

**Appendix C: Updated Long-Term Plan for Light-Duty Zero-Emission
Vehicle Market, Light-Duty Vehicle Purchase Incentives, Clean
Mobility Investments, and Outreach**

**As required by Senate Bill 1275 and the Supplemental Report of the
2018-19 Budget Act**

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Introduction

Overview

Since the introduction of the first Light-Duty Long-Term Plan in fiscal year (FY) 2016-17, the zero-emission vehicle (ZEV) market has grown tremendously. Various events over the last few years, including the ongoing effects of the California Air Resources Board's (CARB) many years of ZEV and other automobile air pollution regulations, the introduction of new vehicles (there are now over 100 electric vehicle models in the U.S.), and clean mobility programs, have improved the ZEV market landscape. Moreover, CARB's regulation to greatly increase the stringency of its ZEV program, requiring 100% ZEV sales by 2035, will further stabilize the market. CARB's robust regulations have supported record ZEV sales with steady growth year-over-year.¹ In order to ensure that no one is left behind in the ZEV transition, major changes were made to light-duty incentive programs in FY 2022-23 to focus funding on those who need the most help in getting into a cleaner vehicle. Along with targeted incentive programs, continuing regulatory efforts will enhance project sustainability to better foster market growth, especially in harder to reach market segments.

Complementary to the Light-Duty Long-Term Plan, starting with the FY 2014-15 Funding Plan, CARB has established several clean mobility projects. During these initial years, staff and project grantees learned several lessons and overcame a variety of implementation challenges. This year's update to the Long-Term Plan provides updates on the light-duty ZEV market and projected three-year funding needs for light-duty incentive programs.

CARB's priorities for these investments include continued facilitation of coordination across projects, increased community engagement and participation, ensuring best practices and lessons learned are shared, and helping projects expand on larger scales. CARB continues to assess clean mobility projects to identify strategies for project sustainability and independent operations with the goal that projects can continue operating in communities without the dependence on future Low Carbon Transportation funding.

Statutory Goals and Requirements

Senate Bill (SB) 1275 (De León, Chapter 530, Statute of 2014) established the Charge Ahead California Initiative with the goals of placing one million zero-emission and near zero-emission vehicles in California by 2023 to establish a self-sustaining market and increasing access to these vehicles for lower-income consumers and consumers

¹ California Air Resources Board. *Snapshot: Zero-emission Vehicle Market Trends*. (April 24, 2024). <https://ww2.arb.ca.gov/resources/fact-sheets/snapshot-zero-emission-vehicle-market-trends>

in disadvantaged communities. Among other requirements, SB 1275 required CARB to include a Long-Term Plan for the Clean Vehicle Rebate Project (CVRP) and related programs in the FY 2016-17 Funding Plan and to update the plan every three years. The plan must include: a three-year forecast of funding needs to support the goals of technology advancement, market readiness and consumer acceptance of advanced vehicle technologies, a market and technology assessment for each funded vehicle technology, and an assessment of when a self-sustaining market is expected and how existing incentives may be modified to recognize expected changes in future market conditions.

In addition, the Supplemental Report to the 2018-19 Budget Act² requires CARB to annually update the CVRP forecast until January 1, 2030, and include as part of its forecast the total State rebate investment necessary to facilitate reaching the goal of placing in service at least five million ZEVs by January 1, 2030, specifically including:

- *Models of the impacts of various rebate scenarios' ability to maximize the effectiveness of the rebates provided based on relevant data.*
- *Annual recommendations for changes to the project structure and various rebate levels based on market demand to reach the 2030 goal, including the project's income eligibility requirements to target moderate and low-income customers.*
- *Projected sales figures of electric vehicles.*
- *Impacts of federal policy changes on the adoption of electric vehicles.*
- *Assessment of marketing efforts of electric vehicles by automobile manufacturers.*
- *Survey results of consumer awareness and acceptance of electric vehicles and awareness of the benefits associated with ZEVs.*

As part of the FY 2016-17 Funding Plan, staff, in consultation with stakeholders proposed a framework for the three-year plan and provided the first three-year funding needs forecast along with a market and technology assessment. Staff also proposed a suite of indicators to measure ZEV market growth over time. Although SB 1275 required CARB to update the plan every three years, staff has provided updates to all components of the plan each year since 2016. Staff provided the first major update to the plan in the FY 2019-20 Funding Plan and the second in the FY 2022-23 Funding Plan. This year's plan provides a minor update to the ZEV market information provided in FY 2023-24 as well as CARB's clean vehicle purchase incentive programs, clean mobility investments, and outreach efforts.

² Legislative Analyst's Office. (2018). *Supplemental report of the 2018-19 Budget Act*. <https://lao.ca.gov/reports/2018/3883/supplemental-language-2018.pdf>

Part 1: Light-Duty Zero-Emission Vehicle Market Update and Light-Duty Vehicle Purchase Incentives

Light-Duty Zero-Emission Vehicle Market and Technology Assessment

In this section of the Long-Term Plan, staff updates the ZEV Market and Technology Assessment originally included in the FY 2016-17 Funding Plan as required by SB 1275. As part of this assessment, staff presents:

- An overview of recent ZEV market growth in California, the United States, and worldwide.
- Analysis of the growing used ZEV market in California.
- An update on the state of ZEV technology, particularly battery costs and a comparison of the total cost of ownership of ZEVs compared to internal combustion engine vehicles.
- Update of ZEV infrastructure in California.

Several of the topics covered here such as growth in ZEV sales, market share, and vehicle diversity are also indicators that staff uses to evaluate progress toward a sustainable ZEV market in California. As such, California-specific trends for each of these indicators are discussed in greater detail in the “Sustainable ZEV Market” section later in this Long-Term Plan.

Trends in the Light-Duty Zero-Emission Vehicle Market

A record-breaking near-14 million ZEVs were sold worldwide in 2023, a 35% year-over-year increase when compared to 2022, and 600% the amount in 2018, just five years earlier.³ According to Global ZEV Outlook 2023, ZEV sales accounted for nearly 18% of all global vehicle sales in 2023, up from 14% in 2022, and a ninefold increase from the 2018 market share.⁴ This brings the total number of ZEVs on the world’s roads to roughly 40 million, 1.5 times the amount in 2012.⁵ China maintains the largest ZEV fleet in the world, adding an additional 8.1 million ZEV registrations in 2023, increasing 35% relative to 2022.⁶ Europe registered an additional 3.2 million electric cars, increasing the ZEV penetration that it had at the end of 2022 (7.8 million), to reach approximately 11 million ZEVs.⁷ The United States came in third

³ International Energy Agency. Global ZEV Outlook 2024. [Global EV Outlook 2024](https://www.iea.org/publications/global-zev-outlook-2024) ([iea.blob.core.windows.net](https://www.iea.org/publications/global-zev-outlook-2024))

⁴ Ibid

⁵ Ibid

⁶ Ibid

⁷ Ibid

registering an additional 1.4 million ZEVs in 2023.⁸ All these markets experienced increases in zero-emission vehicle sales compared to previous years, despite the changes in government subsidies, tax credits, and electric vehicle and battery manufacturing requirements.⁹

While the ZEV market share continues to increase in more established markets, ZEV adoption in emerging markets and developing economies has rapidly increased over the last few years. ZEV registrations in 2023 in countries such as India, Thailand, and Mexico were up 70 to 80 percent year-on-year.¹⁰ ZEV registrations in Vietnam, Malaysia, Brazil, Colombia, and Costa Rica doubled or tripled in the same period.¹¹ This suggests that ZEVs are gaining momentum across various markets all over the world.

