

Brett Williams, PhD – Principal Advisor, EV Programs, CSE

Nicholas Pallonetti – Research Analyst, CSE

*with thanks to J. Bowers and others at the Center for Sustainable Energy (CSE)*



# Outline: Incentive Influence (during the onset of COVID-19)



- I. Program Design (data context)
- II. Incentive Influence
  - A. State Rebates
  - B. Federal Tax Credit
- III. Summary & Select Findings

## Additional Details & Resources

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 charging port of a white electric car. 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 public charging station with several orange charging cables is visible, along with a blurred city street scene.

# Context

## Program Design



# Base Rebate Amount for Most Individuals Decreased \$500



	as of Mar. 2010	as of Jun. 2011	as of Jul. 2013	as of Jun. 2014	as of Mar. 2016	as of Nov. 2016	as of Dec. 2019
Fuel-Cell EVs 	\$3,000– \$5,000 ‡	\$1,500– \$2,500 ‡	\$2,500	\$5,000	\$5,000 *	\$5,000**	\$4,500***
Battery EVs † 	\$3,000– \$5,000 ‡	\$1,500– \$2,500 ‡	\$2,500	\$2,500	\$2,500 *	\$2,500**	\$2,000***
Plug-in Hybrid EVs 	\$3,000	\$1,500	\$1,500	\$1,500	\$1,500 *	\$1,500**	\$1,000***
Zero-Emission Motorcycles 	\$1,500	\$900	\$900	\$900	\$900	\$900	\$750
Neighborhood EVs	\$1,500	\$900	\$900	\$900	\$900	None eligible	None eligible
Commercial Zero-Emission Vehicles	\$20,000						

† Includes range-extended battery electric vehicles.  
‡ Amounts varied by ZEV type. For definitions, see CCR 1962.1.  
\* Lower-income consumers eligible for an additional \$1,500.  
\*\* Lower-income consumers eligible for an additional \$2,000.  
\*\*\* Lower-income consumers eligible for an additional \$2,500.

# Program Design Shapes Outcomes

  = in effect during 2020



<p><b>as of Mar. 2010</b></p> <ul style="list-style-type: none"> <li>• Incentive stacking permitted</li> <li>• 36-month ownership requirement</li> <li>• Rebates per year limit = 20</li> </ul>	<p><b>as of Dec. 2013</b></p> <ul style="list-style-type: none"> <li>• Rebates per year limit = 2</li> </ul> <p><b>as of May 2014</b></p> <ul style="list-style-type: none"> <li>• 18-month application window</li> </ul>	<p><b>as of Dec. 2014 / Jan. 2015</b></p> <ul style="list-style-type: none"> <li>• 30-month ownership requirement (retroactive)</li> <li>• Total rebate limit = 2</li> </ul>	<p><b>as of Mar. 2016</b></p> <ul style="list-style-type: none"> <li>• \$250k–\$500k income cap (PEVs)</li> <li>• +\$1,500 for income-qualified households (<math>\leq</math> 300% FPL), excluding ZEMs</li> </ul>	<p><b>as of Nov. 2016</b></p> <ul style="list-style-type: none"> <li>• \$150k–\$300k income cap (PEVs)</li> <li>• +\$2,000 for income-qualified households (<math>\leq</math> 300% FPL), excl. ZEMs</li> <li>• <math>\geq</math> 20 UDDS electric miles</li> </ul>
<p><b>as of Jan. 2018</b></p> <ul style="list-style-type: none"> <li>• \$150k–\$300k income cap on stacking HOV decal (only binding on FCEVs)</li> <li>• Rebate Now San Diego County preapproval pilot with point-of-sale option</li> </ul>	<p><b>as of Jan. 2019</b></p> <ul style="list-style-type: none"> <li>• Stacking with CVAP grant not permitted (retroactive)</li> </ul>	<p><b>as of Dec. 2019</b></p> <ul style="list-style-type: none"> <li>• Base MSRP <math>\leq</math> \$60k (PEVs)</li> <li>• <math>\geq</math> 35 UDDS electric miles</li> <li>• +\$2,500<sup>†</sup> for income-qualified households (<math>\leq</math> 300% FPL), excl. ZEMs</li> <li>• Total rebates limit = 1<sup>§</sup></li> <li>• 3-month application window<sup>‡</sup></li> </ul>	<p><b>as of Apr. 2020</b></p> <ul style="list-style-type: none"> <li>• Stacking with CVAP grant permitted</li> </ul> <p><b>as of Jan. 2021</b></p> <ul style="list-style-type: none"> <li>• +\$2,500 for income-qualified households (<math>\leq</math> 400% FPL), excl. ZEMs</li> </ul>	<p><b>as of Apr. 2021</b></p> <ul style="list-style-type: none"> <li>• <math>\geq</math> 30 U.S. EPA electric miles (45 UDDS)</li> <li>• Rebate Now preapproval option limited to income-qualified households, expanded to include SJ Valley</li> </ul>

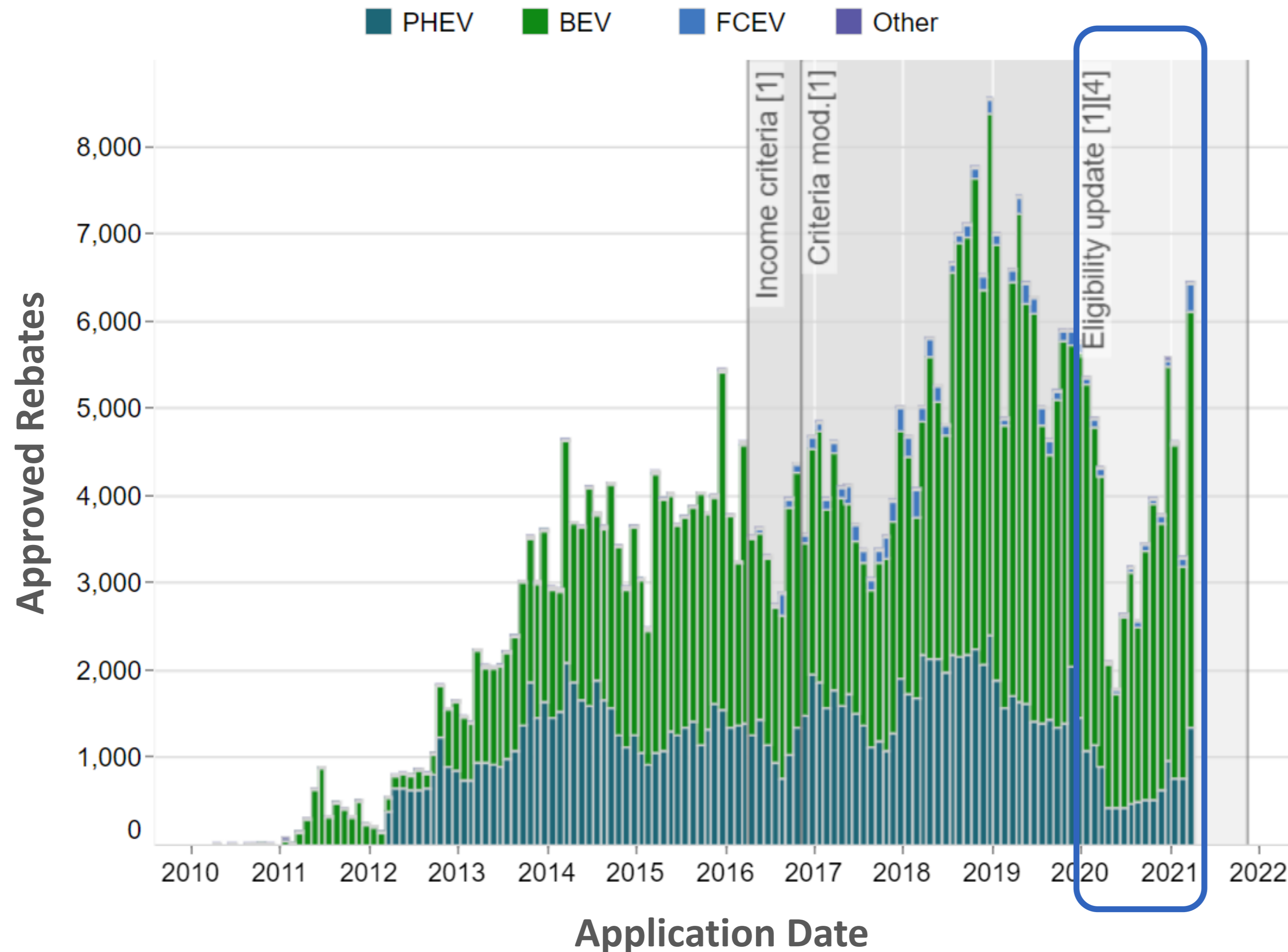
PEVs = plug-in EVs. FPL = Federal Poverty Level. ZEMs = zero-emission motorcycles. UDDS = Urban Dynamometer Driving Schedule. HOV = high-occupancy-vehicle. FCEVs = fuel-cell EVs. CVAP = Clean Vehicle Assistance Program. MSRP = manufacturer suggested retail price.

<sup>†</sup> Change due to \$500 decrease in standard rebate amounts (previous slide). <sup>§</sup> A second rebate can be approved for a FCEV if the first rebate was for a PEV.

<sup>‡</sup> COVID exemptions on application window effectively delayed implementation until 4/15/2021.

# 2020 Results/Trends Should be Interpreted with Caution (COVID)

## Applications Saw Dramatic Decline But Significant Recovery



With COVID exemptions, rebate applications for calendar year 2020 purchases/leases for individuals spanned 1/1/2020 – 4/15/2021.

12% applied in 2021.



# CVRP Consumer Survey Editions

(shows rebates to individuals for plug-in EVs\* only)

	<b>2013–2015 Edition</b>	<b>2015–2016 Edition</b>	<b>2016–2017 Edition</b>	<b>2017–2020 Edition</b>	<b>Total</b>
<b>Vehicle Purchase/ Lease Dates</b>	Sep. 2012 – May 2015	April 2015 – May 2016	May 2016 – May 2017	June 2017 – Nov. 2020	Sep. 2012 – Nov. 2020
<b>Survey Responses (total <i>n</i>)**</b>	19,460	11,611	8,957	32,524	72,552
<b>Program Population (<i>N</i>)***</b>	91,100	45,700	46,800	193,200	376,800

\*Plug-in EVs (PEVs) include PHEVs and BEVs.

\*\* Subsequently weighted to represent the program population along the dimensions of vehicle category, vehicle model, buy vs. lease, and county. Weighting dimensions for the 2017–20 Edition also included year of purchase/lease.

\*\*\* Small numbers of rebated vehicles are not represented in the time frames due to application lags. Rounded to nearest 100.

# CVRP Consumer Survey Data Used

(shows rebates to individuals for plug-in EVs only)

	<b>2013–2015 Edition</b>	<b>2015–2016 Edition</b>	<b>2016–2017 Edition</b>	<b>2017–2020 Edition</b>	<b>2018 purchases/ leases subset</b>	<b>2019 purchases/ leases subset</b>	<b>“2020” purchases/ leases subset</b>
<b>Vehicle Purchase/ Lease Dates</b>	Sep. 2012 – May 2015	April 2015 – May 2016	May 2016 – May 2017	June 2017 – Nov.* 2020	Jan. 2018 – Dec. 2018	Jan. 2019 – Dec. 2019	Jan. 2020 – <b>Nov.* 2020</b>
<b>Survey Responses (total <i>n</i>)</b>	19,460**	11,611**	8,957**	32,524**	14,757	8,991	4,331**
<b>Program Population (<i>N</i>)***</b>	91,100	45,700	46,800	193,200	78,600 (filtered subset of weighted Edition)	61,300 (filtered subset of weighted Edition)	26,500

*\* ~8k 2020 purchases/leases were invited to respond to a new survey edition and are not represented in these data.*

\*\* Subsequently weighted to represent the program population along the dimensions of vehicle category, vehicle model, buy vs. lease, and county. Weighting for the 2017–20 Edition also included year of purchase/lease. The 2020 subset was also independently weighted, producing only minor differences compared to the filtering approach.

\*\*\* Small numbers of rebated vehicles are not represented in the time frames due to application lags. Rounded to nearest 100.



A close-up photograph of a person's hand plugging a charging cable into the charging port of a white 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 several orange charging cables is visible, along with a building and a bicycle parked nearby.

# Incentive Influence



# Incentive Influence: Select Publications with Related Content

(reverse chronological, as of 2/2022)

- N. Pallonetti and B.D.H. Williams (2022, Jan.), [“Evaluating the Cost-Effectiveness of Greenhouse Gas Emission Reductions Associated with Statewide Electric Vehicle Rebate Programs in California and Massachusetts in 2019,”](#) for *International Energy Program Evaluation Conference 2022*.
- Williams, B. D. H. (2022, Jan.), [Brief: PHEV Consumers Most Highly Influenced by the U.S. Federal Tax Credit](#). Clean Vehicle Rebate Project.
- B. D. H. Williams and J. B. Anderson (2021, Mar.), [“Strategically Targeting Plug-In Electric Vehicle Rebates and Outreach Using ‘EV Convert’ Characteristics,”](#) *Energies*, vol. 14, no. 7, p. 1899.
- B.D.H. Williams, J.B. Anderson, A. Lastuka (2020, Sep.), [Characterizing Plug-in Hybrid Electric Vehicle Consumers Who Found the U.S. Federal Tax Credit Extremely Important in Enabling Their Purchase](#), in: *33rd Electr. Veh. Symp.*, Electric Drive Transportation Association (EDTA), EVS33, and Zenodo, Portland OR.
- B.D. Williams, J. Orose, M. Jones, J.B. Anderson (2018, Oct.), [Summary of Disadvantaged Community Responses to the Electric Vehicle Consumer Survey, 2013–2015 Edition](#). Clean Vehicle Rebate Project.
- B.D. Williams, J.B. Anderson (2018, Sep.), [Strategically Targeting Plug-in Electric Vehicle Rebates and Outreach Using Characteristics of “Rebate-Essential” Consumers in 2016–2017](#), in: *31st Int. Electr. Veh. Symp.*, Society of Automotive Engineers of Japan, Inc., Kobe, Japan.
- C. Johnson, B.D. Williams, J.B. Anderson, N. Appenzeller (2017, Jun.), [Evaluating the Connecticut Dealer Incentive for Electric Vehicle Sales](#), Center for Sustainable Energy (CSE).
- C. Johnson, B.D. Williams (2017, Jan.), [Characterizing Plug-In Hybrid Electric Vehicle Consumers Most Influenced by California’s Electric Vehicle Rebate](#), *Transp. Res. Rec.* 2628, 23–31.

# Incentive Influence: Select Presentations with Related Content

(reverse chronological, as of 2/2022)

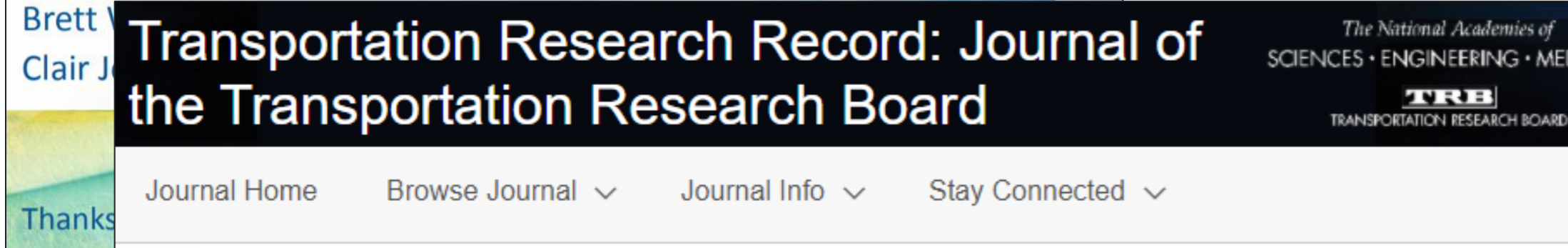
- [Cost-Effectiveness of Greenhouse Gas Emission Reductions Associated with California’s Clean Vehicle Rebate Project in 2019 \(and 2020\)](#)
- [California Plug-in Hybrid EV Consumers Who Found the U.S. Federal Tax Credit Extremely Important in Enabling Their Purchase](#)
- [Data from Statewide Electric Vehicle Rebate Programs: Vehicles, Consumers, Impacts, and Effectiveness](#)
- [CVRP CY 2019 Data Brief: Vehicle Replacement & Incentive Influence](#)
- [CVRP Data Brief: MSRP Considerations](#)
- [EV Purchase Incentives: Program Design, Outputs, and Outcomes of Four Statewide Programs with a Focus on Massachusetts](#)
- [What Vehicles Are Electric Vehicles Replacing and Why?](#)
- [Electric Vehicle Incentives and Policies](#)
- [Proposed FY 2019–20 Funding Plan: Final CVRP Supporting Analysis](#)
- [CVRP: Data and Analysis Update](#)
- [Cost-Effectively Targeting EV Outreach and Incentives to “Rebate-Essential” Consumers](#)
- [Electric Vehicle Rebates: Exploring Indicators of Impact in Four States](#)
- [Targeting EV Consumer Segments & Incentivizing Dealers](#)
- [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 Findings](#)
- [CVRP Income Cap Analysis: Informing Policy Discussions](#)
- [Characterizing California Electric Vehicle Consumer Segments](#)



