
- point-of-sale via dealer





CVRP	Eligibility		Rebate Amount			
	Filing Status	Gross Annual Income	FCEV	BEV	PHEV	ZEM
Income Cap	Individual	> \$150,000	\$5,000 (unless received an HOV sticker)	Not Eligible		
	Head of Household	> \$204,000				
	Joint	> \$300,000				
Standard Rebate	Individual	300% FPL to \$150,000	\$5,000	\$2,500	\$1,500	\$900
	Head of Household	300% FPL to \$204,000				
	Joint	300% FPL to \$300,000				
Increased Rebate for Low-Income Applicants*	Household Income ≤ 300 percent of the federal poverty level (FPL)		\$7,000	\$4,500	\$3,500	

# Income-Based Eligibility: Implementation Considerations

- Dealer reluctance, fears about liability
- Outreach complexity, consumer confusion
- Application complexity, affects all applicants
- Intrusiveness, tax forms
- Wait times, even for priority applicants
- Investment in processing systems, **labor**
- Fraud
- Loopholes
- **Precludes a point-of-sale rebate**, which would benefit those that need the rebate most

Point-of sale rebates with MSRP caps *may* better support equity goals...  
Supplemented with *Increased Rebates* based upon income criteria

# Differing Approaches, Similar Metrics...

	“Buying Age” 21+ Years Old U.S. Population (Census 2017)	New-Vehicle Buyers U.S. MYs 2016–17 (2017 NHTS)	 CY 2017 weighted n = 9,539	 Massachusetts Offers Rebates for Electric Vehicles CY 2017 weighted n = 1,285	 CY 2017 weighted n = 501	 Mar. – Dec. 2017 weighted n = 1,014
Selected solely White/Caucasian	65%	74%	58%	85%	88%	86%
≥ 50 Years Old	47%	51%	52%	61%	59%	60%
≥ Bachelor’s Degree	30%*	56%*	82%	90%	85%	73%
Own Residence	64%	75%	79%	92%	89%	90%
≥ \$150k HH Income	12%	23%	40%	58%	41%	34%
Selected Male	49%	51%	72%**	74%	71%	68%

“Prefer not to answer,” “I don’t know,” and similar responses are excluded throughout.

Census 2017: 2013–2017 American Community Survey, <http://factfinder2.census.gov>.

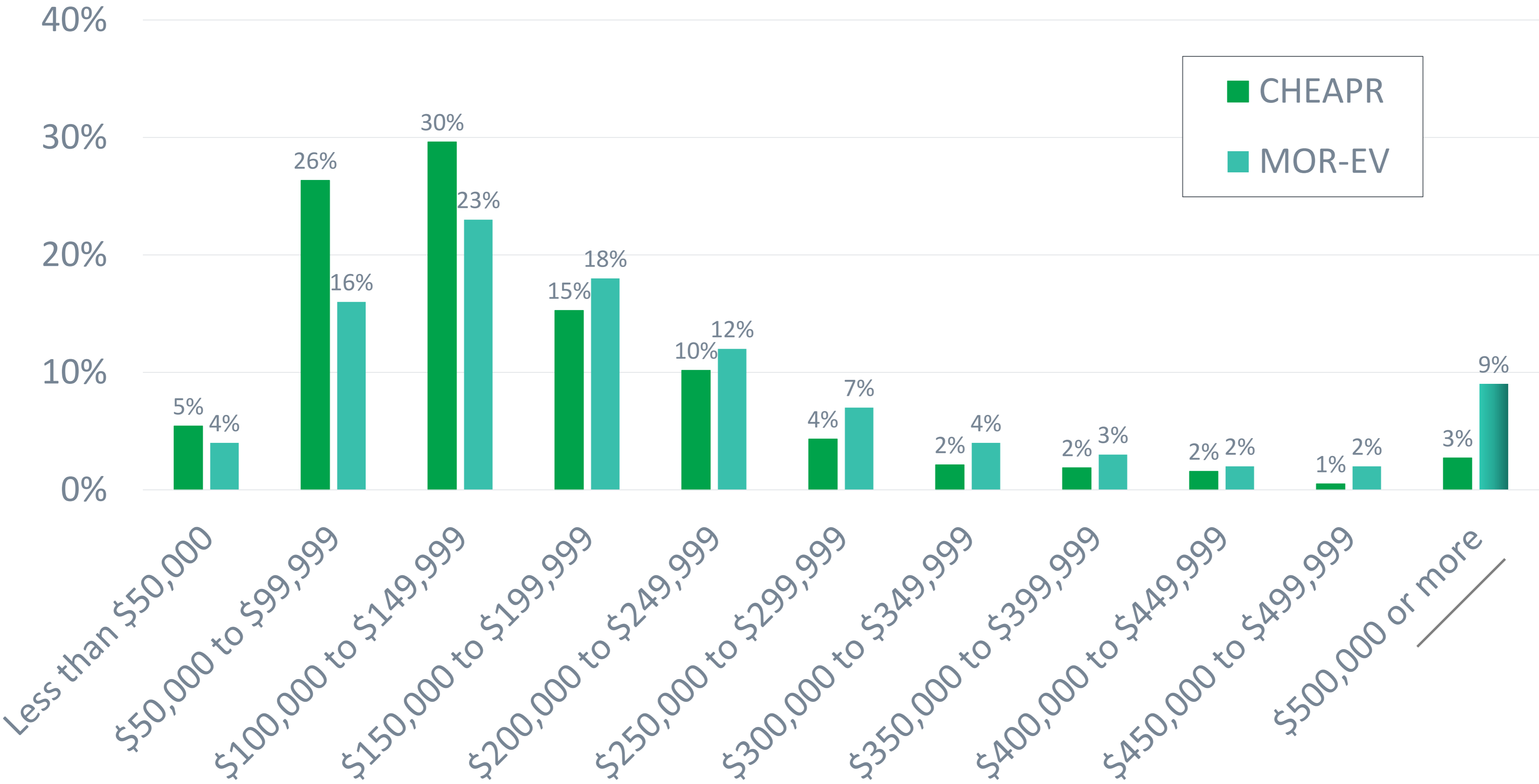
NHTS weighted to represent population, not new-vehicle subset. New-vehicle buyers identified based on within-100-mile match between odometer and miles driven while owned.