The record spike in gas prices that started in early 2022 spurred an increased demand for ZEVs and hybrids.¹² Gas prices are substantially lower than the record high in July 2022 but remain relatively high. As of August 28, 2024, Californians are paying on average \$4.622 per gallon. While this is down from the California average of \$5.287 per gallon on the same day in 2023, it is still significantly higher than the national average of \$3.819 per gallon.¹³ The California Energy Commission is also taking a closer look at what is driving higher gas prices. *Senate Bill X1-2*, the California Gas Price Gouging and Transparency Law, which took effect in June 2023, aims to protect Californians from price gouging by oil companies. The law provides transparency and oversight measures through the California Energy Commission to increase accountability of the oil industry and helps the state understand and respond to spikes in gas prices.

After comprising almost 13% of light-duty vehicle sales in 2021, ZEV sales made up over 25% of vehicle sales in 2023.¹⁴ This, along with price decreases, continued consumer interest, and use of lower cost battery technology are positive signs regarding the growth and sustainability of the ZEV market.

⁸ Ibid

⁹ Ibid

¹⁰ Global EV Outlook 2024: Trends in electric cars. (2024, April). International Energy Agency. <https://www.iea.org/reports/global-ev-outlook-2024/trends-in-electric-cars>

¹¹ Ibid.

¹² Charged Fleet. Interest in ZEVs and Hybrids Spikes as Fuel Prices Soar. March 29, 2022. <https://www.chargedfleet.com/10164307/interest-in-evs-and-hybrids-spike-as-fuel-prices-soar>

¹³ AAA California Average Gas Prices. American Automobile Association. Retrieved August 28, 2024, from <https://gasprices.aaa.com/?state=CA>

¹⁴ California Energy Commission (2024). New ZEV Sales in California. Data last updated May 1, 2024. Retrieved July 29, 2024, from <https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/new-ZEV-sales>

On August 25, 2022, the Board adopted the Advanced Clean Cars II Regulation.¹⁵ The Advanced Clean Cars II Regulation¹⁶ takes the State's already robust motor vehicle emission control rules and enhances them to meet more aggressive tailpipe emissions standards and ramp up to 100% new zero-emission vehicle sales by 2035. The Advanced Clean Cars II Regulation will rapidly scale down light-duty passenger car, pickup truck, and Sports Utility Vehicle (SUV) emissions starting with the 2026 model year through 2035 and require an increasing number of zero-emission vehicles to be sold. The regulation relies on advanced vehicle technologies, including battery-electric, hydrogen fuel cell electric and plug-in hybrid-electric vehicles, to meet air quality and climate change emissions standards. To date, 17 states have adopted all or part of California's low-emission and zero-emission vehicle regulations, as allowed under Section 177 of the Federal Clean Air Act,¹⁷ and others may follow.

California New Light-Duty Zero-Emission Vehicle Market

A total of 441,283 new light-duty ZEVs were sold in California in 2023, a 38% increase from 2021.¹⁸ An additional 227,009 new light-duty ZEVs were sold in the first half of 2024, maintaining a strong pace in sales.¹⁹ ZEV market share in California was at 24.9% through the first half of 2024, maintaining a market share percentage similar to numbers seen at the end of 2023.²⁰

¹⁵ California Air Resources Board. California moves to accelerate to 100% new zero-emission vehicle sales by 2035. August 25, 2022. <https://ww2.arb.ca.gov/news/california-moves-accelerate-100-new-zero-emission-vehicle-sales-2035>

¹⁶ Exhaust Emissions Standards and Test Procedures – 2026 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, Cal. Code Regs., tit. 13, § 1961.4.

¹⁷ California Air Resources Board. *States that have Adopted California's Vehicle Standards under Section 177 of the Federal Clean Air Act*. Published May 13, 2022. <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/states-have-adopted-californias-vehicle-regulations>

¹⁸ California Energy Commission (2024). New ZEV Sales in California. Data last updated August 6, 2024. Retrieved August 16, 2024 <https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/new-ZEV-sales>

¹⁹ Ibid.

²⁰ Ibid

New ZEV sales in California are expected to remain strong throughout 2024. As manufacturers continue to introduce new ZEV models, in part in response to regulatory action like the Advanced Clean Cars program²¹, consumers have an increasing variety of ZEVs to choose from that meet their daily driving needs.²² The additional new ZEV sales from the first half of 2024 now brings the total number of ZEVs sold in California since 2011 to nearly 2 million.²³ Based on current trends, new car sales in California are slightly lower than they were in 2023; however, the State is still forecasted to have 1.8 million new vehicles sold by the end of 2024.²⁴ This suggests that California has exceeded the 1.5 million vehicle goal ahead of the 2025 deadline. The Advanced Clean Cars II Regulation supports this goal with requirements for an increasing number of ZEVs to be sold beginning in the 2026 and by requiring 100% new ZEVs sales by 2035.

California has the largest new ZEV market in the United States with nearly 2 million cumulative light-duty ZEVs sold through June 2024. Over 227,000 new light-duty ZEVs were sold in the first half of 2024, maintaining strong ZEV sales. New light-duty ZEV market share now stands at about 24.9% of all new light-duty vehicles sold.

California Used Light-Duty Zero-Emission Vehicle Market

As California's new ZEV market continues to grow, so does California's used ZEV market. In June 2023, the used ZEV inventory in the United States hovered between 31,000 and 32,000 vehicles, more than double the number in 2022.²⁵ California has the largest share of this inventory of used ZEVs with a total monthly average of about 7,000 used light-duty ZEVs as of April 2022.²⁶ It is important to note that this number is representative of the used inventory available at a snapshot in time.

After years of high demand and low inventories pushed used ZEV prices to record highs, prices decreased 28% year-over-year in the third quarter of 2023 and reached

²¹ California Air Resources Board. California moves to accelerate to 100% new zero-emission vehicle sales by 2035. August 25, 2022. <https://ww2.arb.ca.gov/news/california-moves-accelerate-100-new-zero-emission-vehicle-sales-2035>

²² Charged Fleet. *Interest in ZEVs and Hybrids Spikes as Fuel Prices Soar*. March 29, 2022. <https://www.chargedfleet.com/10164307/interest-in-evs-and-hybrids-spike-as-fuel-prices-soar>

²³ California New Car Dealers Association. *California Auto Outlook: 2024 Q2*. Volume 20, Number 3. Released July 2024. Accessed on August 16, 2024. <https://www.cncda.org/wp-content/uploads/Cal-Covering-2Q-24.pdf>

²⁴ Ibid

²⁵ Najman, Liz. Recurrent Automotive. *California Electric Vehicle Trends*. <https://www.recurrentauto.com/research/california-electric-vehicles>

²⁶ Ibid

levels not seen since April 2021.²⁷ Based on Recurrent Automotive's April 2023 analysis of California's used ZEV market, about half of used ZEVs fall under \$30,000, but the influx of expensive used ZEVs on the market pushes the average used ZEV price to about \$34,480.²⁸ This is in comparison to the average price of a used internal combustion engine vehicle which was about \$24,500 in early 2023.

The recently approved Advanced Clean Cars II Regulation contains a number of ZEV

California has the largest used ZEV inventory in the United States and half of all used models fall under \$30,000.

assurance measures, such as minimum warranty and durability requirements, and increased serviceability which ensures consumers can replace their gas-powered vehicles with new or used zero-emission vehicles that meet their needs for transportation and protect the emission benefits of the program.²⁹ The regulation also offers automakers additional flexibilities for

actions to improve access to ZEVs in disadvantaged and low-income communities, such as providing reduced price ZEVs for community mobility programs, producing affordable ZEVs, and retaining used vehicles in California to support the State's complimentary policies and incentives.³⁰

CARB received funding for FY 2022-23 to develop and implement the statewide Zero-Emission Assurance Project, which will help lower-income Californians reduce the risk of buying a used ZEV by providing a rebate or vehicle service contract for the replacement battery or fuel cell component, if needed. As these are newer efforts, staff will continue to analyze their impacts on the used ZEV market in California as part of this Long-Term Plan effort for light-duty ZEVs and provide updates in future iterations of the plan.