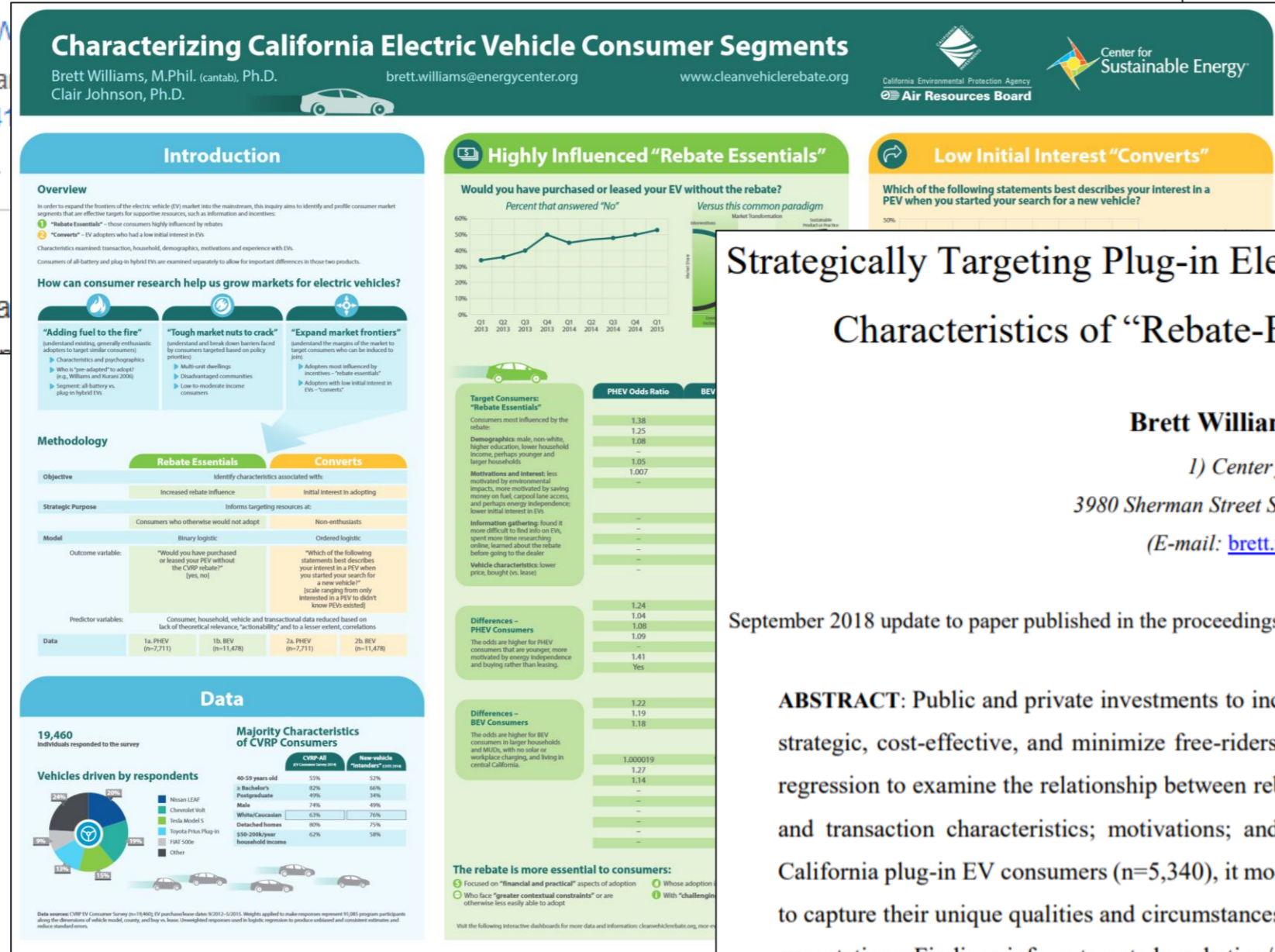
# Previous Work on *Rebate Essentials*: Summary



BECC Conference presentation ([Williams & Johnson 2016](#))



TRR journal article ([Johnson and Williams 2017](#))



National Academies TRB poster ([Williams and Johnson 2017](#))

Strategically Targeting Plug-in Electric Vehicle Rebates and Outreach Using Characteristics of "Rebate-Essential" Consumers in 2016–2017

Brett Williams<sup>1)</sup> John Anderson<sup>1)</sup>  
1) Center for Sustainable Energy  
3980 Sherman Street Suite 170, San Diego, CA 92161  
(E-mail: [brett.williams@energycenter.org](mailto:brett.williams@energycenter.org))

EVS 31 paper ([Williams & Anderson 2018](#))

September 2018 update to paper published in the proceedings of the 31<sup>st</sup> International Electric Vehicle Symposium (EVS 31) in 2018.

**ABSTRACT:** Public and private investments to increase electric-vehicle adoption are strategic, cost-effective, and minimize free-ridership. Building on previous work, we use regression to examine the relationship between rebate influence and transaction characteristics; motivations; and experience). We analyze data from California plug-in EV consumers (n=5,340), it models adopters of EVs to capture their unique qualities and circumstances. Changes related to EV adoption expectations. Findings inform targeted marketing/education/outreach and supportive policies.

**KEY WORDS:** electric vehicle (EV) consumer characteristics, target market



Report for NYSERDA  
([Williams & Anderson 2021](#))





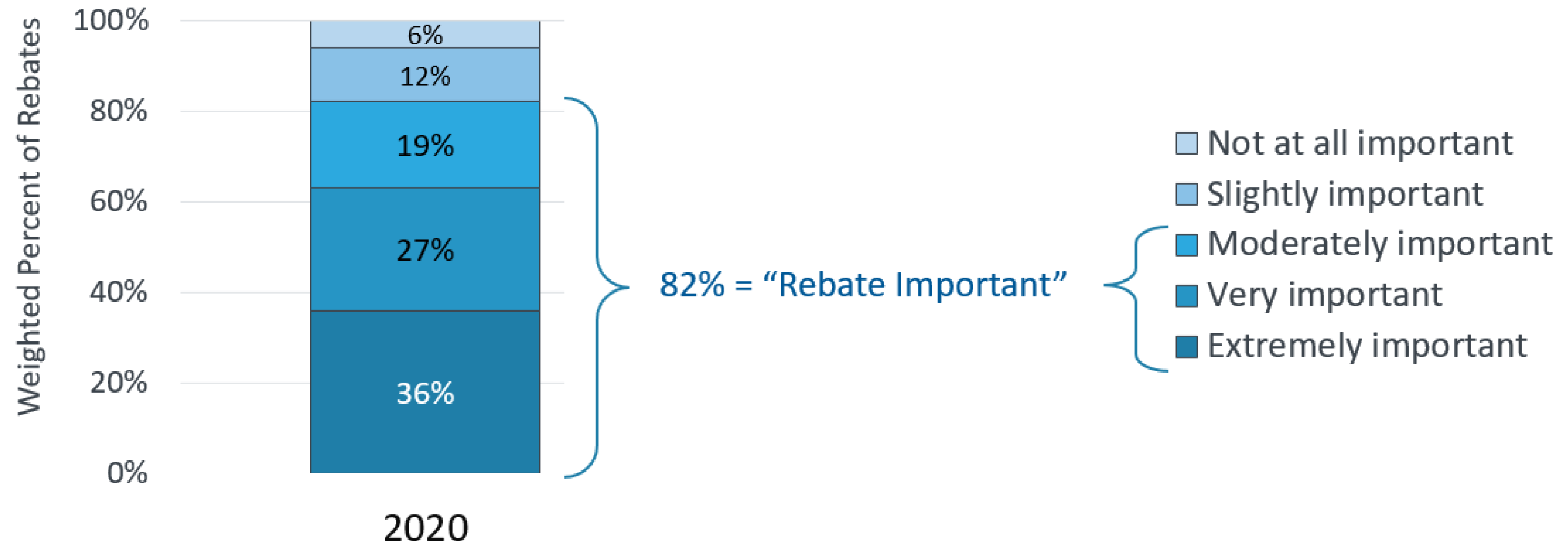
# Rebate Influence

(during the onset of COVID-19)



# Rebate Importance During the Onset of COVID-19

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

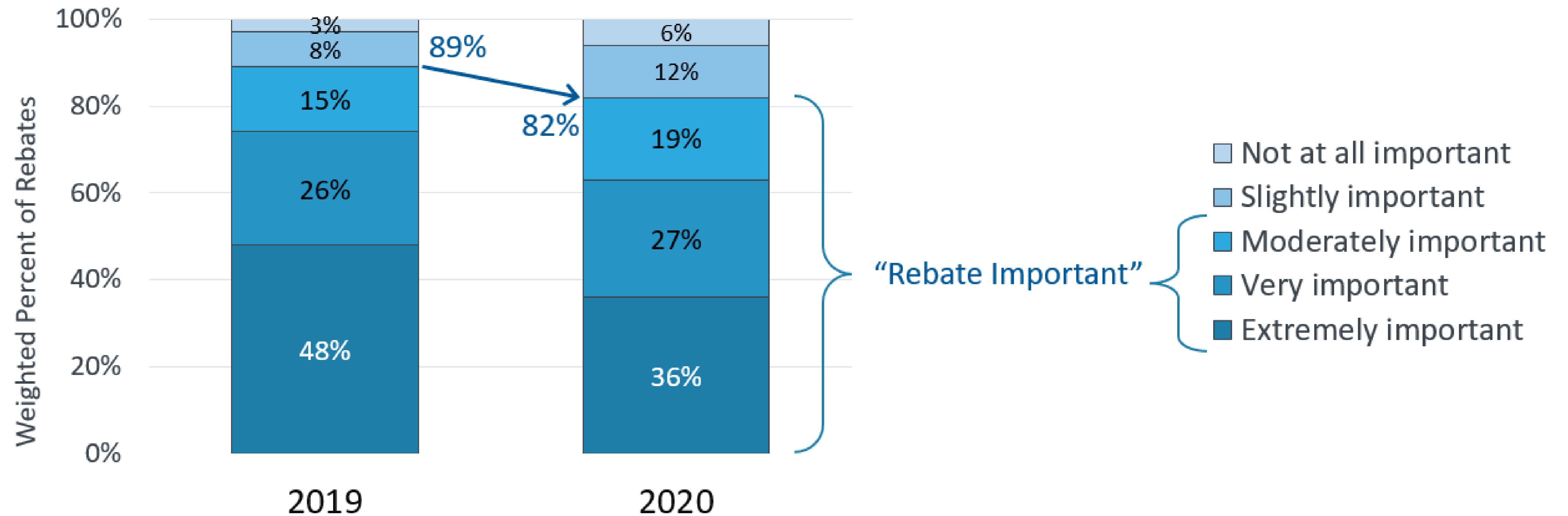


Plug-in EV purchases/leases. CVRP Consumer Survey, 2017–2020 Edition. Filtered, question-specific  $n = 4,269$ .



# Rebate Importance: 2019 vs. 2020

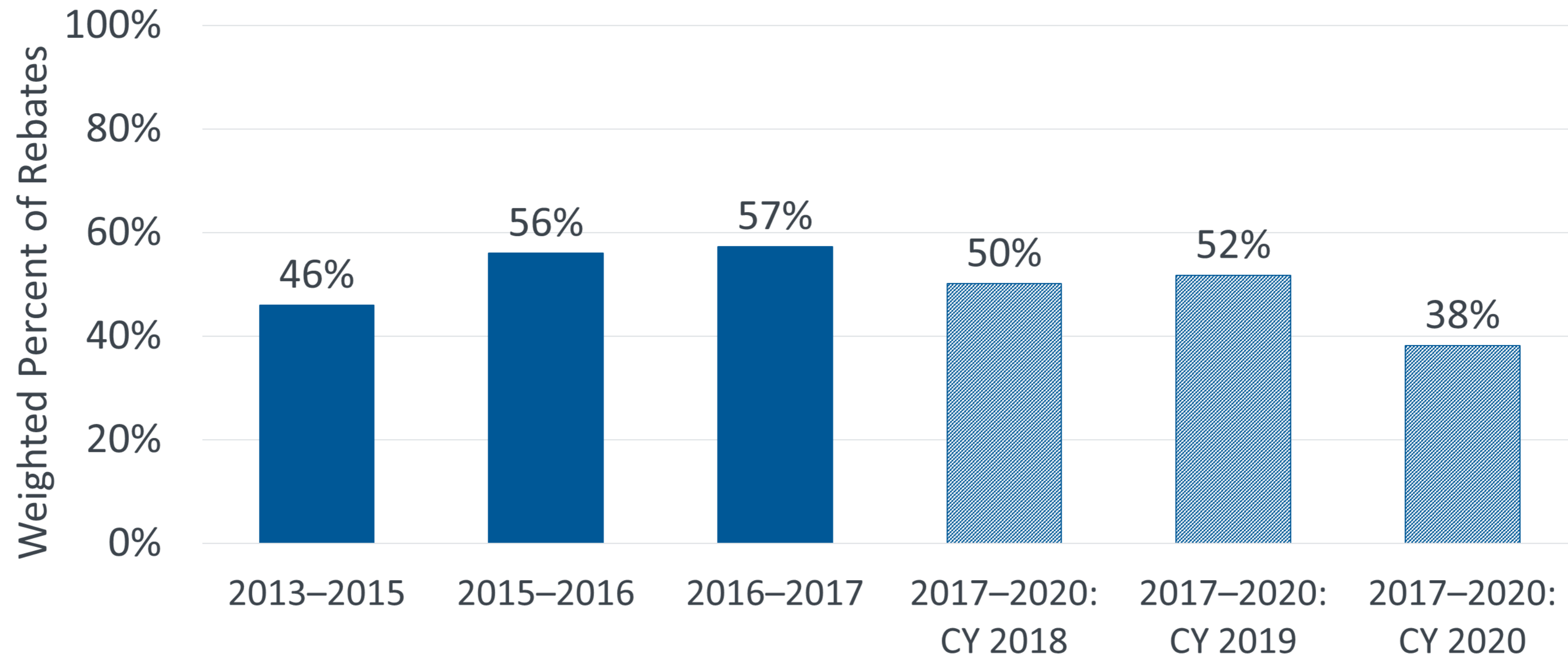
How **important** was the state rebate in **making it possible** for you to acquire your clean vehicle?



Plug-in EV purchases/leases. CVRP Consumer Survey, 2017–2020 Edition. 2019  $n = 8,875$ . 2020  $n = 4,269$ .  
 $n$ -values are filtered and question-specific. 2020 weights specific to 2020 purchases/leases.

# Rebate Essentiality Over Time: COVID Effect?

Would **not** have purchased/leased their plug-in EV **without the state rebate**



CVRP Consumer Survey Edition or Purchase/Lease Year

CVRP Consumer Survey, 2013-2015 Edition: filtered, question-specific  $n = 19,205$

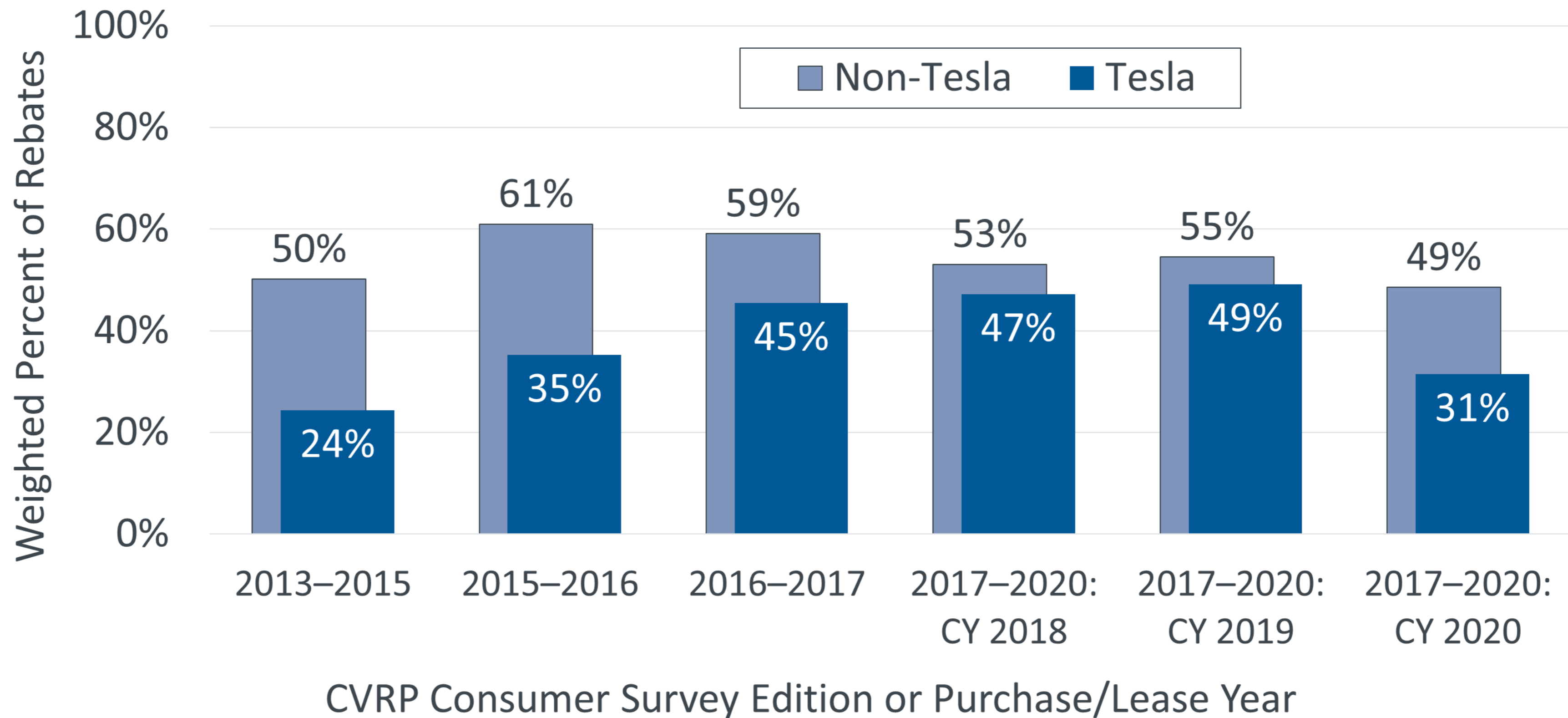
2015-2016 Edition: filtered, question-specific  $n = 11,462$

2016-2017 Edition: filtered, question-specific  $n = 8,857$

2017-2020 Edition:  $n$ -values are filtered and question-specific. CY 2018  $n = 14,655$ . CY 2019  $n = 8,929$ . CY 2020  $n = 4,304$ . CY 2020 weights specific to 2020 purchases/leases.