\* Census & NHTS data characterize individual educational attainment, whereas other data characterize highest household attainment.

\*\* 100% includes non-binary options.



# CHEAPR and MOR-EV Respondents by Household Income



# Program-Change Estimates: Methodology and Data Inputs

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# Program-Change Levels Explored

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- MSRP Cap (FCEV exempt)  
\$60k, \$50k, \$40k
- UDDS All-Electric Range (AER) Minimum  
>25, >30, >40, >50, >100
- Income Cap (FCEV exempt)  
Tax-filing status: \$250k, \$204k, \$150k
- Application limitations  
Limit one per person, limit three months to apply
- Rebate amounts  
-\$500 for standard rebates, no Standard Rebates, no PHEV rebates, no Standard PHEV rebates

# Supporting Data

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- MSRP Cap (FCEV exempt)  
\$60k, \$50k, \$40k
- UDDS All-Electric Range (AER) Minimum  
>25, >30, >40, >50, >100
- Income Cap (FCEV exempt)  
Tax-filing status: \$250k, \$204k, \$150k
- Application limitations  
Limit one per person, limit three months to apply
- Rebate amounts  
-\$500 for standard rebates, no Standard Rebates, no PHEV rebates, no Standard PHEV rebates

# Electric Vehicles by Base MSRP

Key
> \$60,000
\$50,000–\$59,999
\$40,000–\$49,999

\* Indicates model year 2018, all others model year 2019

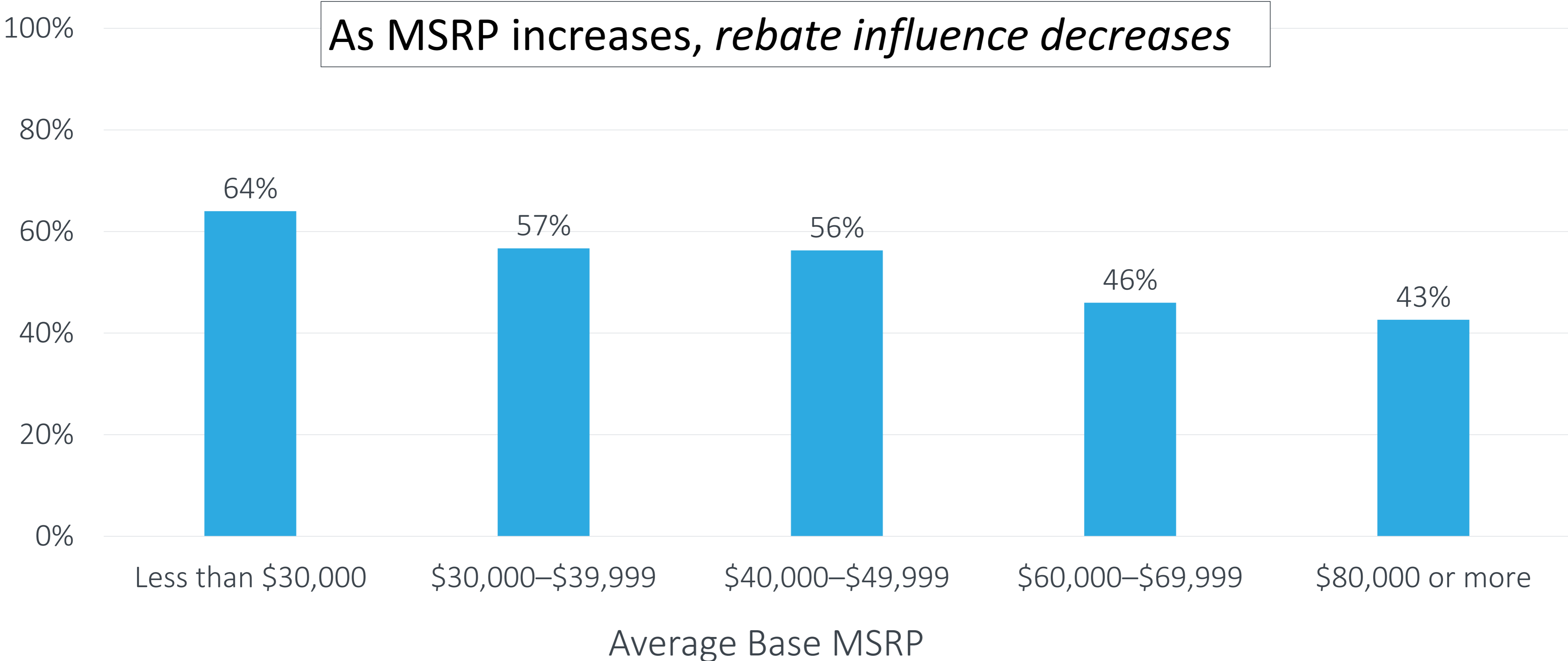
Base Manufacturer's Suggested Retail Price (MSRP) sources: Manufacturer websites, FuelEconomy.gov, Kelley Blue Book

Note: FCEVs, discontinued PEVs, and motorcycles not included.