The used ZEV market in California is equally important as the new ZEV market as it makes ZEV technology accessible at lower price points, which tend to be more affordable to lower- and middle-income households. It will be important to increase incentive support for the used ZEV market over the coming years to foster the widespread adoption of the technology needed to meet California's various climate and air quality goals.

²⁷ Recurrent Automotive. *Used Electric Car Prices & Market Report - Q2 2023*. <https://www.recurrentauto.com/research/used-electric-vehicle-buying-report>

²⁸ Ibid.

²⁹ California Air Resources Board. *Advanced Clean Cars II*. <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii>

³⁰ Ibid.

Light-Duty Zero-Emission Vehicle Technology Assessment Update

Battery price is the major cost component in ZEV manufacturing. Monitoring the battery cost production and close analysis of cost reduction is critical for market projection. This section discusses current and future battery costs and its impact on ZEV market acceleration, based on public information that is currently available. As with all other components of this plan, staff expects to have updated information in next year's plan that considers updates to the current regulatory and incentive landscape.

Battery/Battery Pack System Cost and Projections

Recent findings show that battery costs declined to record lows in 2023 with prices at \$139 per kilowatt hour (kWh); this represents a nearly 14% decrease from 2022 and 82% lower than in 2013.³¹ Continued research, improved supply chain, and improvements to manufacturing should continue to reduce battery costs over the next ten years.³²

The price of automotive battery packs was around \$139 per kWh by the end of 2023– an 82% decline from 2013.

BloombergNEF's 2023 Battery Price Survey credits this decrease in prices to the falling costs of materials as well as increased production. During the second half of 2022, lithium, cobalt, and nickel prices were moderated. Based on their analysis, BloombergNEF expects battery prices to continue decreasing in 2025, when lithium prices are expected to ease as more extraction and refining capacity comes online. Based on the updated observed learning rate, BloombergNEF's 2022 Battery Price Survey predicts that average pack prices should fall to \$113/kWh in 2025 and drop to \$80/kWh by 2030.³³

Zero-Emission Vehicle Infrastructure Update

An extremely important component of a successful and sustainable ZEV market is the availability of charging and fueling infrastructure to support the number of ZEVs on the road needed to meet California's air quality and climate goals. Access to charging and hydrogen fueling is continually cited by consumers as one of the top barriers to ZEV adoption. As such, continued support of a growing charging and fueling infrastructure network is critical to achieve widespread ZEV adoption. Executive Order B-48-18 set a goal of placing 5 million ZEVs on California's roads by 2030 and

³¹ *Lithium-Ion Battery Pack Prices Hit Record Low of \$139/kWh*. (2023, November 26). BloombergNEF. Retrieved August 18, 2024, from <https://about.bnef.com/blog/lithium-ion-battery-pack-prices-hit-record-low-of-139-kwh/>

³² Ibid.

³³ Ibid.

called for the installation of 200 hydrogen fueling stations and 250,000 ZEV chargers, including 10,000 direct current (DC) fast chargers, by 2025.³⁴

The California Energy Commission (CEC) is the lead agency for overseeing investments and tracking progress of ZEV charging and fueling infrastructure, and CARB staff work very closely with CEC in support of widespread ZEV adoption in California. Assembly Bill (AB) 2127 (Ting, Chapter 365, Statutes of 2018) requires CEC to prepare a statewide assessment of the charging and fueling infrastructure needed to achieve the goal of 5 million ZEVs on the road by 2030 and reduce emissions of greenhouse gases to 40% below 1990 levels by 2030. Executive Order N-79-20 directed the CEC to expand this assessment to support 100% ZEV sales for new passenger vehicles, 100% ZEV operations for drayage trucks, and 100% ZEV operations for off-road vehicles and equipment by 2035.

As of January 2023, there are over 152,000 public and shared private electric vehicle chargers in California which includes over 14,700 DC fast chargers.

In CEC's second assessment, AB 2127 Electric Vehicle Charging Infrastructure Assessment Analyzing Charging Needs to Support ZEVs in 2030 and 2035, the analysis estimates that more than 1 million chargers are needed to support 7.1 million electric vehicles in 2030 and over 2.1 million public and shared private chargers are needed to support 15.2 million ZEVs in 2035.³⁵ As of August 2024, there are more than 152,000 public and shared private electric vehicle chargers in California which includes more than 14,700 DC fast chargers.³⁶ A total of 54 light-duty hydrogen refueling stations are open with 28 additional stations planned.³⁷ CEC's recent assessment also indicates that an additional 167,000 chargers are planned through various State grants, settlement agreements, and approved electric utility investments meaning that the State is on track to meet the 2025 goal of 250,000 public and

³⁴ Executive Order B-48-18, <https://www.library.ca.gov/wp-content/uploads/GovernmentPublications/executive-order-proclamation/39-B-48-18.pdf>

³⁵ California Energy Commission (2024). Assembly Bill 2127 Electric Vehicle Charging Infrastructure Assessment Analyzing Charging Needs to Support ZEVs in 2030 and 2035. Published March 6, 2024. <https://www.energy.ca.gov/publications/2024/assembly-bill-2127-second-electric-vehicle-charging-infrastructure-assessment>

³⁶ California Energy Commission (2024). Electric Vehicle Chargers in California. Data last updated August 26, 2024. Retrieved August 28, 2024. <https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/electric-vehicle>

³⁷ California Energy Commission (2024). Hydrogen Refueling Stations in California. Data last updated June 30, 2024. Retrieved August 16, 2024. <https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics-collection/hydrogen>

shared chargers.³⁸ In order to support 8 million ZEVs in 2030, CEC's analysis indicates that more than 700,000 shared private and public chargers are needed outside of what is already installed or planned.³⁹

As California has a critical and immediate need to increase charging infrastructure across the State, continued and significant public investment in addition to policies that encourage increased private investment will be necessary to help reach these goals. CARB staff will continue working closely with CEC to monitor deployment of charging infrastructure and provide updates in future iterations of this appendix as it relates to widespread ZEV adoption in California.

Trajectory Analysis to 2030

The ZEV sales trajectory established by the Center for Sustainable Energy's (CSE) Caret® Electric Vehicle Planner (Caret®-EV) simulation is calculated to 2030 to help estimate progress toward State ZEV deployment goals, as required by the Supplemental Report to the FY 2018-19 Budget Act.⁴⁰ The State of California's ZEV deployment goals are:

- 1 million vehicles deployed by 2023
- 1.5 million vehicles deployed by 2025
- 5 million vehicles deployed by 2030

Recent vehicle registration data⁴¹ indicate that cumulative ZEV sales have surpassed the 2023 and 2025 ZEV deployment goals that were established in Executive Order B-48-18.⁴² In Figure C-1, the solid black line that begins in 2010 and continues through May 2024 shows the historical cumulative growth of ZEV sales, while the continuation along the dashed green line is the Caret®-EV forecast from June 2024 through the beginning of 2030. The dashed and labeled markers in Figure C-1 mark the three State ZEV sales goals. As indicated by ZEV sales data reported on the Energy Commission's dashboard, the goal of 1 million vehicles by 2023 was met at the end of 2021, while the subsequent goal of 1.5 million vehicles by 2025 was met in

³⁸ California Energy Commission (2024). Electric Vehicle Chargers in California. Data last updated August 26, 2024. Retrieved August 28, 2024. <https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/electric-vehicle>

³⁹ Ibid.