# Rebate Essentiality Over Time: Tesla's Effect

Would not have purchased/leased their plug-in EV without the state rebate



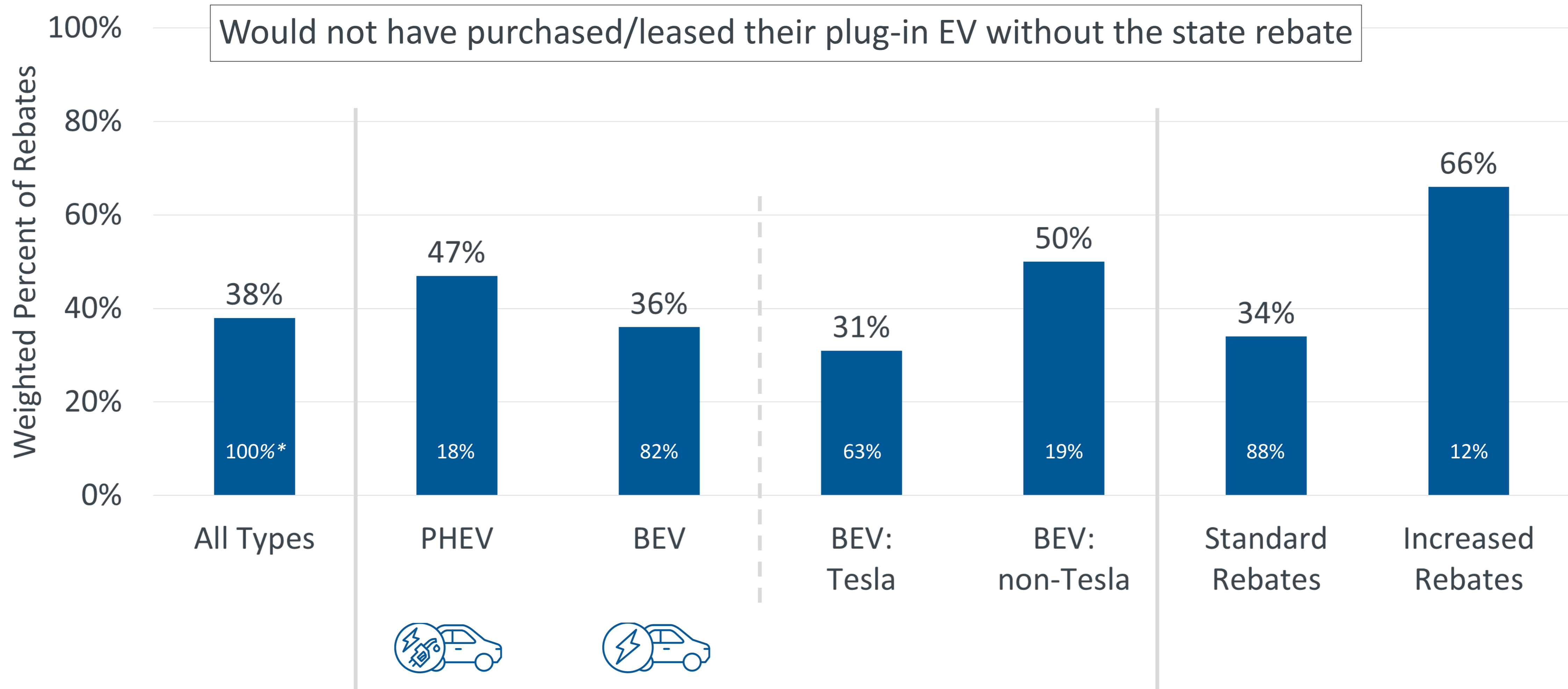
CVRP Consumer Survey, 2013–2015 Edition: filtered, question-specific  $n = 19,205$   
 2015–2016 Edition: filtered, question-specific  $n = 11,462$   
 2016–2017 Edition: filtered, question-specific  $n = 8,857$

2017–2020 Edition:  $n$ -values are filtered and question-specific. CY 2018  $n = 14,655$ . CY 2019  $n = 8,929$ . CY 2020  $n = 4,304$ . CY 2020 weights specific to 2020 purchases/leases.



# Rebate Essentiality by Vehicle and Rebate Type

2020 purchases/leases

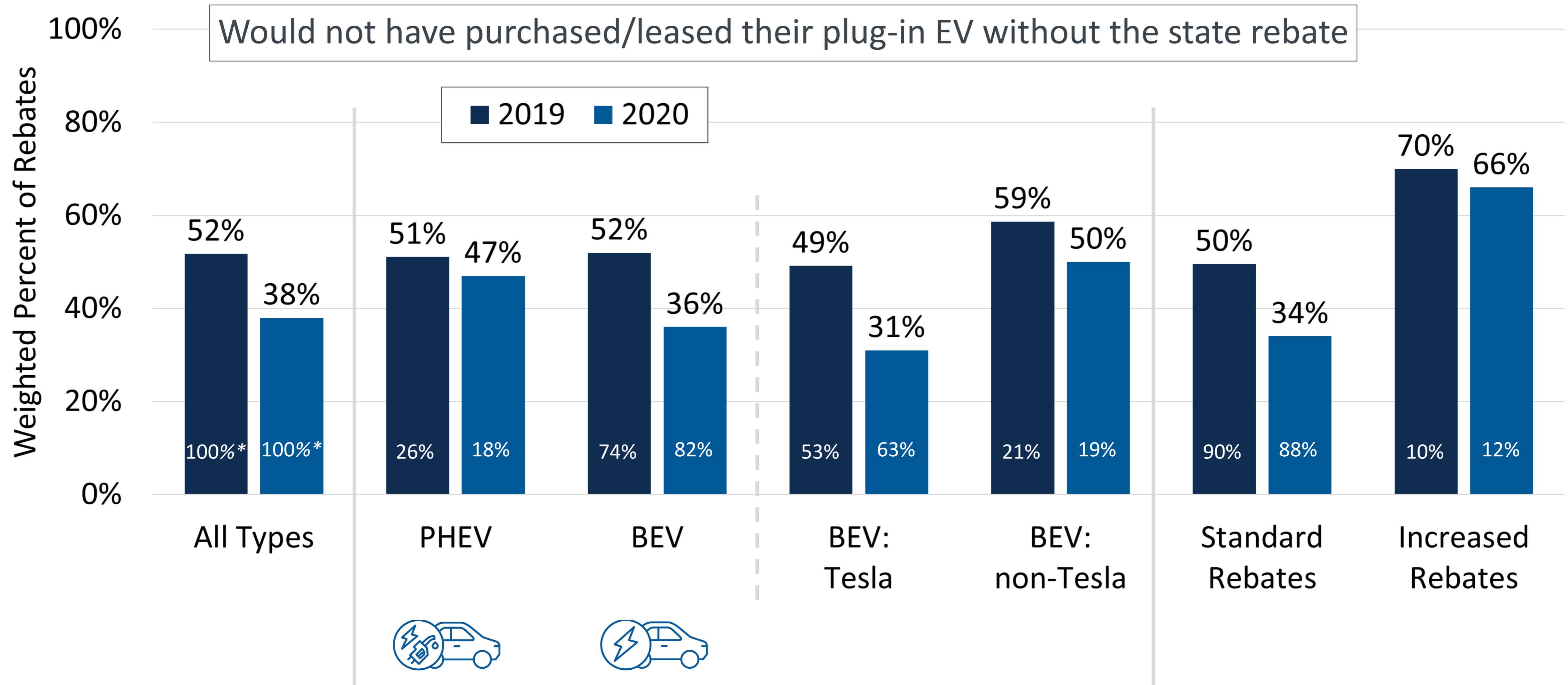


\* Percentages in white inside columns are the percent of total rebates given to individual consumers.

Rebate Essentiality percentages are calculated using the CVRP Consumer Survey, 2017–2020 Edition. Filtered, question-specific  $n = 4,304$ .

# Rebate Essentiality by Vehicle and Rebate Type

2019 & 2020 purchases/leases



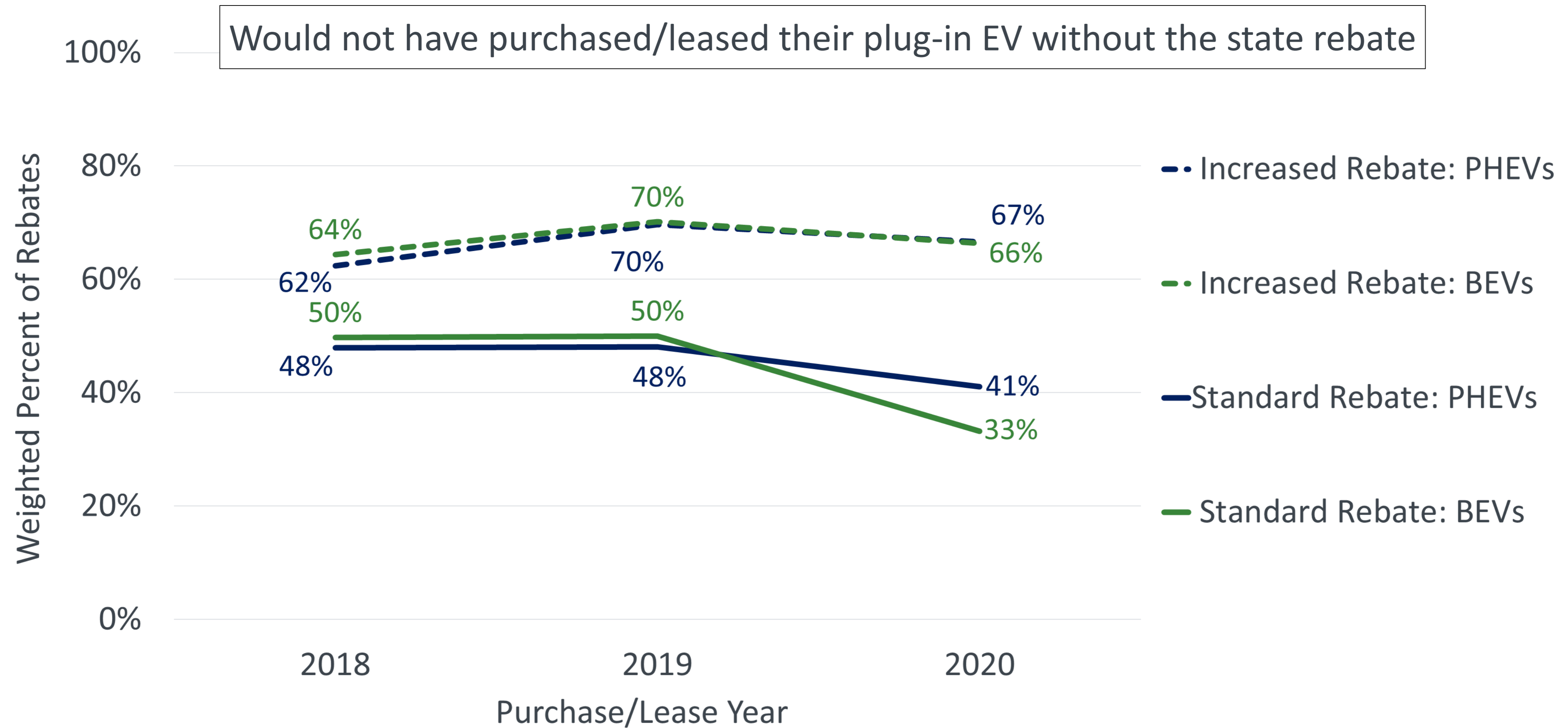
\* Percentages in white inside columns are the percent of total rebates given to individual consumers.

Rebate Essentiality percentages are calculated using the CVRP Consumer Survey, 2017–2020 Edition. 2019 *n* = 8,929. 2020 *n* = 4,304.

*n*-values are filtered and question-specific. 2020 weights specific to 2020 purchases/leases.

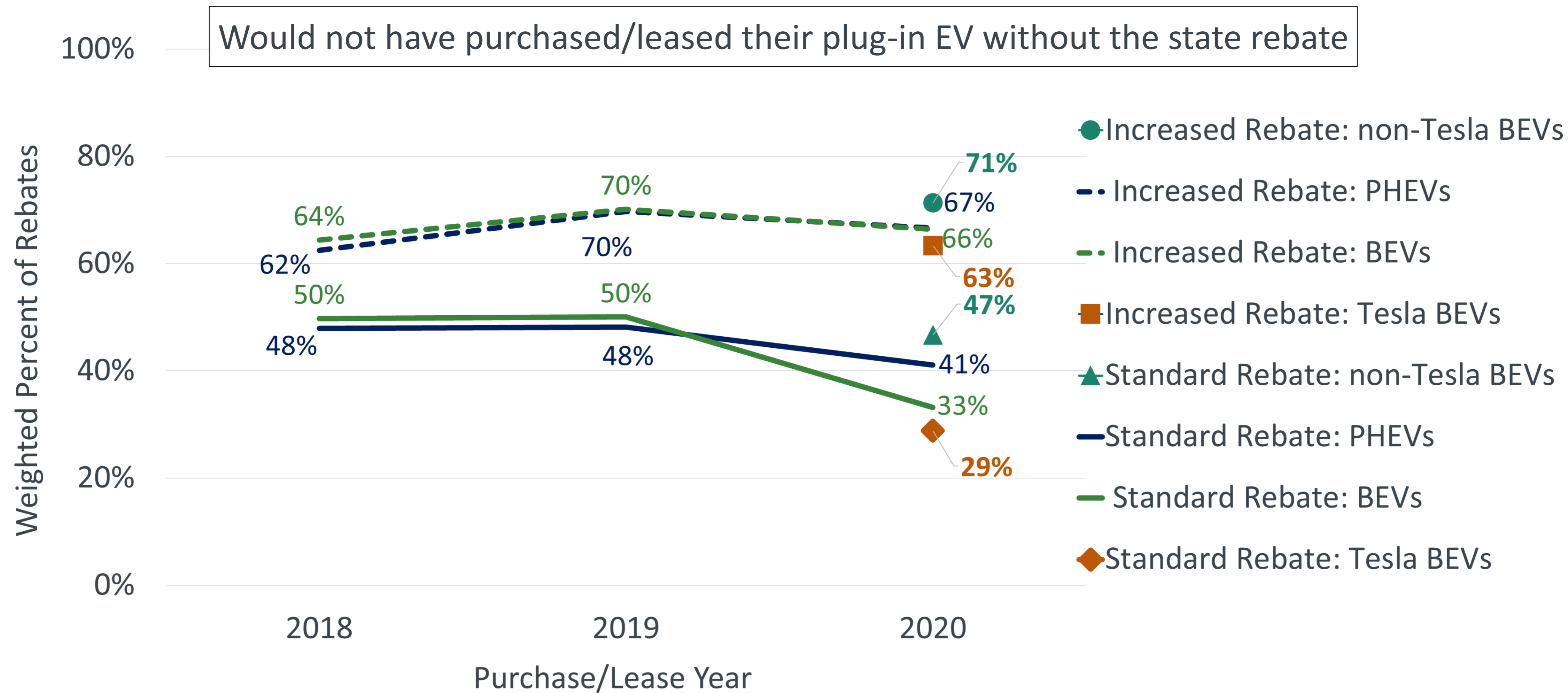


# Rebate Essentiality by Vehicle and Rebate Type Over Time



CVRP Consumer Survey, 2017–2020 Edition. 2018 *n* = 14,655. 2019 *n* = 8,929. 2020 *n* = 4,304. *n*-values are filtered and question-specific. 2020 weights specific to 2020 purchases/leases.

# Rebate Essentiality by Vehicle and Rebate Type Over Time: Tesla's Effect



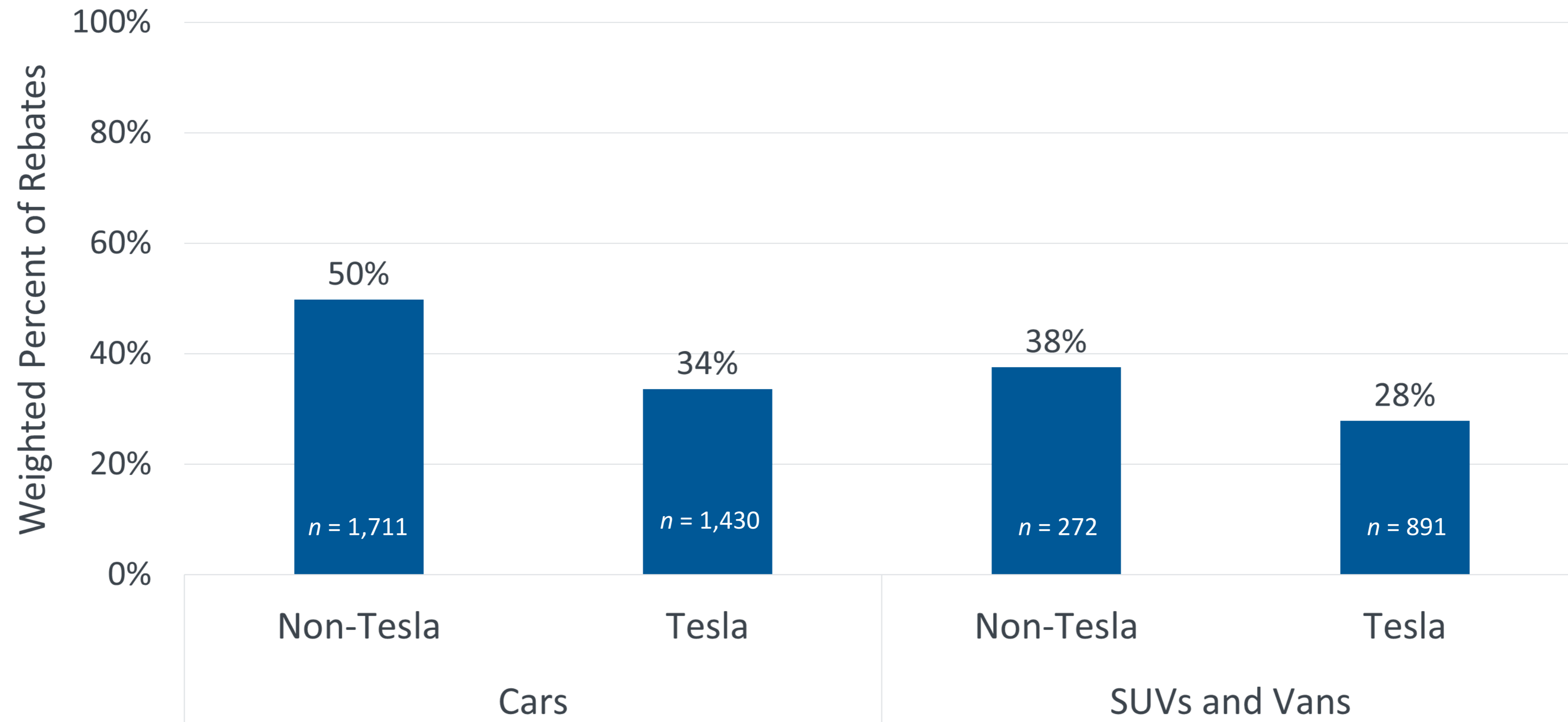
CVRP Consumer Survey, 2017–2020 Edition. 2018  $n = 14,655$ . 2019  $n = 8,929$ . 2020  $n = 4,304$ .  
 $n$ -values are filtered and question-specific. 2020 weights specific to 2020 purchases/leases.