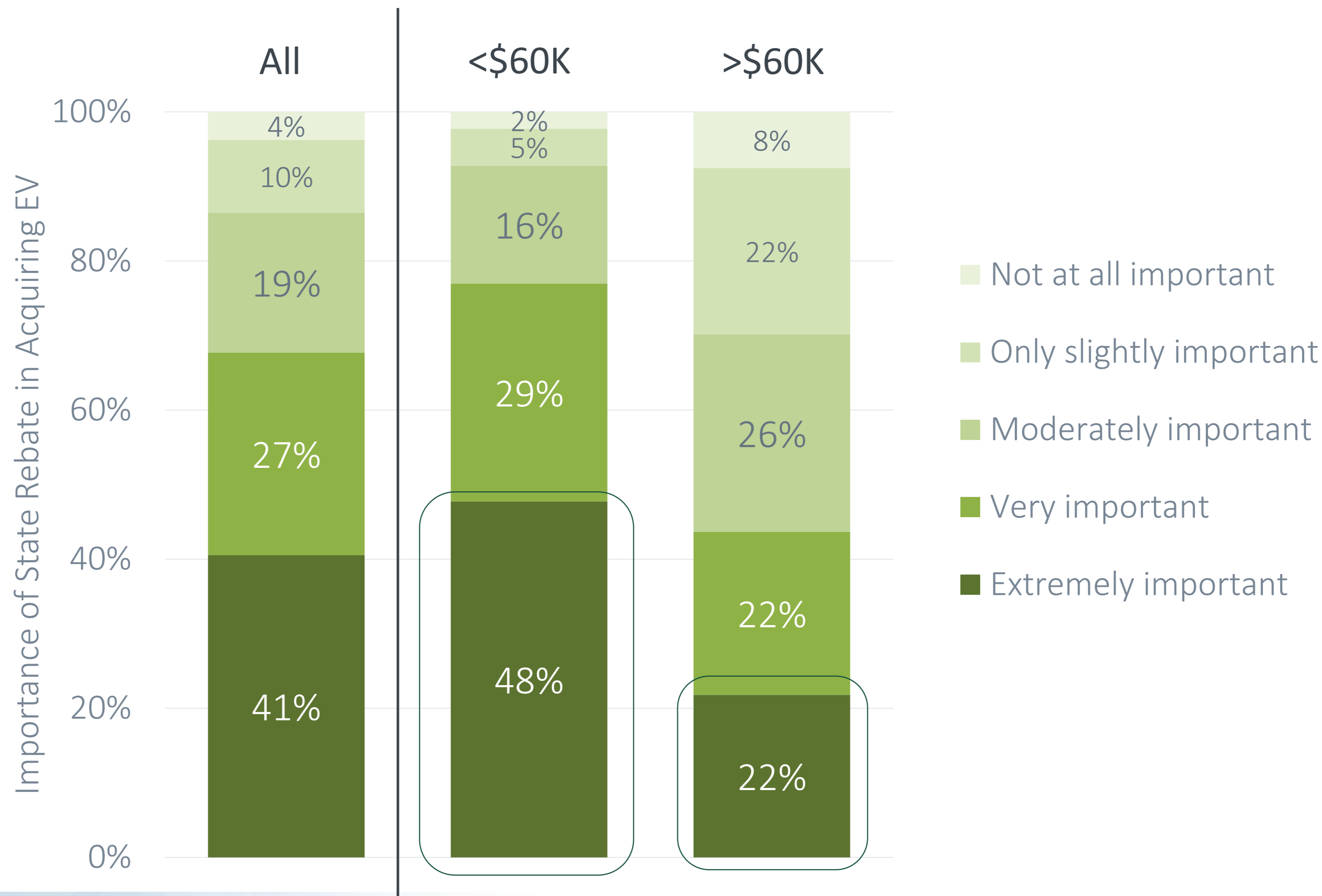


Vehicle Make and Model	Base MSRP
BMW 530e xDrive iPerformance	\$55,700
Audi A3 e-tron*	\$39,500
BMW 530e iPerformance	\$53,400
Volvo XC60 T8	\$55,300
Volvo XC90 T8	\$67,000
Volvo S90 T8	\$63,900
Mitsubishi Outlander PHEV	\$34,595
Toyota Prius Prime	\$27,350
Ford Fusion Energi	\$34,595
Kia Niro Plug-in Hybrid	\$28,500
Hyundai Sonata Plug-in Hybrid	\$32,400
Hyundai Ioniq PHEV	\$25,350
Kia Optima Plug-in Hybrid	\$35,390
Chrysler Pacifica	\$39,995
Honda Clarity Plug-In Hybrid	\$33,400
smart Electric Fortwo Cabriolet	\$28,100
smart Electric Fortwo Coupe	\$23,900
FIAT 500e	\$32,995
Honda Clarity Electric	\$37,540
BMW i3 REX*	\$48,300
Kia Soul EV	\$33,950
Ford Focus Electric*	\$29,120
Hyundai Ioniq Electric	\$30,315
Volkswagen e-Golf	\$30,495
BMW i3s REX	\$51,500
Nissan LEAF	\$29,990
BMW i3	\$44,450
BMW i3s	\$47,650
Nissan LEAF Plus	\$36,550
Jaguar I-PACE	\$69,500
Chevrolet Bolt	\$36,620
Tesla Model X	\$88,000
Hyundai Kona Electric	\$36,450
Tesla Model 3 (Medium-range)	\$47,990
Tesla Model S	\$85,000