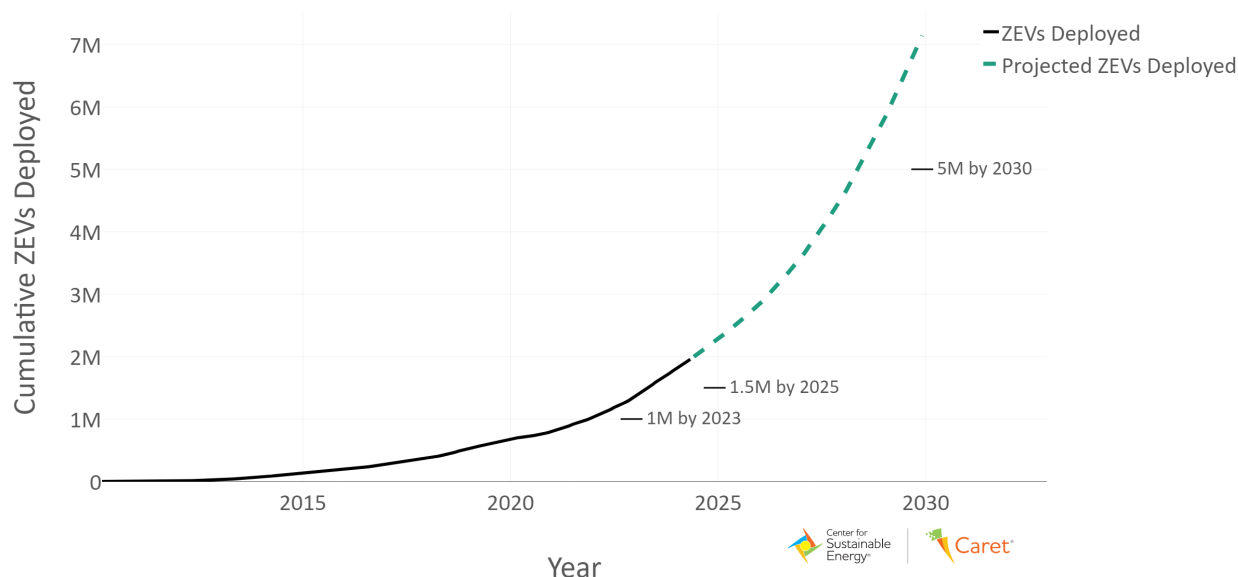
⁴⁰ Legislative Analyst's Office. (2018). *Supplemental report of the 2018-19 budget act* (Publication No. 3883). Retrieved from <https://lao.ca.gov/reports/2018/3883/supplemental-language-2018.pdf>

⁴¹ S&P Global Mobility. Light vehicle registrations in California, 2010-2023 [Data set].

⁴² Office of the Governor of California. (2018). *Executive Order B-48-18*. Retrieved from <https://www.library.ca.gov/wp-content/uploads/GovernmentPublications/executive-order-proclamation/39-B-48-18.pdf>

2023.⁴³ The final goal of 5 million vehicles is projected to be met toward the middle of 2028 as shown in Figure C-1. These projections show trends similar to those provided in the Initial Statement of Reasons for the Advanced Clean Cars II Regulation. That analysis projected cumulative ZEV and plug-in hybrid electric vehicle (PHEV) sales to be 1.9 million in 2025, to exceed 5 million in 2029, and to reach 6.8 million in 2030.

Figure C-1: Trajectory Toward Zero-Emission Vehicle Deployment Goals (Cumulative Sales)



This sales forecast includes estimated effects of the federal ZEV tax credits provided by the Inflation Reduction Act, the Advanced Clean Cars II Regulation, the regional Clean Cars 4 All (CC4A) programs, and the upcoming statewide Drive Clean Assistance Program. Notably, CVRP is absent from the forecast, as the program closed in the final months of 2023. As this is a forecast, it is an illustration of what could happen in the coming years but actual ZEV deployment numbers could vary from what is depicted in Figure C-1.

⁴³ California Energy Commission (2024). New ZEV Sales in California. Data last updated August 6, 2024. Retrieved August 16, 2024 <https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/new-ZEV-sales>

ZEV Market Share Trajectory

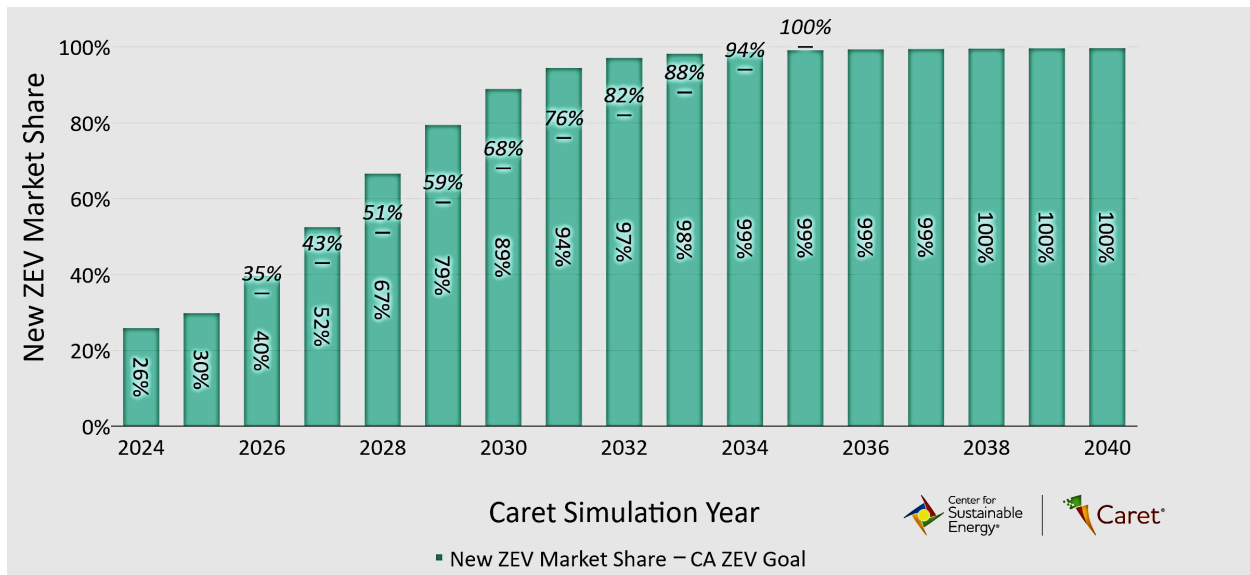
The Advanced Clean Cars II Regulation requires annual ZEV new vehicle market share targets between 2026 and 2035.⁴⁴ In 2026, 35% of new vehicle sales must be ZEVs.⁴⁵ Starting in model year 2026, the market share requirement increases annually to 100% by 2035. The ZEV market share trajectory forecasted by Caret®-EV, which incorporates estimated effects of the regulation, in Figure C-2 indicates California ZEV market share (green bars) will surpass regulatory goals (dashed markers) in all years leading up to the 100% in 2035 goal. In 2024, ZEV sales were expected to make up 26% of new vehicle sales in the State, which would be a relatively small increase from the 25% ZEV market share achieved in California in 2023.⁴⁶ As the ZEV market matures in 2025, larger market share growth was projected. The ZEV regulatory goals were projected to be exceeded each year beginning in 2026, when 40% ZEV market share was projected, and the regulatory goal was 35%. The projected ZEV market share continued to exceed regulatory goals through 2034, when 99% ZEV market share was projected, and the regulatory goal was 94%. In 2035 the ZEV regulatory market share goal is 100%, while projected ZEV market share remained at 99% due to a small proportion of consumers who will continue to buy internal combustion engine vehicles based on personal preferences.

⁴⁴ California Air Resources Board. (n.d.). *Advanced Clean Cars II*. Retrieved August 8, 2024, from <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii>

⁴⁵ Exhaust Emissions Standards and Test Procedures – 2026 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, Cal. Code Regs., tit. 13, § 1961.4.