# Rebate Essentiality by Vehicle Class

2020 purchases/leases

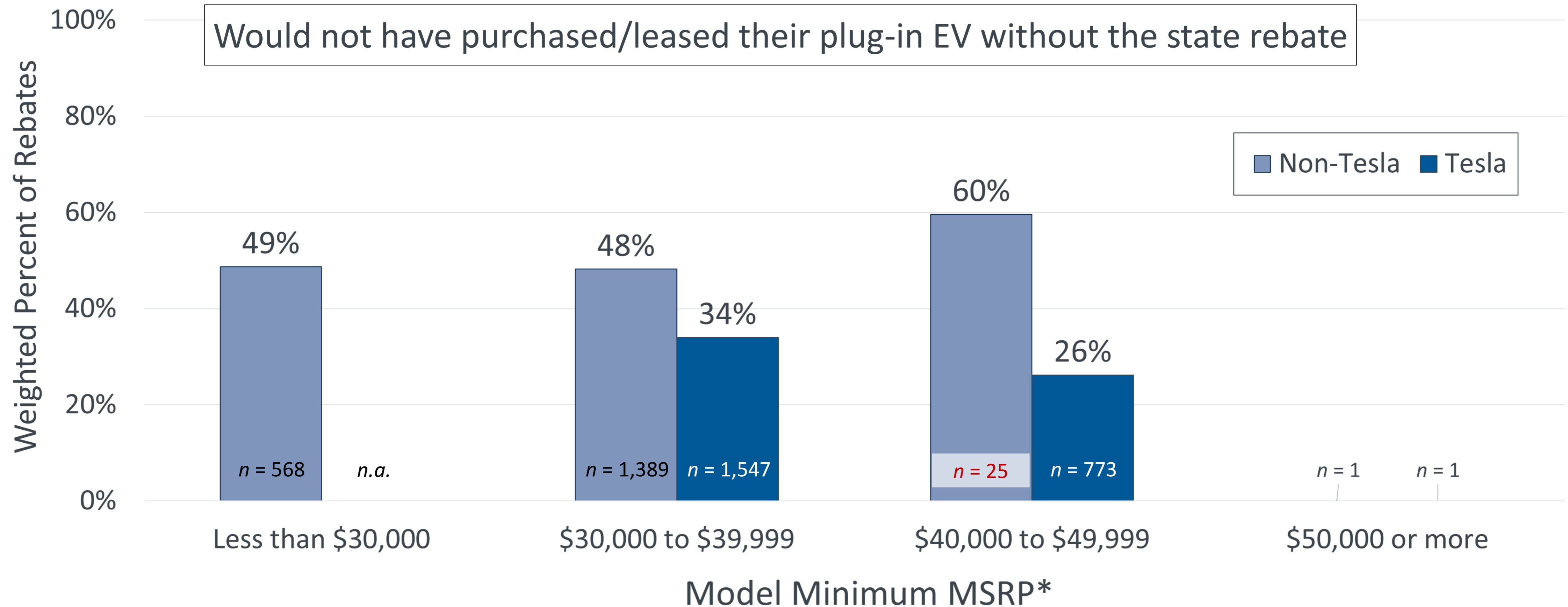
Would not have purchased/leased their plug-in EV without the state rebate



CVRP Consumer Survey, 2017–2020 Edition. Filtered, question-specific  $n = 4,304$ .

# Rebate Essentiality by MSRP Decreases for Tesla

2020 purchases/leases



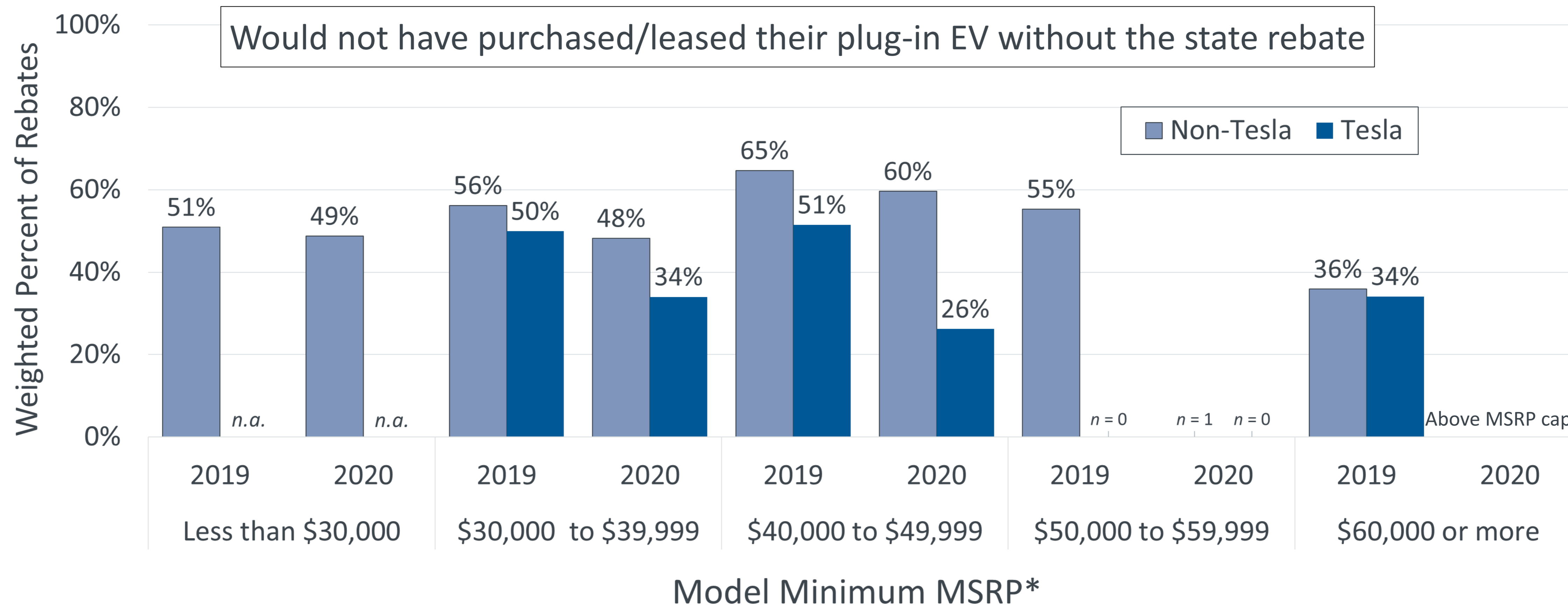
CVRP Consumer Survey, 2017–2020 Edition. Filtered, question-specific n = 4,304.

\* Each vehicle was assigned the minimum Manufacturer’s Suggested Retail Price (MSRP) for that model/MY on fueleconomy.gov and does not reflect sale price. Where MSRPs were unavailable for a given MY, MSRPs from the previous or following MY were used. Tesla MSRPs do change mid-MY; Model 3’s were assigned an MSRP of \$49k for MY 2018, \$35k for MY 2019 and 2020, and \$39,990 for MY 2021. Model Y’s were assigned an MSRP of \$48k for MY 2020 and \$39,990 for MY 2021.



# Rebate Essentiality by MSRP Decreased in 2020, Particularly for Tesla

## 2019 (updated) & 2020 purchases/leases

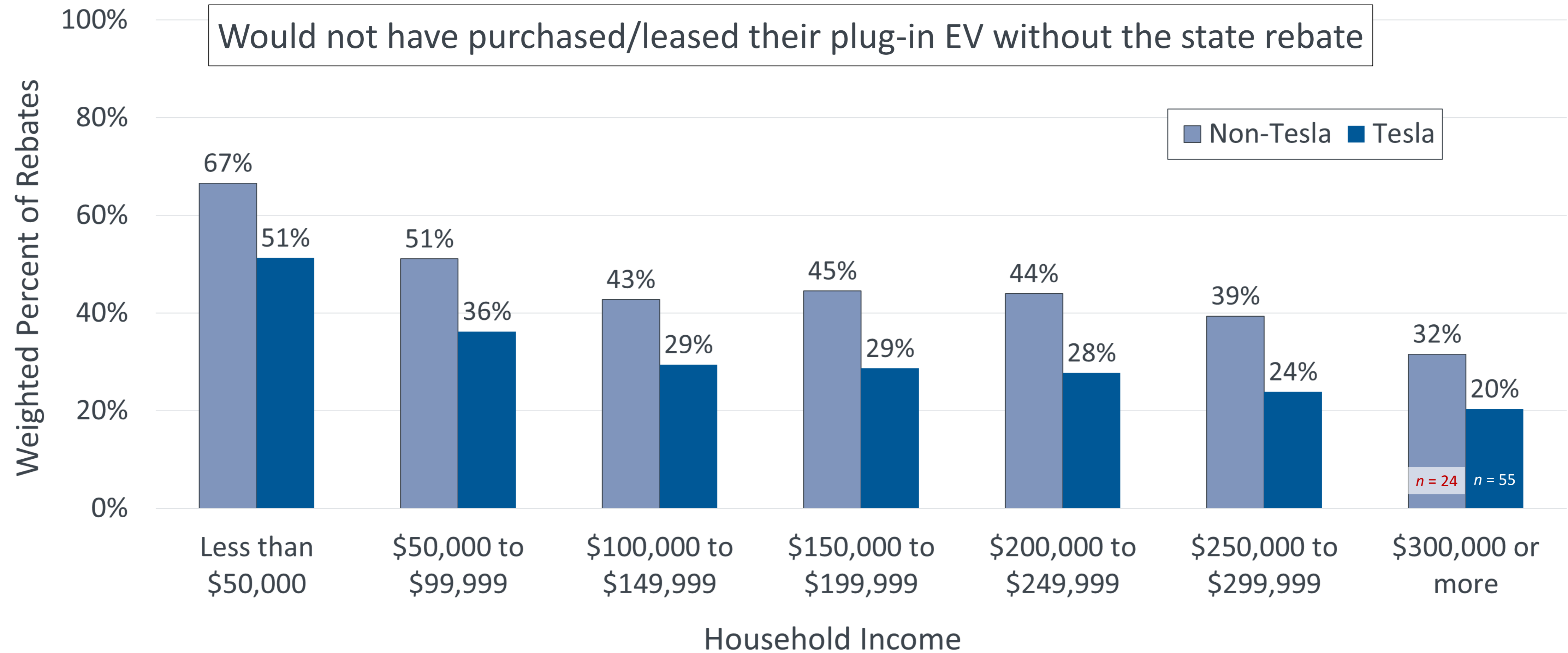


CVRP Consumer Survey, 2017–2020 Edition. 2019 *n* = 8,929. 2020 *n* = 4,304. *n*-values are filtered and question-specific. 2020 weights specific to 2020 purchases/leases. Starting 12/2019, PEVs with base MSRP > \$60k became ineligible.

\* Each vehicle was assigned the minimum Manufacturer’s Suggested Retail Price (MSRP) for that model/MY on fueleconomy.gov and does not reflect sale price. Where MSRPs were unavailable for a given MY, MSRPs from the previous or following MY were used. Tesla MSRPs do change mid-MY; Model 3’s were assigned an MSRP of \$49k for MY 2018, \$35k for MY 2019 and 2020, and \$39,990 for MY 2021. Model Y’s were assigned an MSRP of \$48k for MY 2020 and \$39,990 for MY 2021.

# Rebate Essentiality Decreases as Income Increases, Lower for Tesla

2020 purchases/leases

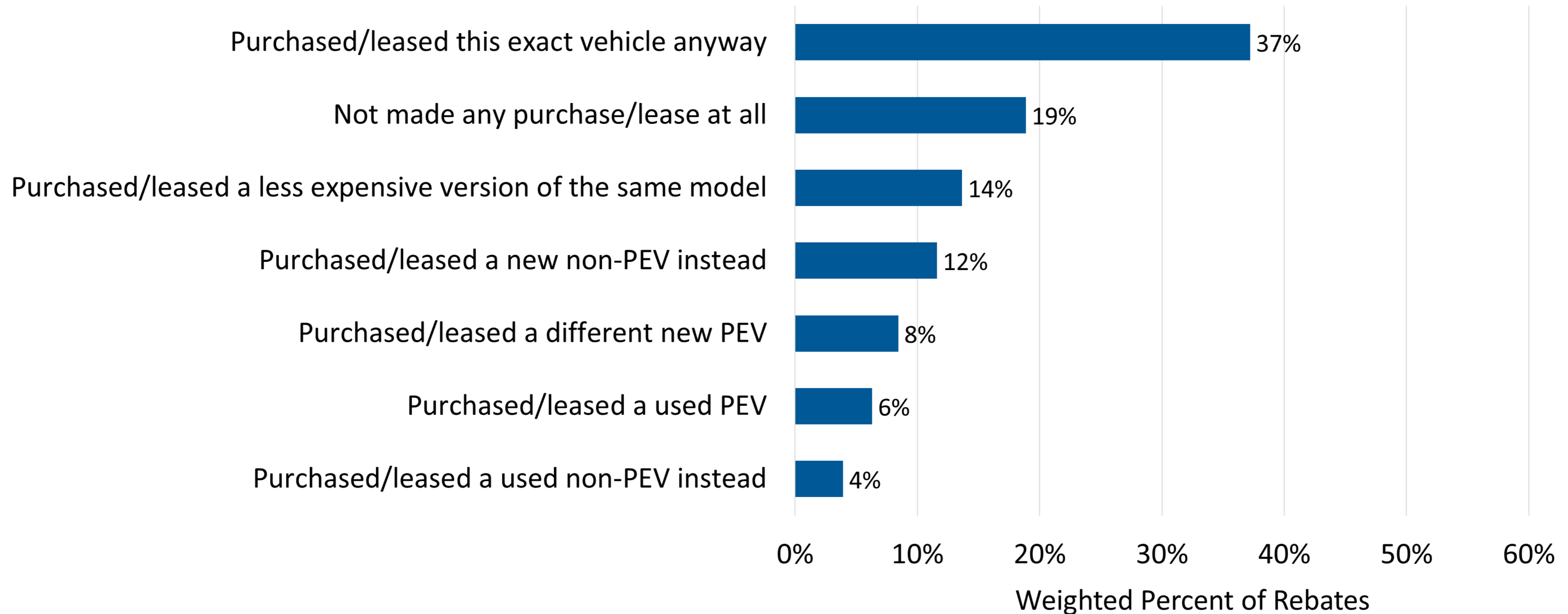




# What might have happened without the rebate?

2017–2020 purchases/leases

If CVRP were not available, what do you think you would have done?

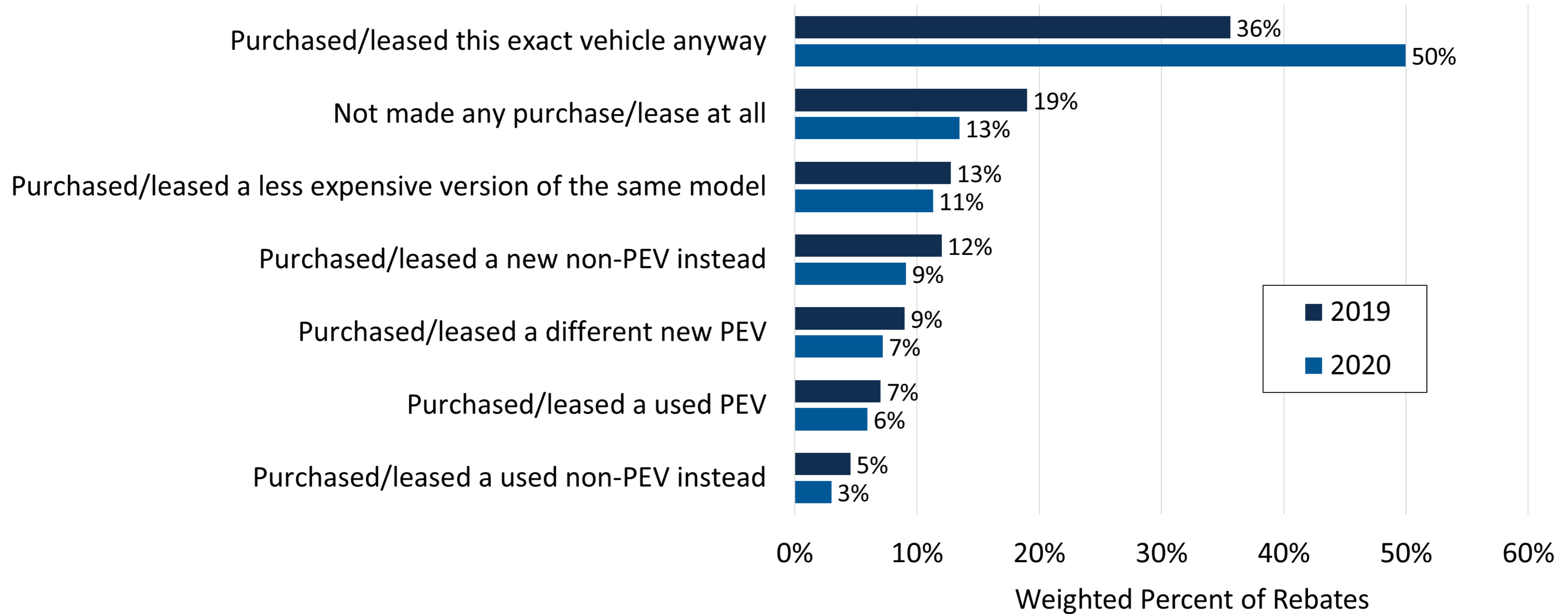


Plug-in EVs. CVRP Consumer Survey, 2017–2020 Edition. Filtered, question-specific  $n = 32,356$ .

# Recent change in what might have happened without the rebate

2019 vs. 2020 purchases/leases

If CVRP were not available, what do you think you would have done?