# Rebate Essentiality Reflects Interesting Trends

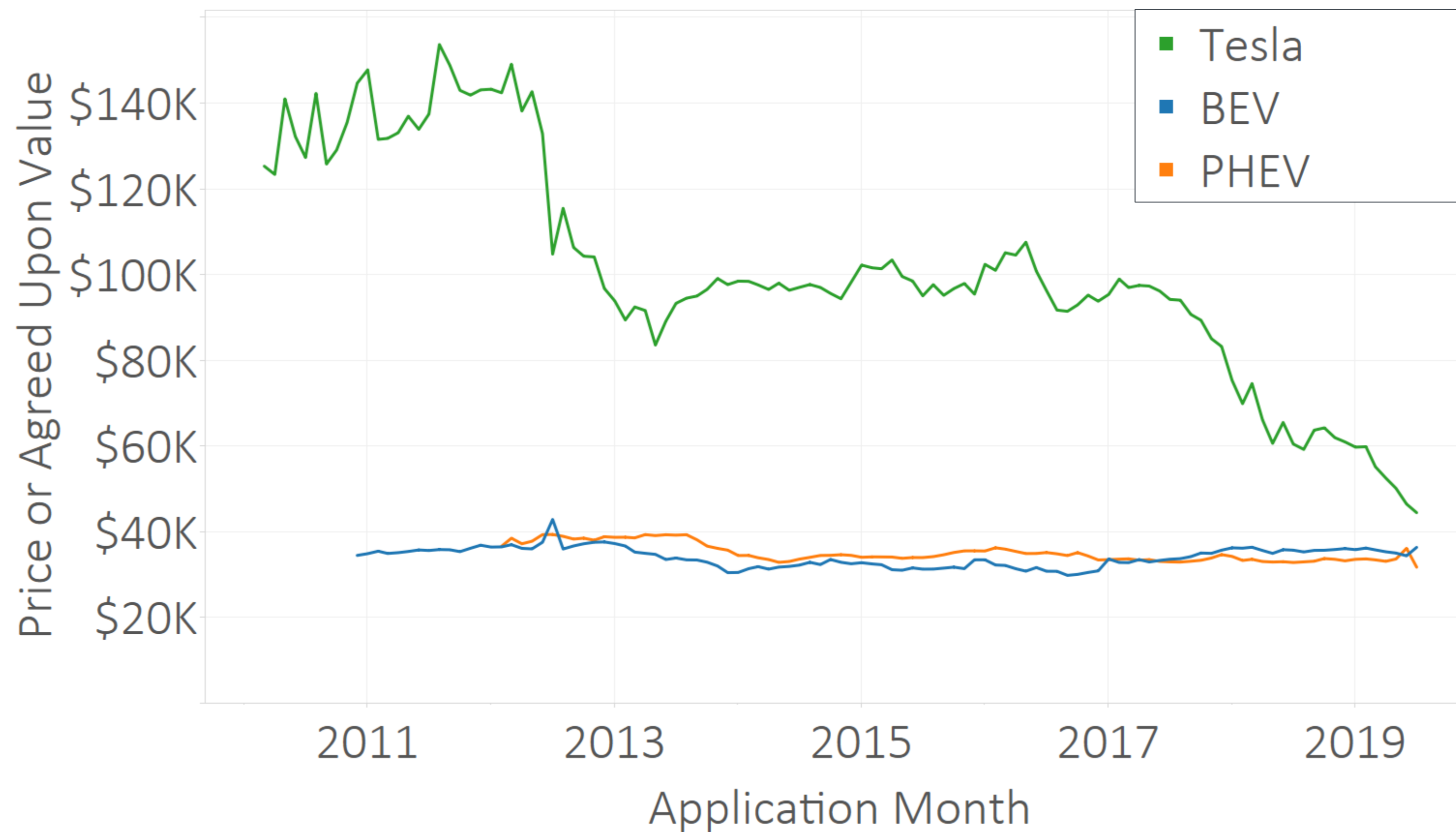


# Rebate Importance by Vehicle Price



MOR-EV Survey, 2014–17: n = 2,549 total respondents weighted to represent N = 5,754 participants  
Excludes one response missing price data.

# Average Rebated-Vehicle Purchase Price Remains Steady for non-Tesla Vehicles



As of 7/12/2019



A close-up photograph of a hand plugging a charging cable into the charging port of a light-colored electric vehicle. The scene is set outdoors at sunset, with a bright sun in the upper right corner creating a lens flare effect. In the background, a parking lot with other vehicles and a building is visible. A semi-transparent white banner is overlaid across the middle of the image, containing the text 'Dealer Incentives'.

# Dealer Incentives

# How is the Dealer Incentive Working?

## Evaluating the Connecticut Dealer Incentive for Electric Vehicle Sales

April 2017

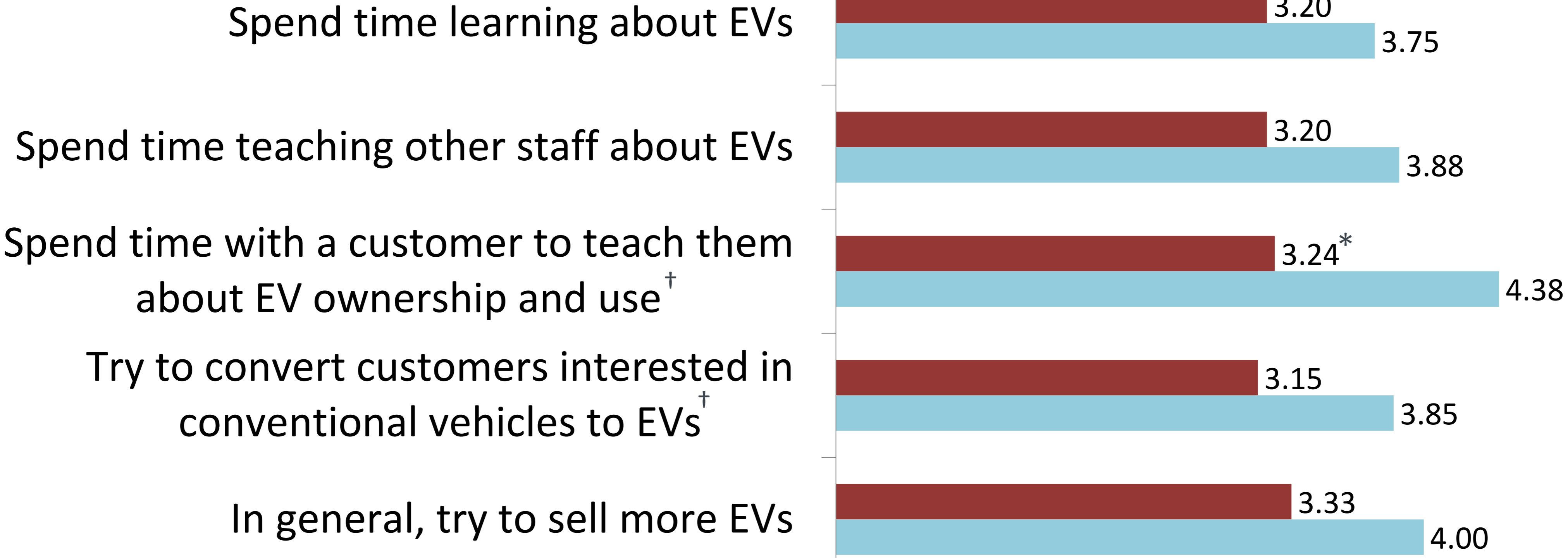
Prepared by  
Center for Sustainable Energy



# “To what extent are you motivated by the current dealer incentive to do each of the following?”

■ Have Never Owned an EV  
■ Have Owned an EV

Not at all motivated    Slightly motivated    Moderately motivated    Very motivated    Extremely motivated



Respondents=57

<sup>†</sup> Fourth and fifth statements only appeared to sales employees; respondents=40

\*Statistically significant difference (p < 0.05)



A close-up photograph of a person's hand plugging a charging cable into an electric vehicle. The scene is set during sunset, with warm, golden light and lens flare effects. The background shows a blurred city street with buildings and other vehicles.