⁴⁶ California Air Resources Board. (April 24, 2024). *Snapshot: Zero-emission vehicle market trends*. Retrieved August 8, 2024, from <https://ww2.arb.ca.gov/resources/fact-sheets/snapshot-zero-emission-vehicle-market-trends>

Figure C-2: Trajectory Toward Zero-Emission Vehicle Market Share Goals



The early years of the forecast illustrate the momentum that ZEV sales will experience as ZEV supply chains mature, resulting in more cost-competitive ZEVs relative to internal combustion engine alternatives and increased consumer demand for ZEVs due to the maturation of the sociotechnical factors influencing consumer choices (e.g., ZEVs become more of the norm for vehicle purchases). ZEV market share starting in 2035 and beyond conveys a gradual approach toward 100% ZEV new vehicle sales that is characteristic of the technological diffusion process the market is likely to follow. The gradual increase between 99% and 100% ZEV market share is due to an assumed small proportion of individuals who will strongly prefer specific internal combustion engine vehicles and would be willing to pay a premium to have them.

The ZEV market share projection was modeled considering several incentive policies, which represent influential external factors that may be subject to change over time. The projections assumed the uninterrupted availability of the federal tax credit for ZEVs through 2032 as well as steadily increasing capacity of automakers to meet its requirements in future years, the implementation of Advanced Clean Cars II starting in 2026, and the ongoing availability of CARB's light-duty vehicle purchase incentive programs at their current incentive levels. Deviations from the current understanding of these policies would result in changes to ZEV market share in future years.

A Sustainable Light-Duty Zero-Emission Vehicle Market

To address the SB 1275 requirement of assessing when a self-sustaining market is expected, CARB staff, in consultation with academia and stakeholders, decided to use the Diffusion of Innovation Theory as the framework for this analysis when it did the first Long-Term Plan for CVRP and the ZEV market as part of the FY 2016-17

Funding Plan. Based on this approach, staff defined the self-sustainable ZEV market as a state of the market where broad incentives are not required to increase ZEV adoption. A self-sustaining market is expected once the California new ZEV market share reaches 16% to 20%, the market has reached the early majority segment, cost parity with comparable internal combustion engine vehicles, and there is enough demand and vehicle choice diversity to help market mechanisms take over and drive the market. The detailed description of the theory and staff's original work to establish this metric to define a sustainable ZEV market can be found in Part II of the FY 2016-17 Funding Plan.⁴⁷

In developing the FY 2022-23 update to the Long-Term Plan, staff asked stakeholders if it should consider alternative approaches to defining a sustainable ZEV market.⁴⁸ There was no alternative offered, and staff has not identified a better approach than the current one; hence, staff will continue using the metric of 16% to 20% ZEV market share based on the Diffusion of Innovation Theory as the indicator of a sustainable ZEV market. Staff recognizes, however, that this theory is predicated on a free market, whereby the technologies originally included in the theory's development were not regulated in the same way that vehicles are regulated in California. Regardless, this theory serves as a reasonable guide given the nature of the vehicle market.

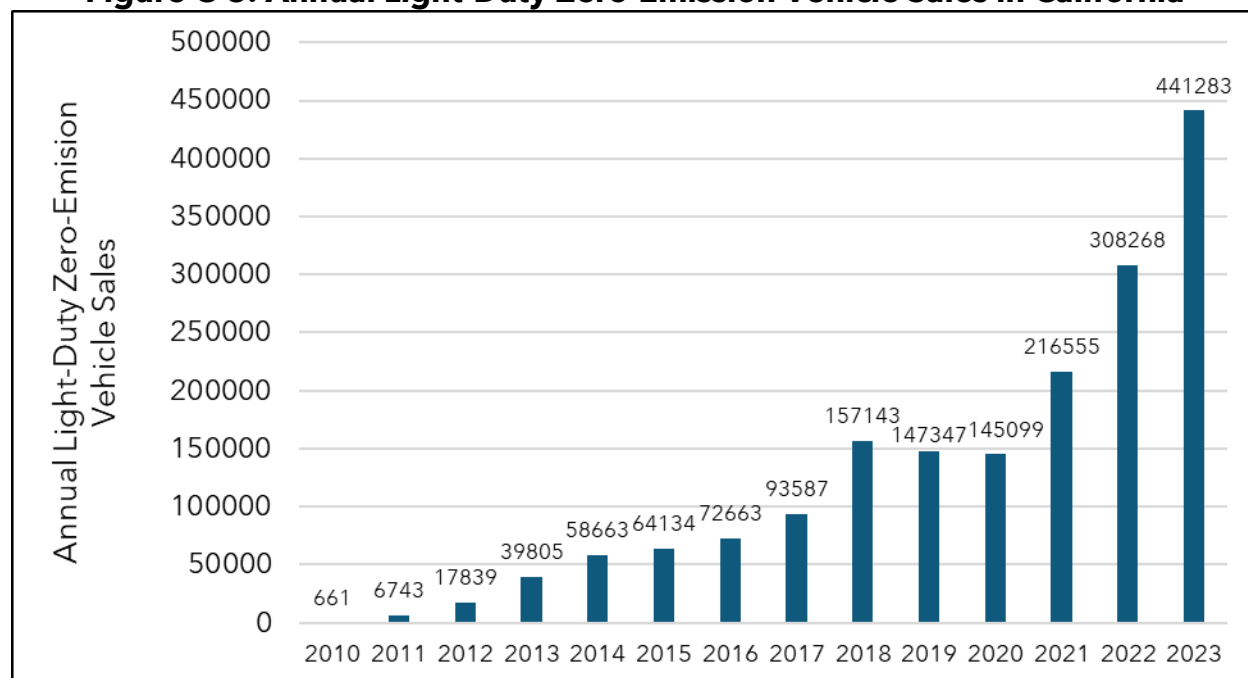
In the 2016-17 Funding Plan, staff identified metrics that can be used to track progress toward market sustainability. The most outstanding one was ZEV market share and staff chose this metric to define the sustainable market. Other indicators evaluated include annual ZEV sales numbers, diversity in available models, and consumer awareness. Progress on these metrics is described below. Staff also identified several technology-based metrics such as battery and vehicle cost as indicators of progress, which were described earlier in this Long-Term Plan in the ZEV Market and Technology Assessment section. Finally, staff also evaluated the importance and impact of the federal policies, including the federal tax credit, in the next section. This was done since federal policies may ultimately have a significant impact on the growth of the ZEV market toward sustainability, and it is one of the elements CARB is required to evaluate per the Supplemental Report of the 2018-19 Budget Act. Annual New Light-Duty ZEV Sales and Market Share.

⁴⁷ California Air Resources Board. *Proposed Fiscal Year 2016-17 Funding Plan For Low Carbon Transportation And Fuels Investments And The Air Quality Improvement Program*. May 2016. https://ww2.arb.ca.gov/sites/default/files/classic/msprog/aqip/fundplan/proposed_fy16-17_fundingplan_full.pdf

⁴⁸ First Public Workshop on the Fiscal Year 2022-23 Update to the Three-Year Plan for Light-Duty Vehicles and Clean Transportation Investments. February 10, 2022. Workshop materials and Zoom meeting recording found on the CARB website: <https://ww2.arb.ca.gov/our-work/programs/low-carbon-transportation-investments-and-air-quality-improvement-program/low-0>.

Staff considers annual new ZEV sales in California as an indicator of market growth and over the last few years closely monitored and analyzed the trend. California annual ZEV sales have grown continuously over the last three years even though general light-duty vehicle sales have been declining since 2016. New ZEV sales remained strong through 2023 and into the first half of 2024. Figure C-3 illustrates the growth in new light-duty ZEV sales through 2023. Figure C-4 illustrates ZEV market growth in California from 2011 through the second quarter of 2024. Table C-1 shows details of new ZEVs sold over the last five years and California ZEV market share held steady at around 8% of the new light-duty vehicle sales in 2020 and surged ahead to over 25% market share in 2023. The California ZEV market share is expected to increase as the new light-duty market continues to rebound in 2024 and beyond.