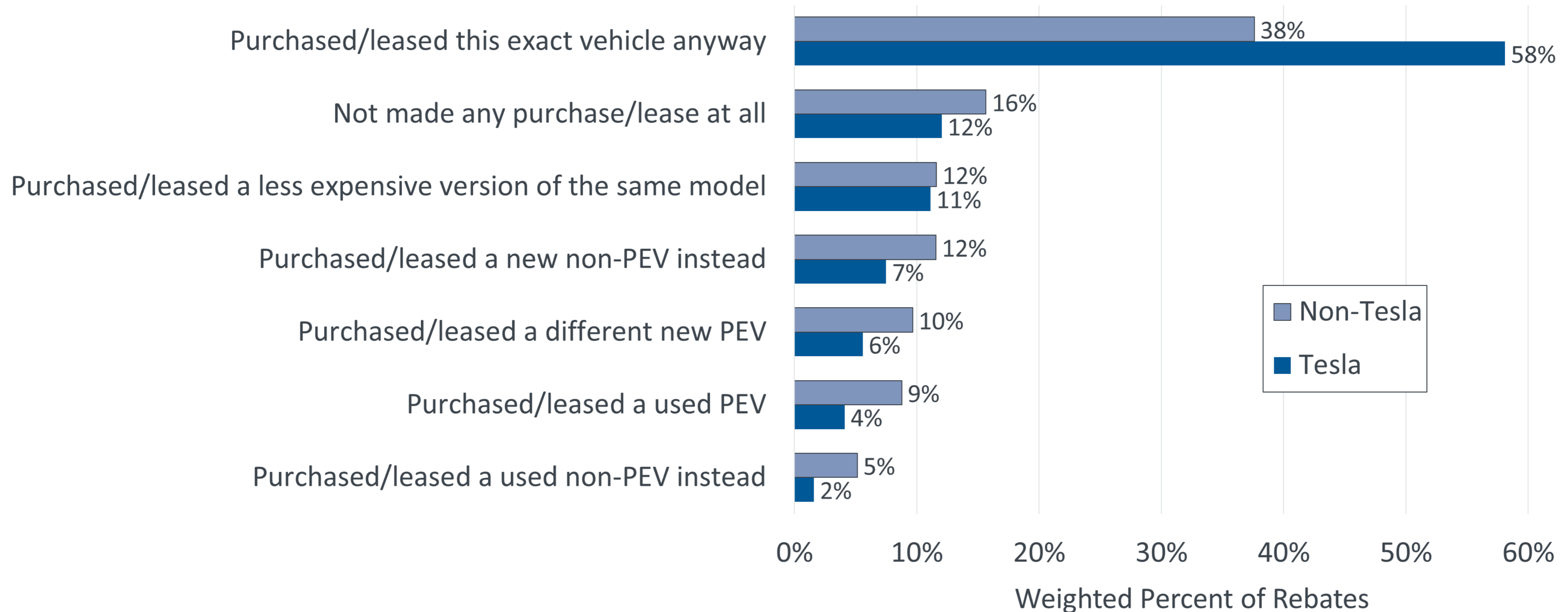
Plug-in EVs. CVRP Consumer Survey, 2017–2020 Edition. 2020 weights specific to 2020 purchases/leases. 2019 *n* = 8,940. 2020 *n* = 4,309. *n*-values are filtered and question-specific.



# Change in what might have happened without the rebate largely a Tesla effect

## 2020 purchases/leases

If CVRP were not available, what do you think you would have done?



Plug-in EVs. CVRP Consumer Survey, 2017–2020 Edition.  
 2020 weights specific to 2020 purchases/leases. Filtered, question-specific  $n = 4,309$ .



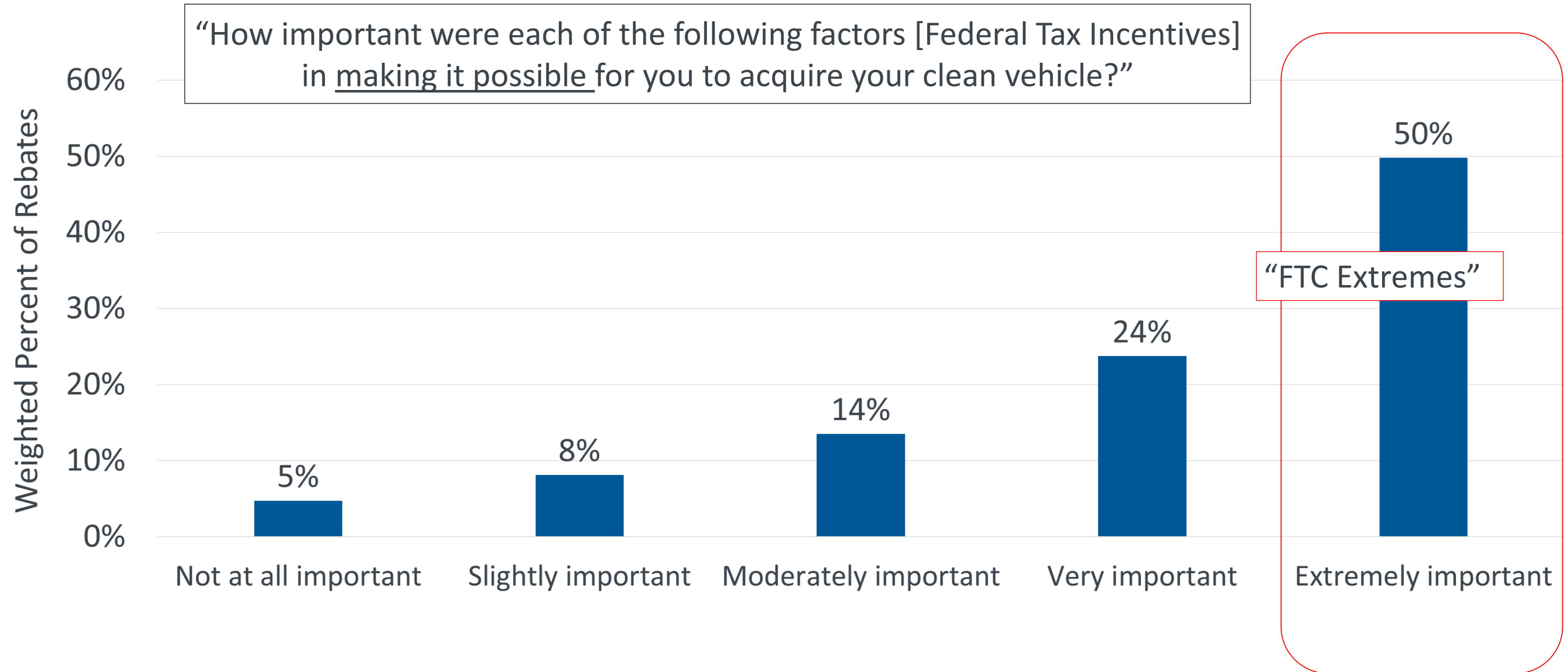


# Federal Tax Credit Influence



# Importance of Federal Tax Credit

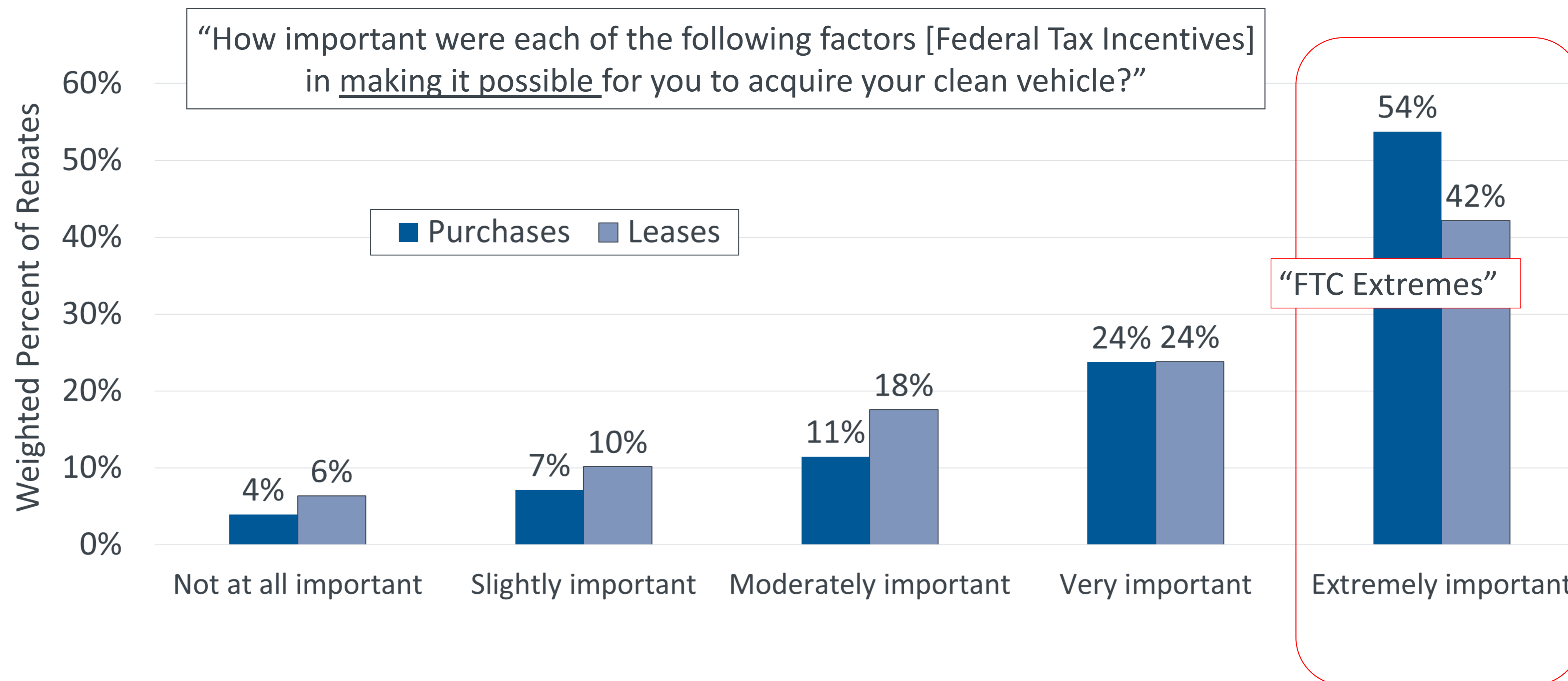
eligible\* 2020 plug-in EV purchases/leases



\* Note: federal tax credit phase-out for Tesla began 1/1/2019 and concluded 12/31/2019. Phase out for GM began 4/1/2019 and concluded 3/31/2020. During Q1 2020, GM plug-in EVs were eligible for a reduced tax credit of \$1,875.

# Importance of Federal Tax Credit: Purchases vs. Leases

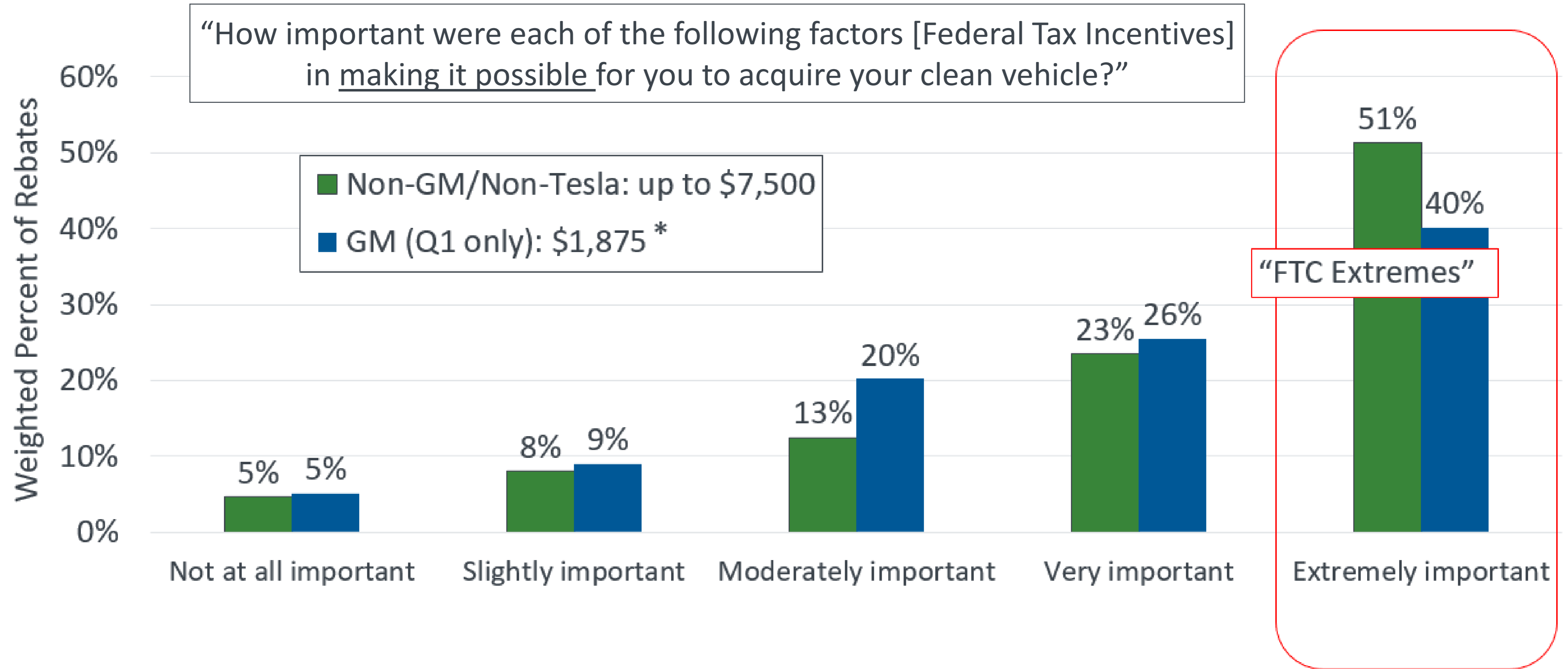
eligible\* 2020 plug-in EVs



\* Note: federal tax credit phase-out for Tesla began 1/1/2019 and concluded 12/31/2019. Phase out for GM began 4/1/2019 and concluded 3/31/2020. During Q1 2020, GM plug-in EVs were eligible for a reduced tax credit of \$1,875.

# Importance of Federal Tax Credit: GM's Reduced Credit

eligible\* 2020 plug-in EV purchases/leases

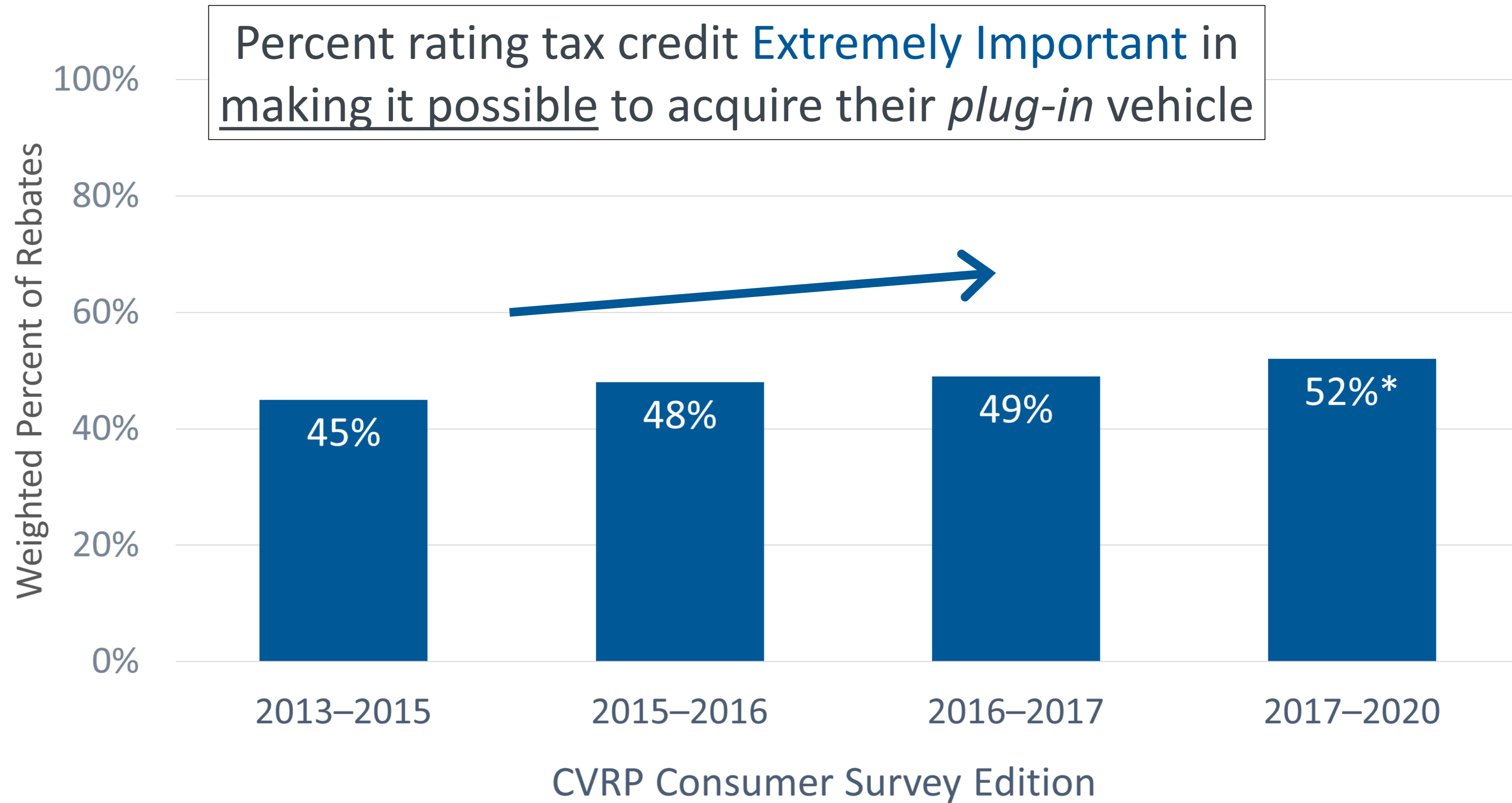


\* Note: federal tax credit phase-out for Tesla began 1/1/2019 and concluded 12/31/2019. Phase out for GM began 4/1/2019 and concluded 3/31/2020. During Q1 2020, GM plug-in EVs were eligible for a reduced tax credit of \$1,875.