# Musings for Maryland

Tax vs. Cash Incentives, Program Design, Complementary Policies and Programs

# Potential Disadvantages of Tax Incentives

---

- Equity challenges
  - Consumers who need incentives most often:
    - Lack tax liability\*, upfront capital, and financing
    - Are overburdened by tax-planning uncertainty and complexity
    - Can't float the incentive until tax time
  - Risks: Benefits biased toward free riders with resources, not mainstream
- Dealer's disengage due to uncertainties, complexities, fear of liability
- General-fund tax expenditures can
  - Compete directly with core services (“fire-fighters and teachers”)
  - Be less transparent than state appropriation processes
  - Be less directly tied to revenue source (e.g., taxpayer desires to spend transportation funds on transportation services, etc.)

\* Or, in the case of excise taxes, the typical vehicles purchased may not be subject to an excise tax large enough to max out the credit (e.g., in the case of a 6% excise tax, it would take a \$50k purchase price to receive a \$3,000 maximum credit, regardless of battery size)

# Potential Advantages of Cash Incentives

---

- Equity, dealer, and general-fund challenges (previous slide) solved, particularly by point-of-sale rebates
- 3 Pillars of Successful Program Administration:
  - Outreach increases widespread awareness of EVs
  - Simple application and (multi-lingual) customer support facilitates participation by priority populations
  - Program tracking and evaluation provide: transparency, ongoing and adaptive program improvement, and market intelligence that empowers stakeholders throughout the EV ecosystem
- Indications in the research literature suggest rebates might be significantly more effective than tax credits, and point-of-sale rebates even more so

# Program Design Recommendations: Consider...

---

- **Vehicle eligibility**: base MSRP (vehicle simply on or off posted list), not upon case-by-case purchase price
- **Rebate amounts**: EPA all-electric range thresholds (fuelconomy.gov), not complex kWh calculations
- **Strategic outreach** based upon program data to **cost-effectively target highly-influenced and mainstream consumers**: “Rebate Essentials” and “EV Converts”
- **Incentive types**:
  1. **Point-of-sale cash rebate** to improve **effectiveness** and **equity, engage dealers**
  2. **Dealer sales incentive** (like a “SPIFF” for the dealership and salesperson) to **leverage dealer outreach** and **motivate sales**
- **Application and Support**: **Simple online application** and rapid **reimbursement** of dealers
- **Program Transparency**:
  - **Dashboards** to show **availability of funds**, rebate **stats**, **consumer-survey** responses and **program impacts** (vehicles added, GHGs avoided)
  - **Internal evaluation** to **guide outreach**, **refine implementation**, and **support planning** (including **projections**)

# Complimentary Programs & Policies

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- Three primary nutrients of for EV demand:
  - 1) upfront purchase/lease subsidies, 2) awareness campaigns, and 3) charging infrastructure
  - Need at least a little of each, else market “starves” and other nutrients become ineffective
- Other polices:
  - Cap-and-invest (e.g., TCI)
  - EV Supply (ZEV regs)
  - Low-carbon fuel standards (LCFS)
  - Fee-bates (potentially revenue-neutral)
  - HOV-lane access and other perks



A close-up photograph of a person's hand plugging a charging cable into the charging port of a light-colored electric car. The scene is set outdoors at sunset, with warm, golden light and lens flare effects. In the background, a public charging station with multiple charging cables is visible, along with a bicycle parked nearby. The overall atmosphere is clean and modern, representing sustainable transportation.

# Wrap Up, Additional Resources & Details

# Select Findings: Program Impacts

---

- Some consumer differences, particularly gender, remain
  - Trending in the right direction
  - Segmentation can support market-acceleration, cost-effectiveness, or mainstreaming, or equity goals
- ~ 4/5<sup>ths</sup> of rebated EVs replace older, more polluting vehicles
- Avoiding > 30 tons of GHG emissions per vehicle (12-year life) at costs <\$100/ton
- Rebate influence on purchase/lease:
  - moderately to extremely important to 9/10<sup>ths</sup>
  - essential to > 1/2
- Indicators of impact are increasing over time
- Programs with MSRP caps and cash on the hood may support equity as well as, or better than, programs with income caps. *Supplement* with Increased Rebates based on income, as needed.
- Dealer sales incentives motivate EV salespeople, particularly those with prior EV ownership experience



# Additional Resources & Details

# CSE Clean Transportation Resources

Reports, analysis,  
infographics,  
presentations, ...

The screenshot shows the 'Research and Reports' page on the Center for Sustainable Energy website. The page features a navigation bar with links for 'Expertise', 'Core Values', 'Thought Leadership', and 'About Us'. The main heading is 'THOUGHT LEADERSHIP Research and Reports'. Below the heading is a search and filter interface with the following elements:


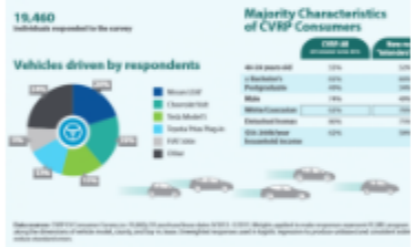




- Search Term:** An empty text input field.
- Resource Type:** A dropdown menu currently set to 'All Resources'.
- Technology:** A dropdown menu currently set to 'Clean Transportation'.
- Target Audience:** A dropdown menu currently set to 'Government'.
- Filter:** A blue button with a downward arrow icon.
- Reset:** A red button with a trash can icon.

Two resource entries are displayed below the filters:

- Entry 1:** A presentation icon followed by the title 'Presentation: "EV Rebates: Demographic Update, Program Design Features, and Paths Forward for Broadening Participation"'. The description reads: 'Provides equity metrics, demographics, program-design features, and outreach strategies from four state-wide incentive programs. Given to the ZEV Alliance webinar "Expanding Access Listening Series."'. The date 'Aug, 2019' is shown in the bottom right corner of the entry box.
- Entry 2:** A document icon followed by the title 'Summary of CVRP Rebate Eligibility and Funding Availability Over Time (Updated)'. The description reads: 'A fact sheet which details changes in Clean Vehicle Rebate Project rebate amounts, consumer-income eligibility criteria, and program funding availability over time'.