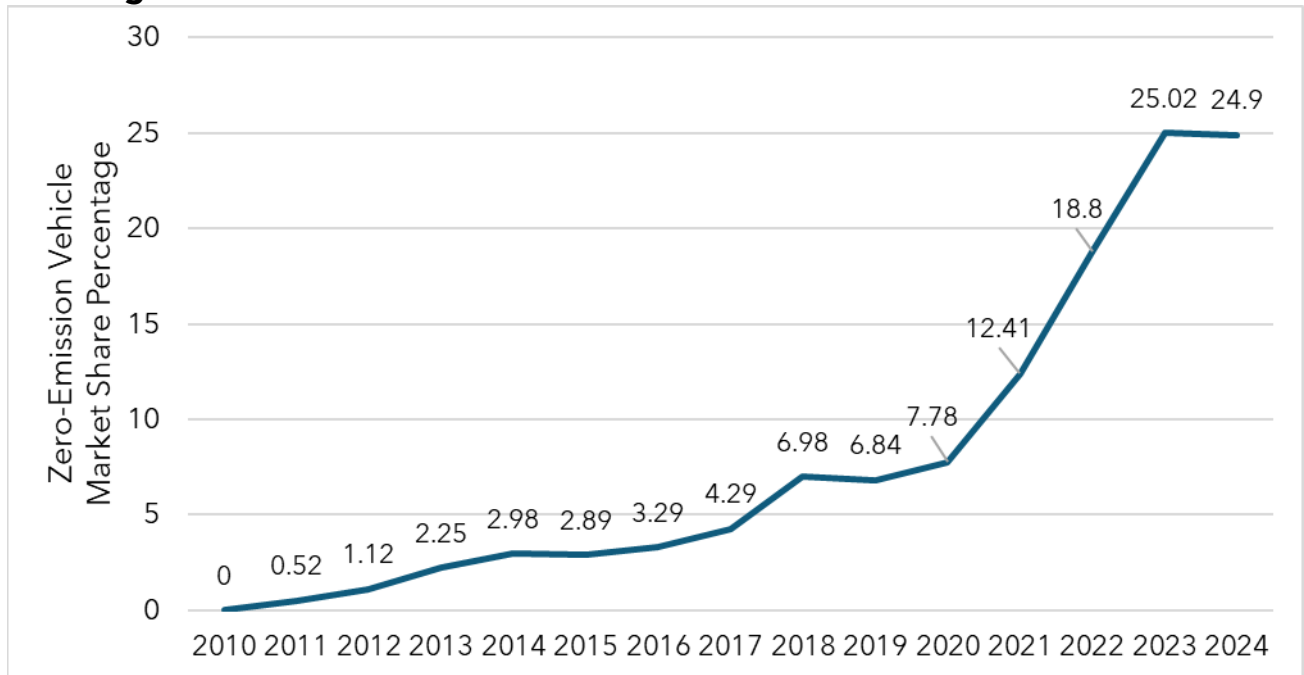
Figure C-3: Annual Light-Duty Zero-Emission Vehicle Sales in California



Data Source: California Energy Commission ZEV Sales Dashboard. Data through 2023.⁴⁹

⁴⁹ California Energy Commission (2024). New ZEV Sales in California. Data last updated August 6, 2024. Retrieved August 16, 2024, from <https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/new-ZEV-sales>

Figure C-4: California Zero-Emission Vehicle Market Share Over Time



Data Source: California Energy Commission ZEV Sales Dashboard. Data through Quarter 2 2024.⁵⁰

⁵⁰ Ibid.

Table C-1: Hybrid and Zero-Emission Vehicle New Vehicle Registrations and Market Share⁵¹

Metric	2020	2021	2022	2023	Year to Date 2024
Plug-In Hybrid-Electric Vehicle registration	38,153	63,141	50,748	63,496	33,692
Plug-In Hybrid-Electric Vehicle share	2.05%	3.13%	2.80%	3.60%	3.70%
Zero-Emission Vehicle registration**	106,946	187,138	292,496	377,787	193,317
Zero-Emission Vehicle share	5.73%	9.28%	13.67%	21.42%	21.22%
Total # of Plug-In Hybrid-Electric Vehicle & Zero-Emission Vehicles Sold	145,099	250,279	345,818	441,283	227,009
Total # of Light Duty Vehicles Sold	1,864,164	2,016,192	1,835,429	1,764,063	910,978
Total Plug-In Electric Vehicle Market Share	7.78%	12.41%	18.84%	25.02%	24.90%
Year-to-Year Growth Rate	-1.53%	72.49%	38.17%	27.61%	TBD

Data Source: California Energy Commission Zero Emission Vehicle and Infrastructure Statistics⁵²

*Data through June 2024

**Includes BEV and fuel cell electric vehicle registration data

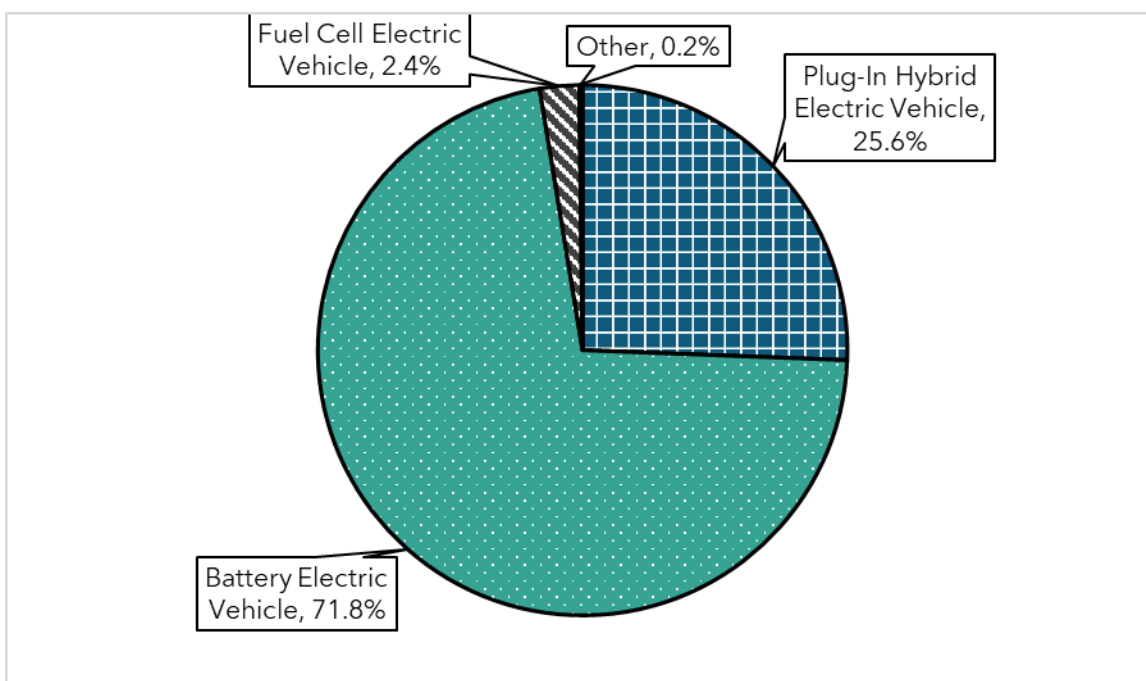
⁵¹ Ibid.