CVRP Consumer Survey, 2017–2020 Edition. GM *n* = 196. Non-GM/Non-Tesla *n* = 1,354. *n*-values are filtered and question-specific.



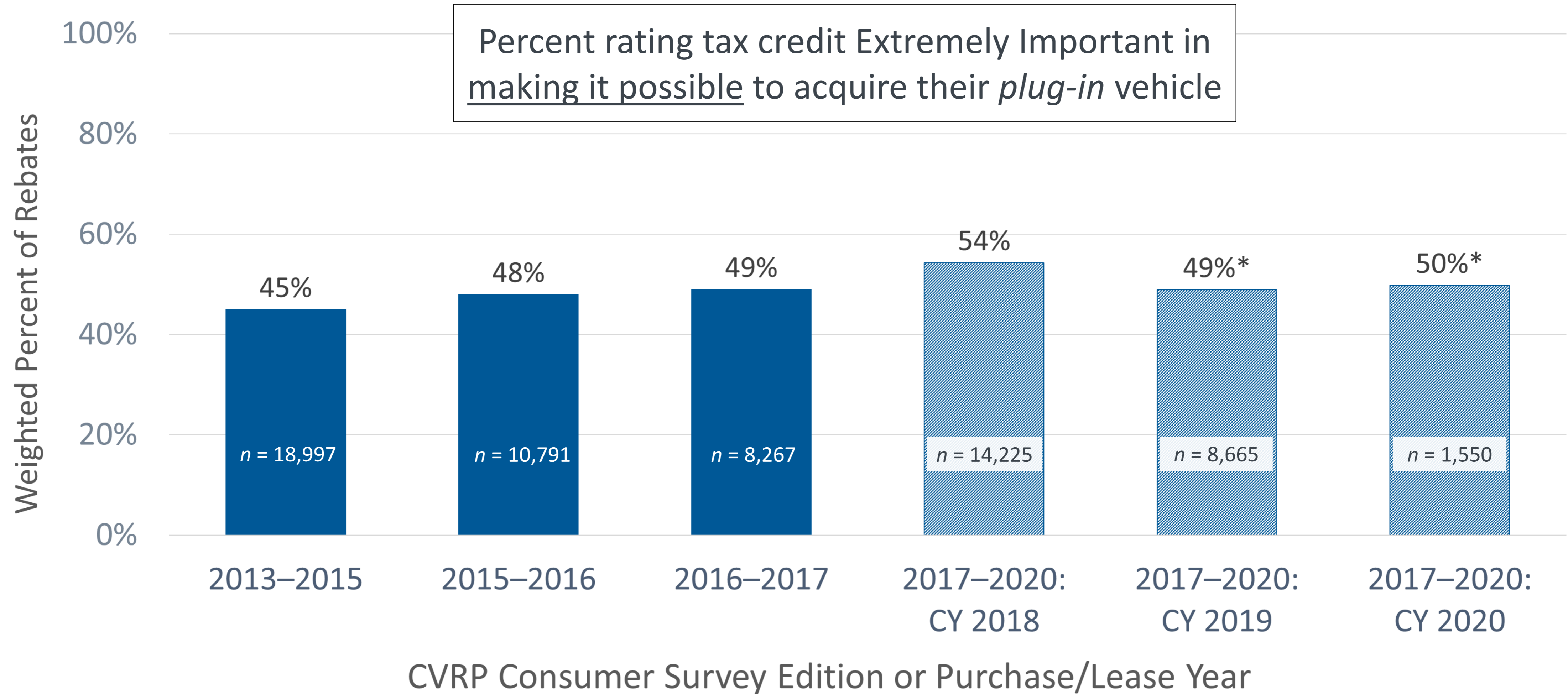
# Extreme Importance of Federal Tax Credit Is Increasing Even With Phase Out (eligible\* purchases/leases)



\* Note: federal tax credit phase-out for Tesla began 1/1/2019 and concluded 12/31/2019. Phase out for GM began 4/1/2019 and concluded 3/31/2020. Overall datasets: 72,552 total survey respondents weighted to represent 376,800 rebate recipients.

# Extreme Importance of Federal Tax Credit **Over Time**

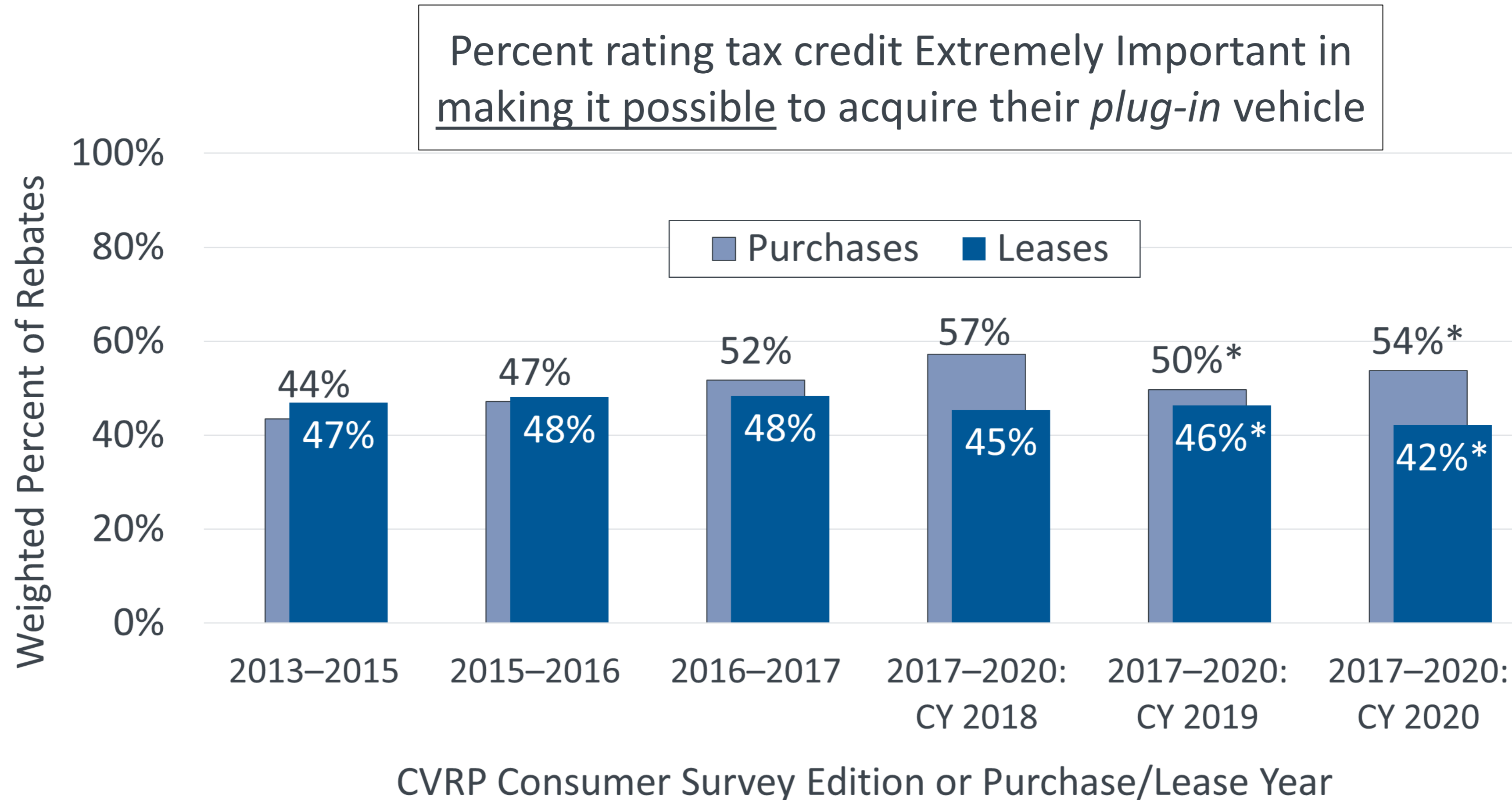
eligible\* purchases/leases



\* Note: federal tax credit phase-out for Tesla began 1/1/2019 and concluded 12/31/2019. Phase out for GM began 4/1/2019 and concluded 3/31/2020. Overall datasets: 72,552 total survey respondents weighted to represent 376,800 rebate recipients. CY 2020 weights specific to 2020 purchases/leases. n-values are filtered and question-specific.

# Extreme Importance of Federal Tax Credit Over Time

eligible\* purchases vs. leases



\* Note: federal tax credit phase-out for Tesla began 1/1/2019 and concluded 12/31/2019. Phase out for GM began 4/1/2019 and concluded 3/31/2020.

CVRP Consumer Survey, 2013–2015 Edition: filtered, question-specific  $n = 18,997$

2015–2016 Edition: filtered, question-specific  $n = 10,791$

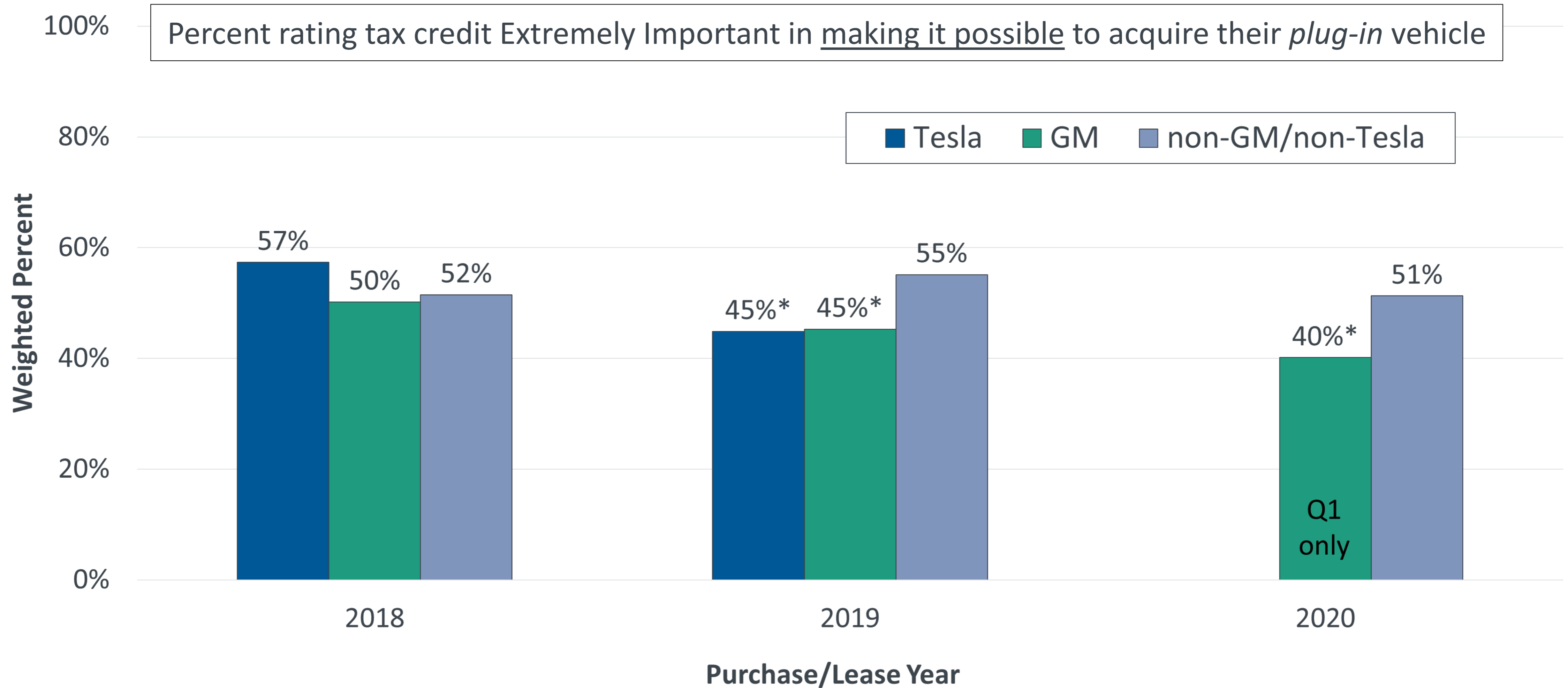
2016–2017 Edition: filtered, question-specific  $n = 8,267$

2017–2020 Edition. CY 2020 weights specific to 2020 purchases/leases. CY 2018  $n = 14,225$ . CY 2019  $n = 8,665$ . CY 2020  $n = 1,550$ .  $n$ -values are filtered and question-specific.



# Extreme Importance of Federal Tax Credit: Recent Years

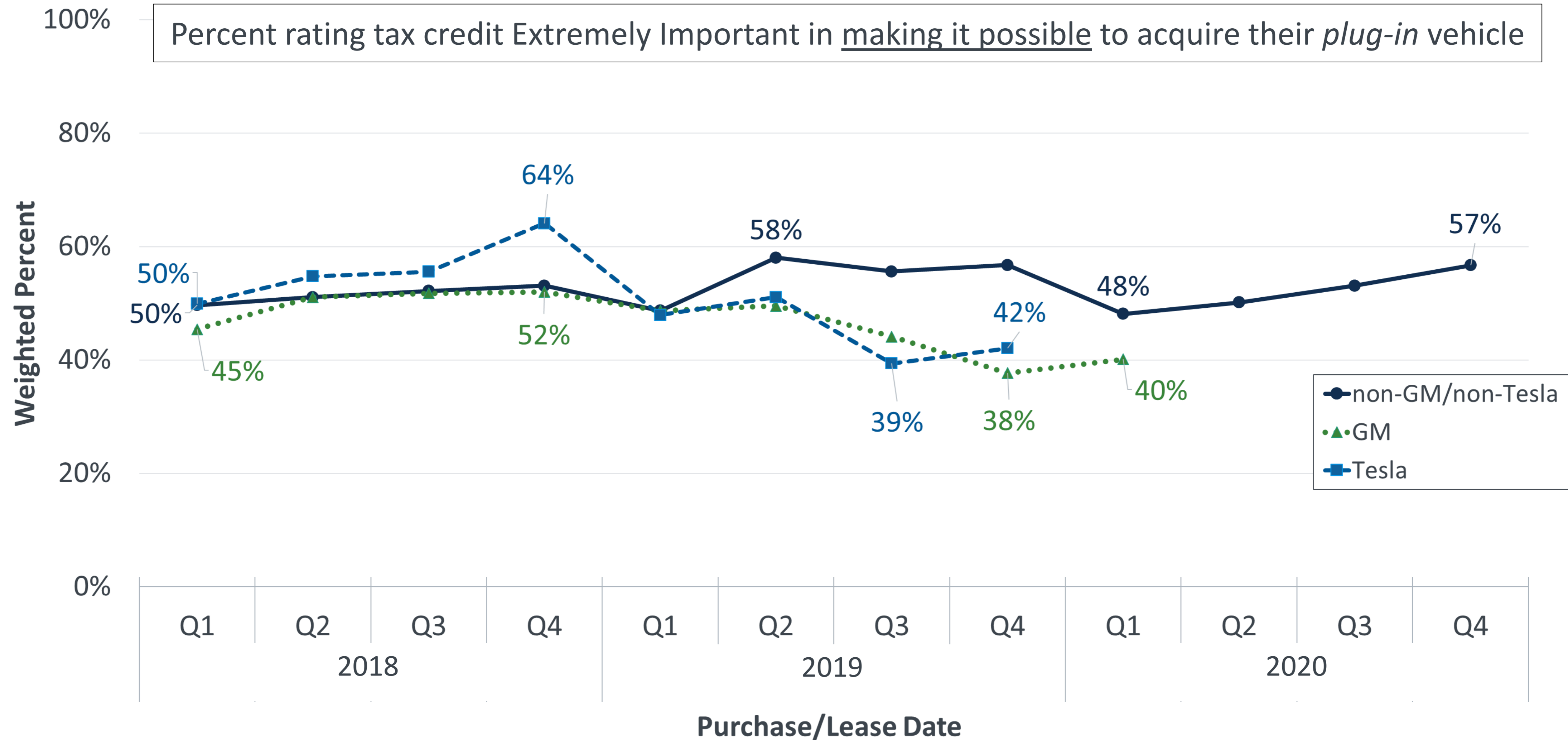
eligible\* purchases/leases



\* Note: federal tax credit phase-out for Tesla began 1/1/2019 and concluded 12/31/2019. Phase out for GM began 4/1/2019 and concluded 3/31/2020. During Q1 2020, GM plug-in EVs were eligible for a reduced tax credit of \$1,875.

CVRP Consumer Survey, 2017–2020 Edition. 2020 weights specific to 2020 purchases/leases. 2018 *n* = 14,225. 2019 *n* = 8,665. 2020 *n* = 1,550. *n*-values are filtered and question-specific.