# Evaluation: CVRP Analysis

Program reports, fact sheets, infographics & presentations

	<b>Summary Documentation of the Electric Vehicle Consumer Survey, 2013-2015 Edition</b> June 15, 2017
	<b>Infographic: Characterizing California Electric Vehicle Consumer Segments - TRB Poster</b> January 16, 2017
	<b>Infographic: Plug-in Electric Vehicle Owners in California's Disadvantaged Communities</b> January 11, 2017
	<b>CVRP Final Report 2014-2015</b> November 21, 2016
	<b>Characterizing Plug-In Hybrid Electric Vehicle Consumers Most Influenced by CVRP</b> November 15, 2016
	<b>Presentation: "Electric Vehicle Rebates in Disadvantaged Communities: Evaluating Progress with Appropriate Comparisons"</b> October 26, 2016

# Select Pertinent Highlights *(Reverse Chronological)*

- [Additional Analysis of CVRP Funding Need and Program-Change Scenarios](#) (and predecessors linked on last slide)
- [“CVRP: Data and Analysis Update”](#)
- [Cost-Effectively Targeting EV Outreach and Incentives to “Rebate-Essential” Consumers](#)
- [Peer-Reviewed Conference Paper: “Strategically Targeting Plug-in Electric Vehicle Rebates and Outreach Using Characteristics of ‘Rebate-Essential’ Consumers in 2016–2017”](#) (update)
- ["Electric Vehicle Rebates: Exploring Indicators of Impact in Four States"](#)
- [Targeting EV Consumer Segments & Incentivizing Dealers](#)

# Select Pertinent Highlights, Cont. *(Reverse Chronological)*

- Report: Evaluating the Connecticut Dealer Incentive for Electric Vehicle Sales
- Supporting EV Commercialization with Rebates: Statewide Programs, Vehicle & Consumer Data, and Select Findings
- Yale Webinar: Supporting EV Commercialization with Rebates: Statewide Programs, Vehicle & Consumer Data, and Select Findings
- “CVRP Income Cap Analysis: Informing Policy Discussions”

# EV Rebate Designs

(As of Sept. 2018; Reflective of Most of the Data Gathered)



**Fuel-Cell EVs**



\$5,000

\$2,500

\$5,000

e-miles

≥ 120	\$2,000
≥ 40	\$1,700
≥ 20	\$1,100
< 20	\$500

**All-Battery EVs**



\$2,500

\$2,500

e-miles

≥ 175	\$3,000
≥ 100	\$2,000
< 100	\$500

**Plug-in Hybrid EVs**



\$2,500 (i3 REx)  
\$1,500

≥10 kWh \$2,500  
<10 kWh \$1,500

≥ 40	\$2,000
< 40	\$500

**Zero-Emission Motorcycles**



\$900

\$750

- e-miles ≥ 20 only
- Consumer income cap
- increased rebates for lower-income households

- Base MSRP ≥ \$60k = \$1,000 max.
- no fleet rebates

Program ended 9/30/19

- Base MSRP ≤ \$60k only
- dealer assignment
- \$150 dealer incentive (\$300 previous)

- Base MSRP > \$60k = \$500 max.
- point-of-sale via dealer



# State EV Rebate Programs Administered by CSE

(as of Jan. 2019; Oregon pending)



**Fuel-Cell EVs** 

\$5,000

\$1,500

\$5,000

e-miles

≥ 120	\$2,000
≥ 40	\$1,700
≥ 20	\$1,100
< 20	\$500

**All-Battery EVs** 

\$2,500

\$1,500

e-miles

≥ 200	\$2,000
≥ 120	\$1,500
< 120	\$500

**Plug-in Hybrid EVs** 

\$2,500 (i3 REx)  
\$1,500

BEVx only: \$1,500

≥ 45	\$1,000
< 45	\$500

**Zero-Emission Motorcycles** 

\$900

\$450

- ≥ 20 e-miles only
- Income cap
- Increased rebates for lower-income households

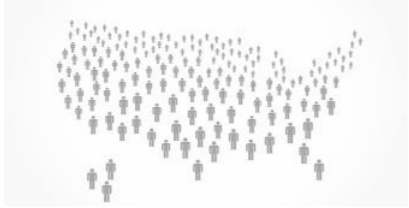




- Base MSRP ≤ \$50k
- No fleet rebates

Program ended 9/30/19

- BEVs & PHEVs ≤ \$50k base MSRP, FCEVs ≤ \$60k
- Point-of-sale option
- \$150 dealer incentive

- Base MSRP > \$60k = \$500 max.;
- Point-of-sale

# Rebated EV Consumer Characteristics: 2017

	 <b>All</b> U.S. Population (Census 2017)	<b>New-Vehicle Buyers</b> U.S. MYs 2016–17 (2017 NHTS)	 CALIFORNIA CLEAN VEHICLE REBATE PROJECT™ CY 2017 weighted n = 9,539	 MOR-EV Massachusetts Offers Rebates for Electric Vehicles CY 2017 weighted n = 1,285	 CHEAPR Connecticut Hydrogen and Electric Automobile Purchase Rebate CY 2017 weighted n = 501	 NEW YORK STATE Mar.–Dec. 2017 weighted n = 1,014
Selected solely White/Caucasian	61%	74%	58%	85%	88%	86%
≥ 50 Years Old	34%	51%	52%	61%	59%	60%
≥ Bachelor's Degree in HH	23%*	56%*	82%	90%	85%	73%
Own Residence	63%	75%	79%	92%	89%	90%
≥ \$150k HH Income	12%	23%	40%	58%	41%	34%
Selected Male	49%	51%	72%**	74%	71%	68%

*“Prefer not to answer,” “I don’t know,” and similar responses are excluded throughout.*





*Census 2017: 2013–2017 American Community Survey, <http://factfinder2.census.gov>.*

*NHTS weighted to represent population, not new-vehicle subset. New-vehicle buyers identified based on within-100-mile match between odometer and miles driven while owned.*