⁵² Ibid

New plug-in electric vehicle registrations in 2023 reached 441,283, which is a nearly 28% increase from 2022. Since remaining steady through 2020, the ZEV market began to surge in 2021 and has continued to do so throughout the first half of 2024. This is likely due to increasing supply, the growing number of ZEV models, continued expansion of California's charging network, and the State and federal government's commitment to strong ZEV incentives. As the Advanced Clean Cars II requires vehicle manufacturers to increase ZEV production beginning with Model Year 2026, and more ZEV models are introduced in varying vehicle classes, it is likely that their market share will continue to increase.

In recent years, the same technology split trend under CVRP has been observed and as Figure C-5 shows, CVRP recipients chose battery electric vehicles (BEV) at about twice the rate of PHEVs. This indicates that with more variety of higher-range BEVs with higher incentive amounts available, consumers are more interested in choosing cleaner technologies.

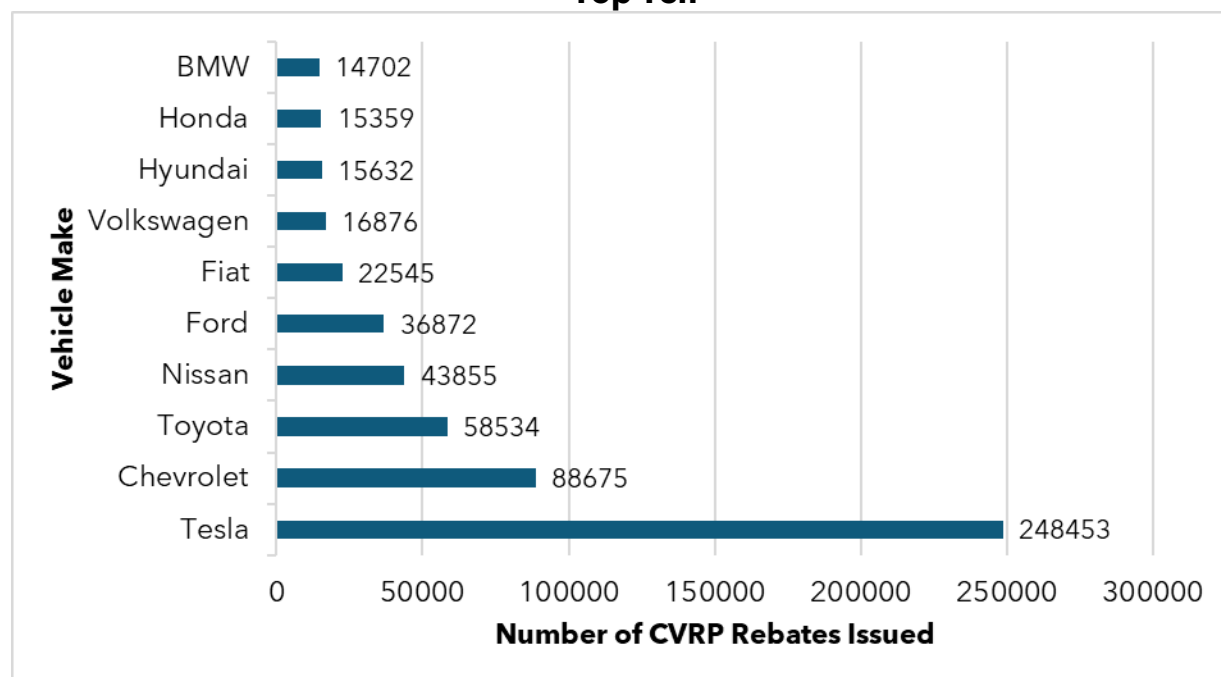
Figure C-5: Clean Vehicle Rebate Project Cumulative Rebates by Technology Type (From March 2010 through December 2023)



Tesla, Chevrolet, Toyota, Nissan, and Ford are the top five manufacturers whose vehicles have received rebates under CVRP. Figure C-6 illustrates the number of

rebates received under CVRP by the top ten vehicle makes since the inception of the program in March 2010 through December 2023.

Figure C-6: Cumulative Clean Vehicle Rebate Project Rebates by Vehicle Make - Top Ten



In summary, ZEV sales managed to maintain a market share of about 8% of new car sales in California through the end of 2020, surged to over 25% by the end of 2023, and maintained a market share of nearly 25% through the first half of 2024. In total, nearly 2 million ZEVs have been sold in California through Q2 of 2024 - exceeding the goal of 1.5 million ZEVs deployed by 2025.⁵³ While recent ZEV market share percentages have surpassed staff's defined indicator of a sustainable ZEV market of 16% to 20% market share, it is important to continue investment in these vehicles as they are still at a price point that is out of reach for many consumers, particularly those with lower incomes and living in disadvantaged communities.

Vehicle Choice Diversity

Consumers have different needs and expectations, especially when it comes to vehicles. Vehicle choice and model availability across market segments is a critical decision-making factor for new car shoppers and a diverse selection of makes and

⁵³ California Energy Commission (2024). New ZEV Sales in California. Data last updated August 6, 2023. Retrieved August 16, 2024, from <https://www.energy.ca.gov/EVstats>

models is an indicator for market growth. Through Q2 of 2024, SUVs, pickup trucks, and vans accounted for about 72% of new vehicle sales in California while small,

For Model Year 2023, 110 different models of electric-drive vehicles across various EPA vehicle classes are available in the U.S. market, and 59 of them are eligible for CARB purchase incentives.

mid-size, and large cars accounted for the remaining 28%.⁵⁴ For model year 2023, 110 different models of electric-drive vehicles across various U.S. EPA vehicle classes are available in the California market⁵⁵, and 59 of them are eligible for CARB purchase incentives.

As noted, vehicle diversity is an indicator of the health of the ZEV market, which is supported by research. For example, a recent publication by the International Council on Clean Transportation shows that cities with

more models available to consumers had higher numbers of ZEV registrations.⁵⁶ Advancements in technology have created ZEV options with much longer ranges (upwards of 300+ miles on a full charge), towing capacity, and larger vehicle options such as SUVs, minivans, and trucks.

As several electric pickup trucks and SUVs are expected to hit the U.S. market in the coming years, it is important that eligibility requirements for incentive programs are crafted in a way that supports these emerging larger vehicle categories. Dividing eligibility requirements for smaller vs. larger plug-in hybrid and battery-electric vehicles is one way to do so. As larger plug-in hybrid and battery-electric vehicles come to the market, staff recognizes that these vehicles may have a higher manufacturer suggested retail price, known as MSRP, with ranges that may be shorter than smaller vehicle classes that have been part of the ZEV market for some time. This change could help CARB light-duty vehicle purchase incentive programs continue to be supportive of ZEV deployment across the various vehicle classes in the light-duty market while prioritizing funding for the cleanest vehicles.

Table C-2 lists each of the models available by vehicle technology type in the California market.