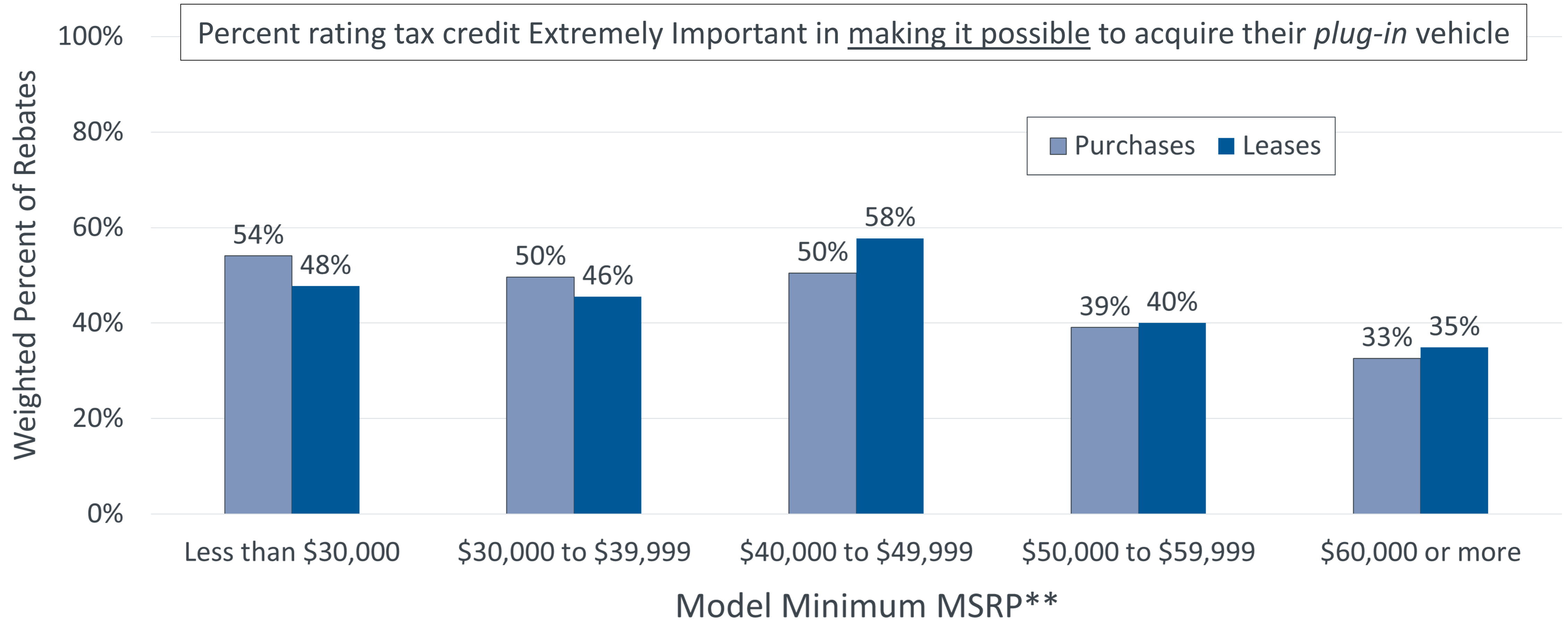
# Extreme Importance of Federal Tax Credit by Quarter



Eligible purchases/leases only. Federal tax credit phase-out for Tesla began 1/1/2019 and concluded 12/31/2019. Phase out for GM began 4/1/2019 and concluded 3/31/2020. CVRP Consumer Survey, 2017–2020 Edition. 2020 weights specific to 2020 purchases/leases. 2018: *n* = 14,225. 2019: *n* = 8,665. 2020: *n* = 1,550. *n*-values are filtered and question-specific.

# Extreme Importance of Federal Tax Credit by MSRP

2019 purchases/leases\*



CVRP Consumer Survey, 2017–2020 Edition. Filtered, question-specific n = 8,665. Starting 12/2019, PEVs with base MSRP > \$60k became ineligible.

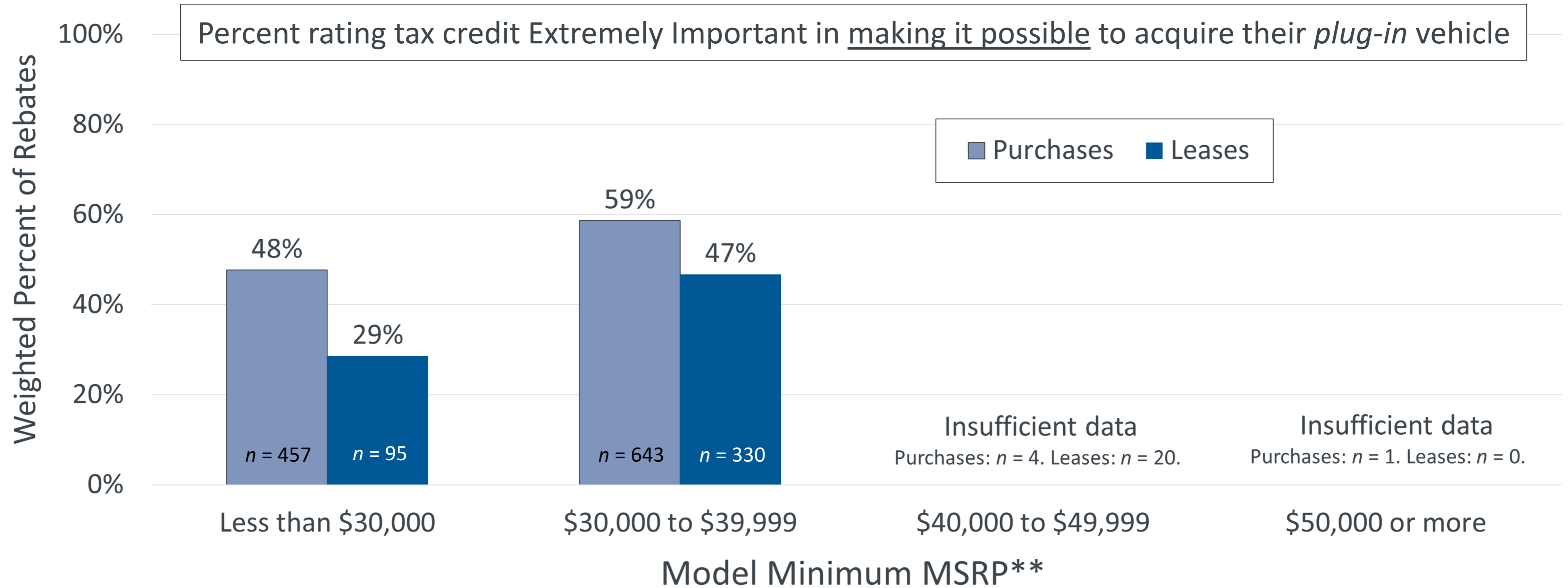
\* Note: federal tax credit phase-out for Tesla began 1/1/2019 and concluded 12/31/2019. Phase down for GM began 4/1/2019 and concluded 3/31/2020.

\*\* Each vehicle was assigned the minimum Manufacturer’s Suggested Retail Price (MSRP) for that model/MY on fueleconomy.gov and does not reflect sale price. Where MSRPs were unavailable for a given MY, MSRPs from the previous or following MY were used. Tesla MSRPs do change mid-MY; Model 3’s were assigned an MSRP of \$49k for MY 2018, \$35k for MY 2019 and 2020, and \$39,990 for MY 2021.



# Extreme Importance of Federal Tax Credit by MSRP

eligible\* 2020 purchases/leases



CVRP Consumer Survey, 2017–2020 Edition. Filtered, question-specific n = 1,550.

\* Note: federal tax credit phase-out for Tesla began 1/1/2019 and concluded 12/31/2019. Phase out for GM began 4/1/2019 and concluded 3/31/2020.

\*\* Each vehicle was assigned the minimum Manufacturer’s Suggested Retail Price (MSRP) for that model/MY on fueleconomy.gov and does not reflect sale price. Where MSRPs were unavailable for a given MY, MSRPs from the previous or following MY were used. Tesla MSRPs do change mid-MY; Model 3’s were assigned an MSRP of \$49k for MY 2018, \$35k for MY 2019 and 2020, and \$39,990 for MY 2021. Model Y’s were assigned an MSRP of \$48k for MY 2020 and \$39,990 for MY 2021.



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 public charging station with several orange charging cables is visible, along with a blurred city street scene.

# Summary & Select Findings



# Summary & Select Findings: Rebate Influence

## Context: program design and COVID-19 shaped impacts in 2020

- \$60k MSRP cap and \$500 decrease in standard rebate amounts as of Dec. 2019
- COVID-19 caused an anomalous year in several respects

## 2020 Incentive Influence:

### ***CVRP Rebates***

- 82% found the rebate an important enabler of their EV acquisition
- 38% would not have purchased/leased without it
  - 31% for Teslas, but 47% for PHEVs, 50% for non-Tesla BEVs, 66% for Increased Rebate recipients
- Rebate influence decreased from 2019 to 2020, primarily for Tesla consumers
- Tesla rebate influence decreases as MSRP increases
- Rebate influence decreases as income increases, particularly for Tesla
- Attractive offerings (including SUVs and Tesla products) have lower *Rebate Essentiality*

### ***Federal-tax-credit (FTC)***

- FTC influence more steady
- 50% of FTC-eligible CVRP consumers rated FTC an “Extremely Important” enabler
  - 54% for purchases, 42% for leases (often claimed by the leasing company)
- Data confirm influence decreased for Tesla and GM as FTC phased down and out
- 2019 FTC influence decreases above \$50,000 MSRP
- Relative to 2019, 2020 influence increased for MSRP \$30k–40k, but *decreased* for MSRP<\$30k



A close-up photograph of a person's 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 public charging station with several orange charging cables is visible, along with a building and a bicycle parked nearby. The overall atmosphere is warm and modern.

# Additional Details & Resources



# Funding Availability Has Been Regularly Disrupted

(as of Sept. 2021)



**Table 4: CVRP Waitlists**

Waitlist Year	Start Date	End Date	Length in Days
2011*	Jun. 20	Sept. 30	102
2013*	May 1	Jun. 30	60
2014	Mar. 28	Jul. 22	116
2016	Jun. 11	Sept. 28	109
2017**	Jun. 30	Nov. 20	143
2019**	Jun. 5	Sept. 23	110
2021	Apr. 23	Sept. 15	145

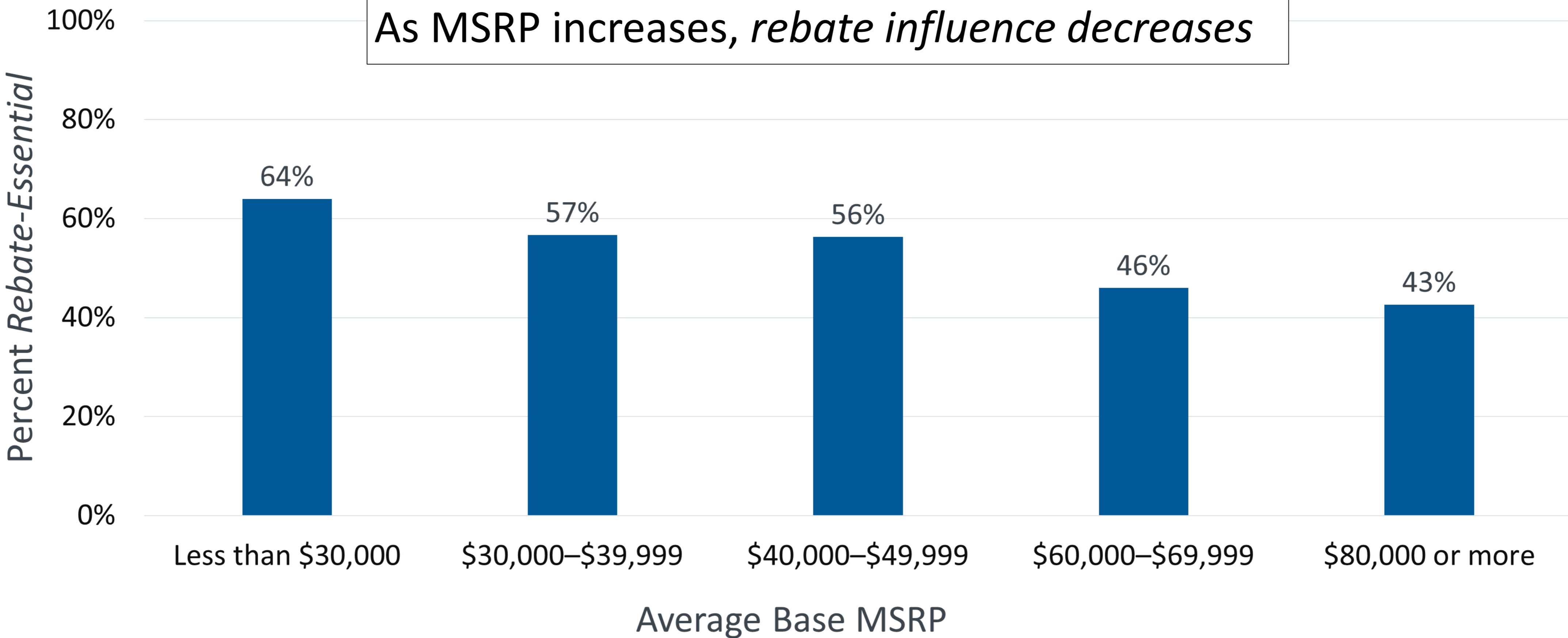
\* *Dates approximate.*

\*\* *For standard applications only; no waitlist for income-qualified increased rebates.*



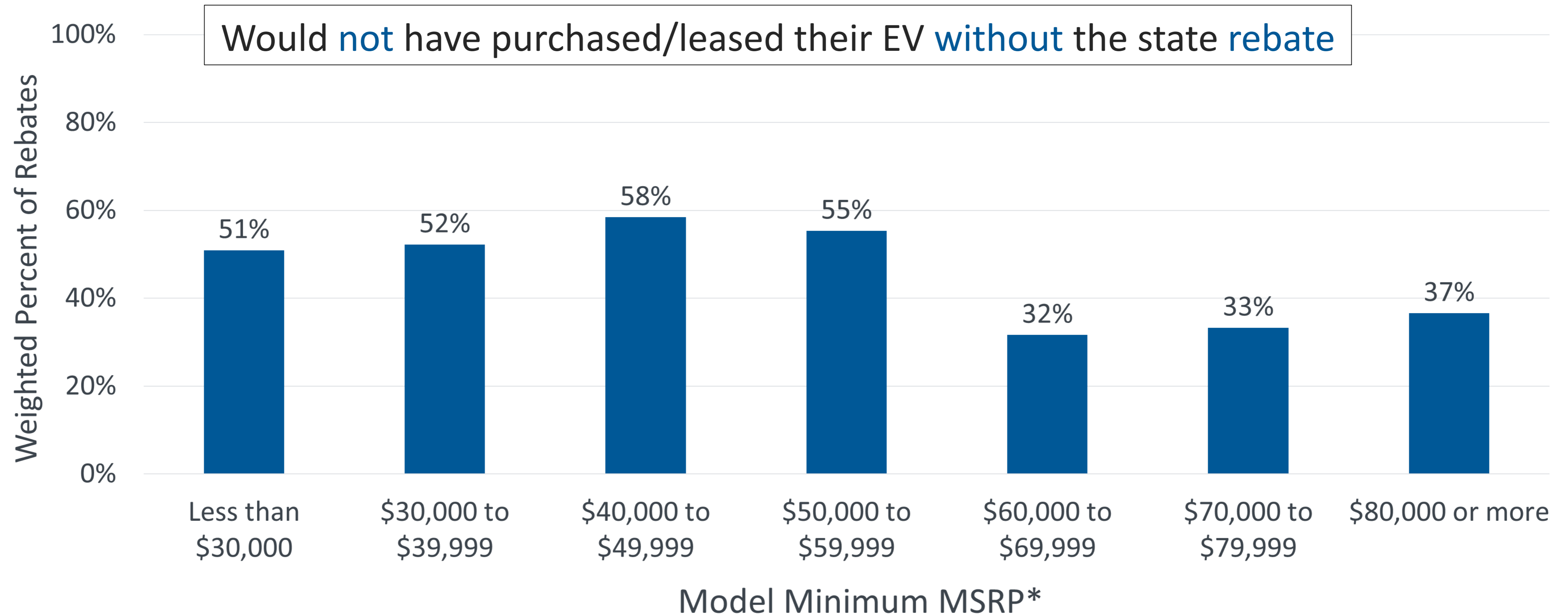
# Rebate Essentiality Reflects Interesting Trends

Consumer Survey, 2016–17 Edition



# Rebate Essentiality Decreases Above \$60k MSRP

2019 purchases/leases, **updated**

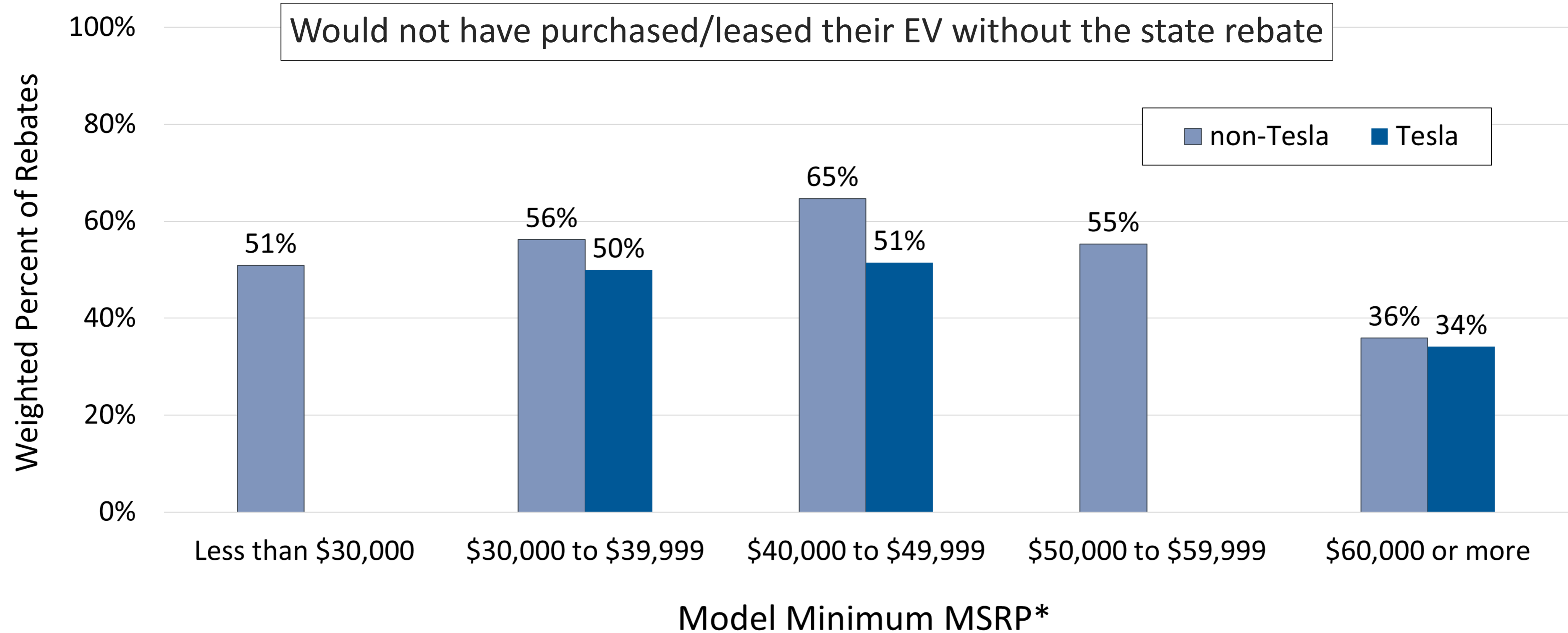


CVRP Consumer Survey: 2017–2020 Edition. Filtered question-specific  $n = 8,929$ . Starting 12/2019, PEVs with base MSRP > \$60k became ineligible.