*\* Census & NHTS data characterize individual educational attainment, whereas other data characterize highest household attainment.*

*\*\* 100% includes non-binary options.*

# Rebated EV Consumer Characteristics

	<b>“Buying Age”</b> <i>21+ Years Old</i> U.S. Population (Census 2017)	<b>New-Vehicle Buyers</b> U.S. MYs 2016–17 (2017 NHTS)	 CALIFORNIA CLEAN VEHICLE REBATE PROJECT™ Dec. 2010 – Dec. 2018 weighted n = 62,092	 MOR-EV Massachusetts Offers Rebates for Electric Vehicles Jun. 2014 – Oct. 2018 weighted n = 4,555	 CHEAPR Connecticut Hydrogen and Electric Automobile Purchase Rebate May 2015 – Sep. 2018 weighted n = 1,565	 NEW YORK STATE Mar. 2017 – Jul. 2018 weighted n = 1,808
Selected solely White/Caucasian	65%	74%	59%	85%	87%	86%
≥ 50 Years Old	47%	51%	50%	58%	54%	59%
≥ Bachelor’s Degree in HH	30%*	56%*	83%	90%	83%	76%
Own Residence	64%	75%	83%	92%	89%	90%
≥ \$150k HH Income	12%	23%	47%	58%	43%	39%
Selected Male	49%	51%	74%**	78%	74%	70%

*“Prefer not to answer,” “I don’t know,” and similar responses are excluded throughout.*





*Census 2017: 2013–2017 American Community Survey, <http://factfinder2.census.gov>.*

*NHTS weighted to represent population, not new-vehicle subset. New-vehicle buyers identified based on within-100-mile match between odometer and miles driven while owned.*

*\* Census & NHTS data characterize individual educational attainment, whereas other data characterize highest household attainment.*

*\*\* 100% includes non-binary options.*

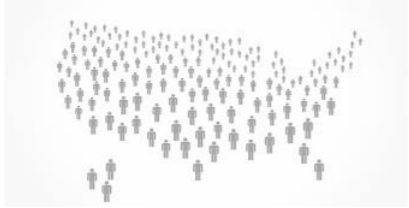




# Consumer Survey Data (Shows Rebates to Individuals Only, CVRP “Current Program” Only)

					<b>Total</b>
<b>Vehicle Purchase/ Lease Dates</b>	<u>Nov. 2016*</u> – Dec. 2018	Jun. 2014 – Oct. 2018	May 2015 – Sep. 2018	Mar. 2017 – Jul. 2018	Jun. 2014 – Dec. 2018
<b>Survey Responses (total n)**</b>	23,478	4,555	1,565	1,808	31,406
<b>Program Population (N)</b>	135,897	10,920	3,510	8,651	158,978

\* After the most recent change in the program’s income criteria, to reflect the “current program era”

\*\* Weighted to represent the program population along the dimensions of vehicle category, vehicle model, buy vs. lease, and county (using raking method)

# Rebated EV Consumer Characteristics (CVRP “current program” only)

	 <b>All</b> U.S. Population (Census 2017)	<b>New-Vehicle Buyers</b> U.S. MYs 2016–17 (2017 NHTS)	 Nov. 2016 – Dec. 2018 weighted n = 23,478	 Massachusetts Offers Rebates for Electric Vehicles Jun. 2014 – Oct. 2018 weighted n = 4,555	 Connecticut Hydrogen and Electric Automobile Purchase Rebate May 2015 – Sep. 2018 weighted n = 1,565	 Mar. 2017 – Jul. 2018 weighted n = 1,808
Selected solely White/Caucasian	61%	74%	54%	85%	87%	86%
≥ 50 Years Old	34%	51%	52%	58%	54%	59%
≥ Bachelor’s Degree in HH	23%*	56%*	83%	90%	83%	76%
Own Residence	63%	75%	82%	92%	89%	90%
≥ \$150k HH Income	12%	23%	42%	58%	43%	39%
Selected Male	49%	51%	73%**	78%	74%	70%

*“Prefer not to answer,” “I don’t know,” and similar responses are excluded throughout.*





*Census 2017: 2013–2017 American Community Survey, <http://factfinder2.census.gov>.*

*NHTS weighted to represent population, not new-vehicle subset. New-vehicle buyers identified based on within-100-mile match between odometer and miles driven while owned.*

*\* Census & NHTS data characterize individual educational attainment, whereas other data characterize highest household attainment.*

*\*\* 100% includes non-binary options.*

# Rebated EV Consumer Characteristics (CVRP “current program” only)

	“Buying Age” 21+ Years Old U.S. Population (Census 2017)	New-Vehicle Buyers U.S. MYs 2016–17 (2017 NHTS)	 CALIFORNIA CLEAN VEHICLE REBATE PROJECT™ Nov. 2016 – Dec. 2018 weighted n = 23,478	 MOR-EV Massachusetts Offers Rebates for Electric Vehicles Jun. 2014 – Oct. 2018 weighted n = 4,555	 CHEAPR Connecticut Hydrogen and Electric Automobile Purchase Rebate May 2015 – Sep. 2018 weighted n = 1,565	 NEW YORK STATE Mar. 2017 – Jul. 2018 weighted n = 1,808
Selected solely White/Caucasian	65%	74%	54%	85%	87%	86%
≥ 50 Years Old	47%	51%	52%	58%	54%	59%
≥ Bachelor’s Degree in HH	30%*	56%*	83%	90%	83%	76%
Own Residence	64%	75%	82%	92%	89%	90%
≥ \$150k HH Income	12%	23%	42%	58%	43%	39%
Selected Male	49%	51%	73%**	78%	74%	70%

“Prefer not to answer,” “I don’t know,” and similar responses are excluded throughout.

Census 2017: 2013–2017 American Community Survey, <http://factfinder2.census.gov>.

NHTS weighted to represent population, not new-vehicle subset. New-vehicle buyers identified based on within-100-mile match between odometer and miles driven while owned.

\* Census & NHTS data characterize individual educational attainment, whereas other data characterize highest household attainment.

\*\* 100% includes non-binary options.