\* Each vehicle was assigned the minimum Manufacturer's Suggested Retail Price (MSRP) for that model/MY on fueleconomy.gov and does not reflect sale price. Where MSRPs were unavailable for a given MY, MSRPs from the previous or following MY were used. Tesla Model 3's were assigned an MSRP of \$49k for MY 2018, \$35k for MY 2019 and 2020.

# Rebate Essentiality Similar But Lower for Tesla

2019 purchases/leases, **updated**



CVRP Consumer Survey, 2017–2020 Edition. Filtered, question-specific n = 8,929. Starting 12/2019, PEVs with base MSRP > \$60k became ineligible.





\* Each vehicle was assigned the minimum Manufacturer’s Suggested Retail Price (MSRP) for that model/MY on fueleconomy.gov and does not reflect sale price. Where MSRPs were unavailable for a given MY, MSRPs from the previous or following MY were used.

Tesla MSRPs do change mid-MY; Model 3’s were assigned an MSRP of \$49k for MY 2018, \$35k for MY 2019 and 2020, and \$39,990 for MY 2021.



# Consumer Survey Data

(shows rebates to individuals only)

					<b>Total</b>
<b>Vehicle Purchase/ Lease Dates</b>	Sep. 2012* – Dec. 2019	Jun. 2014 – Apr. 2020	May 2015 – Sep. 2018	Mar. 2017 – Jul. 2018	Sep. 2012* – Apr. 2020
<b>Survey Responses (total n)**</b>	66,902	6,616	1,565	1,808	76,891
<b>Program Population (N)***</b>	339,200	16,100	3,500	8,600	367,400

Includes fuel-cell EVs (CVRP only).

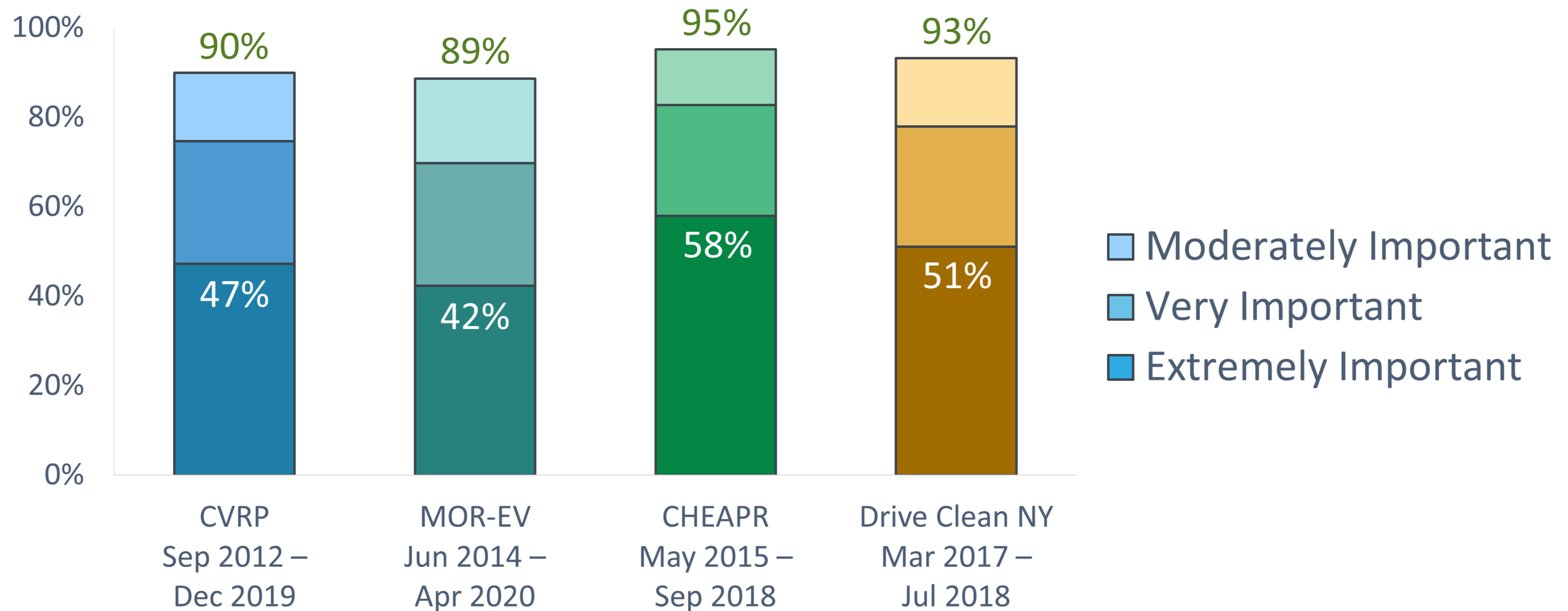
\*Two fuel-cell EVs rebated by CVRP with purchase/lease dates from Dec. 2010 – Sep. 2012 are included.

\*\* Subsequently weighted to represent the program population along the dimensions of vehicle category, model, buy vs. lease, and county.

\*\*\* Small numbers of rebated vehicles are not represented in the time frames due to application lags. Rounded to nearest 100.

# Rebate Influence: Importance

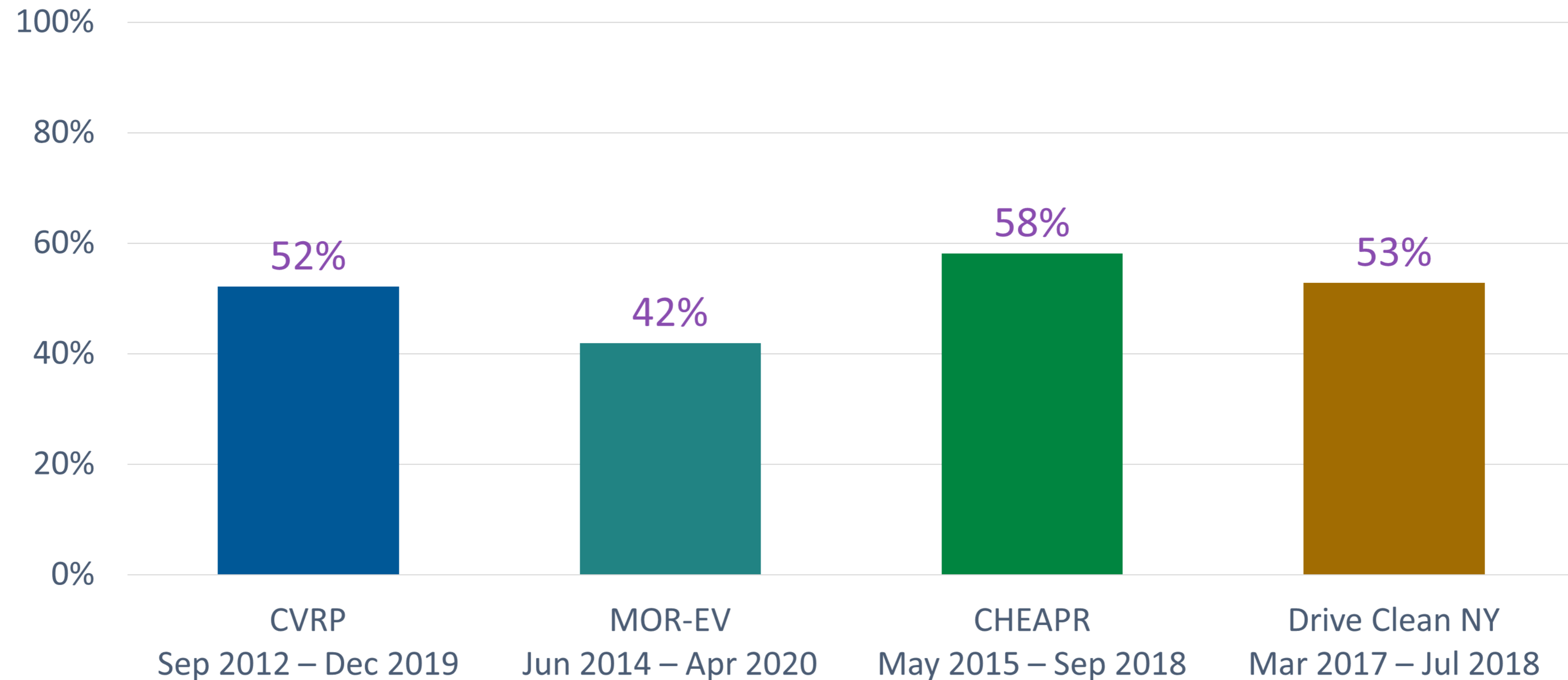
How **important** was the state rebate in **making it possible** for you to acquire your clean vehicle?



Includes fuel-cell EVs (CVRP only). Overall datasets: 76,891 total survey respondents weighted to represent 367,400 rebate recipients.

# Rebate Influence: Essentiality

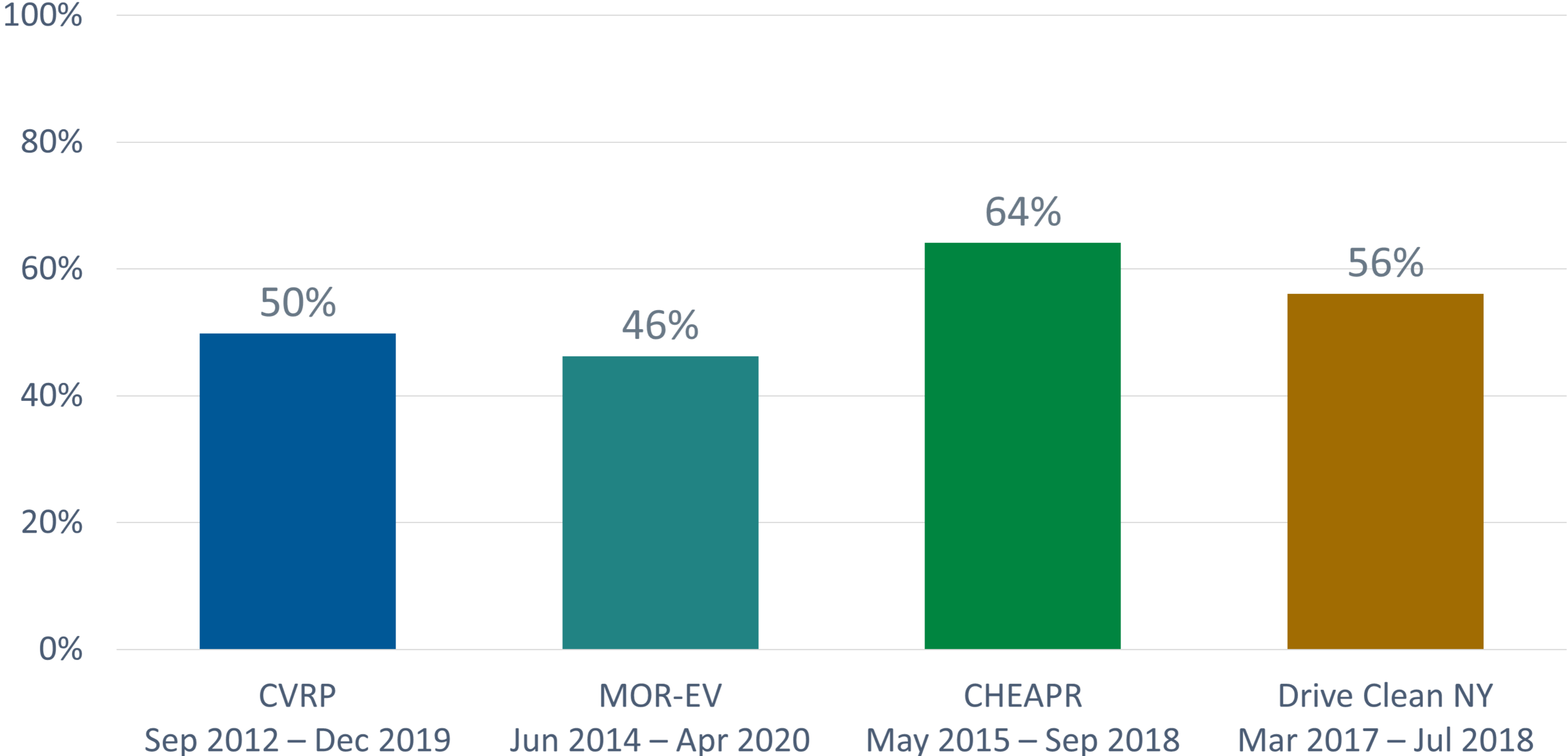
Would **not** have purchased/leased their clean vehicle **without rebate**



Includes fuel-cell EVs (CVRP only). Overall datasets: 76,891 total survey respondents weighted to represent 367,400 rebate recipients.



# Percent Rating the Federal Tax Credit “Extremely Important” (“...in making it possible” to acquire *plug-in* EVs)



Overall datasets: 75,632 total survey respondents weighted to represent 360,800 rebate recipients.

# Select Publications (reverse chronological, as of 3/2022)



- N. Pallonetti and B.D.H. Williams (2022, Jan.), [“Evaluating the Cost-Effectiveness of Greenhouse Gas Emission Reductions Associated with Statewide Electric Vehicle Rebate Programs in California and Massachusetts in 2019,”](#) for *International Energy Program Evaluation Conference 2022*.
- Williams, B. D. H. (2022, Jan.), [Brief: PHEV Consumers Most Highly Influenced by the U.S. Federal Tax Credit.](#) Clean Vehicle Rebate Project
- B.D.H. Williams (2021, Oct.), [An Electric-Vehicle Consumer Segmentation Roadmap: Strategically Amplifying Participation in the New York Drive Clean Rebate Program,](#) NYSERDA Report 21-30.
- N. Pallonetti and B. D. H. Williams (2021, Jul.), [“Refining Estimates of Fuel-Cycle Greenhouse-Gas Emission Reductions Associated with California’s Clean Vehicle Rebate Project with Program Data and Other Case-Specific Inputs,”](#) *Energies*, vol. 14, no. 15.
- B. D. H. Williams and J. B. Anderson (2021, Mar.), [“Strategically Targeting Plug-In Electric Vehicle Rebates and Outreach Using ‘EV Convert’ Characteristics,”](#) *Energies*, vol. 14, no. 7, p. 1899.
- B.D.H. Williams, J.B. Anderson, A. Lastuka (2020, Sep.), [Characterizing Plug-in Hybrid Electric Vehicle Consumers Who Found the U.S. Federal Tax Credit Extremely Important in Enabling Their Purchase,](#) in: *33rd Electr. Veh. Symp.*, Electric Drive Transportation Association (EDTA), EVS33 and Zenodo, Portland OR.
- S. Hardman, P. Plötz, G. Tal, J. Axsen, E. Figenbaum, P. Jochem, S. Karlsson, N. Refa, F. Sprei, B.D. Williams, J. Whitehead, B. Witkamp (2019), [Exploring the Role of Plug-In Hybrid Electric Vehicles in Electrifying Passenger Transportation,](#) International EV Policy Council, UC Davis Plug-in Hybrid and Electric Vehicle Research Center.
- B.D. Williams, J. Orose, M. Jones, J.B. Anderson (2018, Oct.), [Summary of Disadvantaged Community Responses to the Electric Vehicle Consumer Survey, 2013–2015 Edition.](#) Clean Vehicle Rebate Project.
- B.D. Williams, J.B. Anderson (2018, Sep.), [Strategically Targeting Plug-in Electric Vehicle Rebates and Outreach Using Characteristics of “Rebate-Essential” Consumers in 2016–2017,](#) in: *31st Int. Electr. Veh. Symp.*, Society of Automotive Engineers of Japan, Inc., Kobe, Japan.
- C. Johnson, B.D. Williams, J.B. Anderson, N. Appenzeller (2017, Jun.), [Evaluating the Connecticut Dealer Incentive for Electric Vehicle Sales,](#) Center for Sustainable Energy (CSE).
- C. Johnson, B.D. Williams (2017, Jan.), [Characterizing Plug-In Hybrid Electric Vehicle Consumers Most Influenced by California’s Electric Vehicle Rebate,](#) *Transp. Res. Rec.* 2628, 23–31.

# Select Presentations (reverse chronological, as of 3/2022)



- [CVRP 2020 Data Brief: Consumer Characteristics](#)
- [Cost-Effectiveness of Greenhouse Gas Emission Reductions Associated with California’s Clean Vehicle Rebate Project in 2019 \(and 2020\)](#)
- [California Plug-in Hybrid EV Consumers Who Found the U.S. Federal Tax Credit Extremely Important in Enabling Their Purchase](#)
- [Data from Statewide Electric Vehicle Rebate Programs: Vehicles, Consumers, Impacts, and Effectiveness](#)
- [CVRP CY 2019 Data Brief: Vehicle Replacement & Incentive Influence](#)
- [CVRP CY 2019 Data Brief: Consumer Characteristics](#)
- [CVRP Data Brief: MSRP Considerations](#)
- [EV Purchase Incentives: Program Design, Outputs, and Outcomes of Four Statewide Programs with a Focus on Massachusetts](#)
- [What Vehicles Are Electric Vehicles Replacing and Why?](#)
- [Electric Vehicle Incentives and Policies](#)
- [Proposed FY 2019–20 Funding Plan: Final CVRP Supporting Analysis](#)
- [CVRP: Data and Analysis Update](#)
- [Cost-Effectively Targeting EV Outreach and Incentives to “Rebate-Essential” Consumers](#)
- [Electric Vehicle Rebates: Exploring Indicators of Impact in Four States](#)
- [Targeting EV Consumer Segments & Incentivizing Dealers](#)
- [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 Findings](#)
- [CVRP Income Cap Analysis: Informing Policy Discussions](#)



Recommended citation:

B.D.H. Williams and N. Pallonetti, Presentation: “CVRP 2020 Data Brief: Incentive Influence,” Clean Vehicle Rebate Project, administered by the Center for Sustainable Energy on behalf of the California Air Resources Board, May 2022.

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

 [CleanVehicleRebate.org](https://CleanVehicleRebate.org)