# CSE Areas of Expertise



## Clean Transportation

Adoption of electric vehicles  
and deployment of charging  
infrastructure



## Built Environment

Advancing energy efficiency  
and renewable resources



## Technology Convergence

Interconnecting systems to  
achieve decarbonization

# CSE: A Nonprofit With Billion-Dollar Program Management Experience

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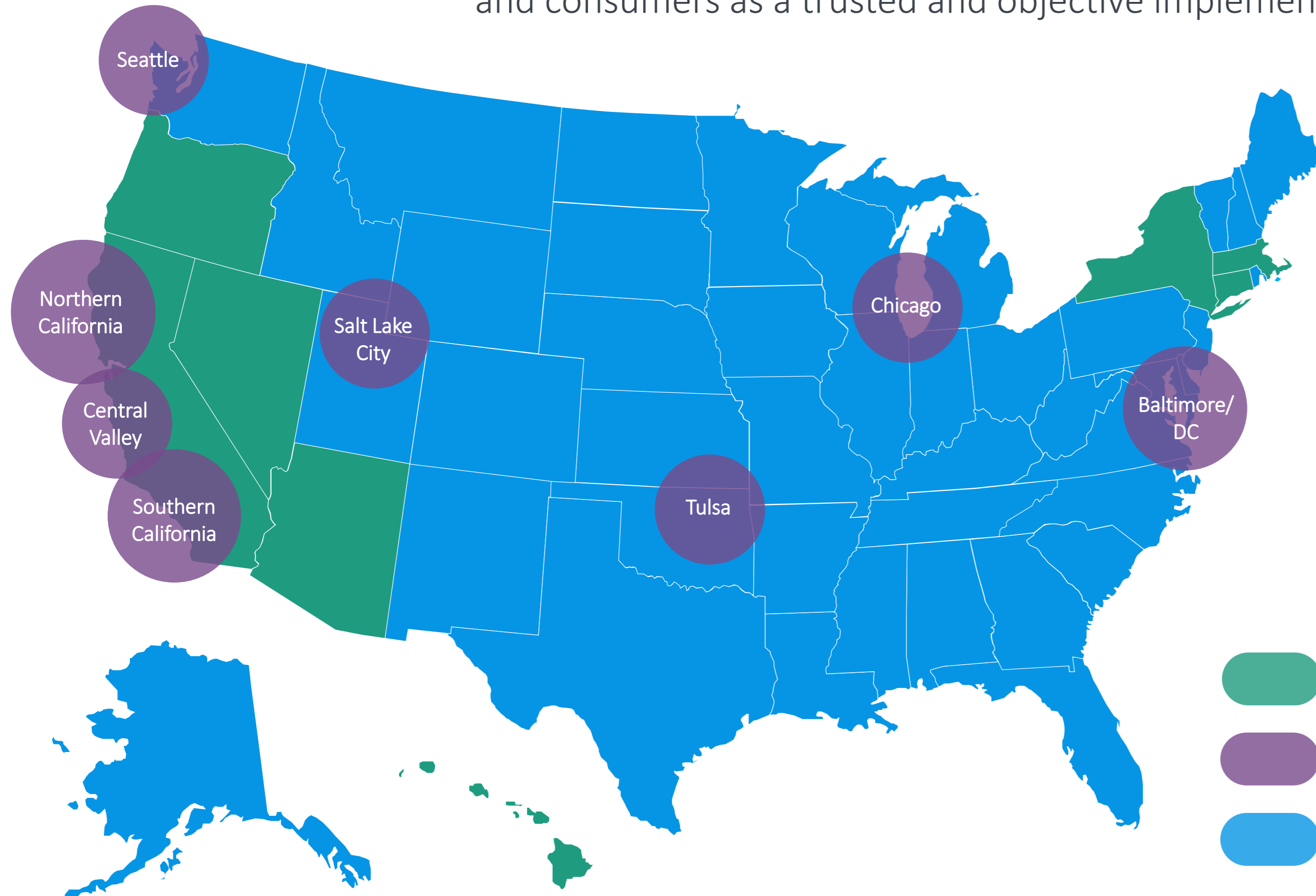
- **Five Statewide Electric Vehicle Rebate Programs**
  - > \$720 million
  - > 350,000 rebated vehicles
  - > 300,000 consumers characterized
- **Statewide EV Charging Incentives**
  - > \$100 million
  - 367 DC fast chargers, 211 Level 2 chargers and growing
  - Diverse: urban, rural, mountains, deserts, plains
- **Solar On Multifamily Affordable Housing Program**
  - \$1 billion
  - 300 MW + virtual net energy metering





# How Can We Help?

We work with governments, regulators, utilities, CCAs, businesses, property owners, and consumers as a trusted and objective implementation partner and technical advisor.






## For more information:

<https://cleanvehiclerebate.org/eng/program-reports>

<https://energycenter.org/thought-leadership/research-and-reports>

[brett.williams@energycenter.org](mailto:brett.williams@energycenter.org)

-  Statewide incentive programs
-  Region-specific solutions
-  Tackling issues of national importance

# Contact Us

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# Topics for Discussion

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- Tales in EV Sales, in Maryland and elsewhere (slide 4)
- Who is buying EVs and receiving rebates? (slides 13 – 20)
  - EV consumer demographics / incentive beneficiaries (a.k.a. “Are they just rich white guys?”)
- What are the paths forward? (slides 21 – 29)
  - EV incentive design and outreach strategy for: Volume benefits vs. Cost effectiveness vs. Equity
- Outcomes: what behaviors are rebates influencing? (slides 30 – 32)
  - A.k.a. “Are EVs just toys that don’t get used and don’t do any good?”
- Impacts: for the market and emissions (slides 34 – 38)
  - A.k.a. “Do they do any good?”
- What about the federal tax credit? (slides 39 – 43)
- Implementation perspectives and program design considerations (slides 44 – 56)
  - Income caps vs. MSRP caps
  - Pillars of program administration (slide 62)
- Dealer sales incentives (slides 57 – 59)
- Comprehensive and effective EV policy frameworks (64)
  - Vehicle supply, awareness, purchase/lease incentives, dealer sales incentive, fuel carbon intensity, vehicle use
- Musings for Maryland: program-design recommendations (slides 60 – 63)