⁵⁴ California New Car Dealers Association, *California Auto Outlook: Q2 2024*, Volume 20, Number 3, Released July 2024. Retrieved August 16, 2024, from <https://www.cncda.org/wp-content/uploads/Cal-Covering-2Q-24.pdf>

⁵⁵ Veloz. *California EV Market Report - Q2 2024 Update*. <https://www.veloz.org/ev-market-report/>

⁵⁶ The surge of electric vehicles in United States cities. (2019). In *The International Council on Clean Transportation*. https://theicct.org/sites/default/files/publications/ICCT_EV_surge_US_cities_20190610.pdf

Table C-2: Electric-Drive Vehicles Available by Manufacturer, Model Year 2023-24

Make	Models	Type of Vehicle
Audi	2023 and 2024 Audi e-tron GT	BEV
Audi	2023 and 2024 Audi e-tron quattro	BEV
Audi	2023 and 2024 Audi e-tron Sportback	BEV
Bentley	2023 and 2024 Bentley Flying Spur Hybrid	PHEV
BMW	2023 and 2024 BMW 330e	PHEV
BMW	2023 and 2024 BMW i4	BEV
BMW	2023 and 2024 BMW i7	BEV
BMW	2023 and 2024 BMW iX	BEV
BMW	2023 and 2024 BMW XM	PHEV
Cadillac	2023 and 2024 Cadillac LYRIQ	BEV
Chrysler	2023 and 2024 Chrysler Pacifica Hybrid	PHEV
Ferrari	2023 and 2024 Ferrari Spider	PHEV
Ferrari	2023 and 2024 Ferrari Stradale	PHEV
Ford	2023 and 2024 Ford F-150 Lightning	BEV
Ford	2023 and 2024 Ford Mustang Mach-E	BEV
Genesis	2023 and 2024 Genesis Advance	BEV
Hyundai	2023 and 2024 Hyundai Ioniq	BEV
Hyundai	2023 and 2024 Hyundai Kona Electric	BEV
Hyundai	2023 Hyundai Nexo	FCEV
Hyundai	2023 and 2024 Hyundai Tucson	PHEV
Jaguar	2023 and 2024 Jaguar I-Pace EV400	BEV
Jeep	2023 and 2024 Jeep Grand Cherokee	PHEV
Jeep	2023 and 2024 Jeep Wrangler	PHEV
Kia	2023 and 2024 Kia EV6	BEV
Kia	2023 and 2024 Kia Niro Electric	BEV
Kia	2023 and 2024 Kia Sorento Plug-in Hybrid	PHEV

Make	Models	Type of Vehicle
Kia	2023 and 2024 Kia Sportage Plug-in Hybrid	PHEV
Lexus	2023 and 2024 Lexus RZ	BEV
Lucid	2023 and 2024 Lucid Air Pure	BEV
Mercedes-Benz	2023 and 2024 Mercedes-Benz EQS	BEV
Mercedes-Benz	2023 and 2024 Mercedes-Benz EQS SUV	BEV
Mitsubishi	2023 and 2024 Mitsubishi Outlander PHEV	PHEV
Nissan	2023 and 2024 Nissan ARIYA	BEV
Nissan	2023 and 2024 Nissan LEAF	BEV
Polestar	2023 and 2024 Polestar 2	BEV
Porsche	2023 and 2024 Porsche Taycan	BEV
Rivian	2023 and 2024 Rivian R1S	BEV
Rivian	2023 and 2024 Rivian R1T	BEV
Subaru	2023 and 2024 Subaru Solterra	BEV
Tesla	2023 and 2024 Tesla Model S	BEV
Tesla	2023 and 2024 Tesla Model X	BEV
Tesla	2023 and 2024 Tesla Model Y	BEV
Toyota	2023 Toyota Mirai	FCEV
Toyota	2023 and 2024 Toyota bZ4X	BEV
Toyota	2023 and 2024 Toyota Prius Prime	PHEV
Toyota	2023 and 2024 Toyota RAV4 Prime	PHEV
VinFast	2023 and 2024 VinFast VF	BEV
Volkswagen	2023 and 2024 Volkswagen ID.4	BEV
Volvo	2023 and 2024 Volvo Recharge	PHEV
Volvo	2023 and 2024 Volvo C40 Recharge	BEV
Volvo	2023 and 2024 Volvo XC40 Recharge	BEV
Audi	2023 Audi Q5 TFSI e quattro	PHEV
Bentley	2023 Bentley Bentayga Hybrid	PHEV
BMW	2023 BMW 530e	PHEV
BMW	2023 BMW X5 xDrive45e	PHEV
Chevrolet	2023 Chevrolet Bolt EV	BEV
Fisker	2023 Fisker Ocean Extreme One	BEV

Make	Models	Type of Vehicle
Ford	2023 Ford Escape PHEV	PHEV
Hyundai	2023 Hyundai Santa Fe	PHEV
Kia	2023 Kia Niro Plug-in Hybrid	PHEV
Land Rover	2023 Land Rover New Range Rover	PHEV
Lexus	2023 Lexus NX	PHEV
Lincoln	2023 Lincoln Aviator	PHEV
Lincoln	2023 Lincoln Corsair	PHEV
Lordstown	2023 Lordstown Endurance	BEV
Mazda	2023 Mazda MX-30	BEV
McLaren Automotive	2023 McLaren Automotive Artura	PHEV
Mercedes-Benz	2023 Mercedes-Benz S580e 4matic	PHEV
MINI	2023 MINI Cooper SE Countryman	PHEV
MINI	2023 MINI Cooper SE Hardtop	BEV
Porsche	2023 Porsche Cayenne e-Hybrid	PHEV
Porsche	2023 Porsche Panamera e-Hybrid	PHEV
Subaru	2023 Subaru Crosstrek Hybrid	PHEV
Acura	2024 Acura ZDX	BEV
Alfa Romeo	2024 Alfa Romeo Tonale	PHEV
Audi	2024 Audi Sportback e-tron quattro	BEV
BMW	2024 BMW i5	BEV
BMW	2024 BMW iX xDrive50	PHEV
Chevrolet	2024 Chevrolet Blazer EV	BEV
Chevrolet	2024 Chevrolet Equinox EV	BEV
Chevrolet	2024 Chevrolet Silverado EV	BEV
Dodge	2024 Dodge Hornet PHEV	PHEV
Fiat	2024 Fiat 500e	BEV
GMC	2024 GMC Hummer EV Pickup	BEV
GMC	2024 GMC Hummer EV SUV	BEV
Honda	2024 Honda Prologue	BEV
Kia	2024 Kia EV9	BEV
Lucid	2024 Lucid Air Sapphire	BEV
Maserati	2024 Maserati GranCabrio Folgore	BEV
Maserati	2024 Maserati Granturismo Folgore	BEV

Make	Models	Type of Vehicle
Mercedes-Benz	2024 Mercedes-Benz EQE	BEV
Mercedes-Benz	2024 Mercedes-Benz AMG EQE SUV	BEV
Mercedes-Benz	2024 Mercedes-Benz EQB	BEV
Rolls-Royce	2024 Rolls-Royce Spectre	BEV

In summary, there were 59 ZEV models eligible for CARB incentive projects in 2023 and 2024, and 110 models and model variants available in the California market. There has been a significant increase in the number of ZEV models over recent years. In 2011, there were about five ZEVs available for sale. By 2020 there were more than 80, more than 100 in 2022, and 110 in 2023. And manufacturers have announced they anticipate additional ZEV introductions over the next several years, specifically in larger vehicle classes.⁵⁷

Consumer Awareness and Assessment of Light-Duty Zero-Emission Vehicle Marketing Efforts by Automobile Manufacturers

The Supplemental Report to the FY 2018-19 Budget Act directs CARB to assess the marketing efforts of ZEV manufacturers. CARB is coordinating with stakeholders including automakers, Alliance for Automotive Innovation (Auto Innovators), California New Car Dealers Association (CNCDA), and Veloz to evaluate current marketing efforts and determine how to enhance these efforts.

CNCDA: CNCDA's Green Vehicle Report is released twice a year and provides comprehensive information on the State's green vehicle market. The report includes a segment watch, including the top 20 best-selling alternative powertrain vehicles; best sellers in market segments including hybrid, plug-in hybrid, electric, and fuel cell vehicles; and market trends by powertrain type and brand shares in alternative powertrain market. In coordination with CNCDA, CVRP hosts webinars to highlight the efforts that dealers are taking to be green leaders.

Veloz: Veloz is a nonprofit organization with members from key sector companies, agencies, and nonprofits that aim to inspire Californians to drive electric. CARB and Center for Sustainable Energy are founding members of Veloz. Veloz engages electric car stakeholders with its summit series, as well as webinars throughout the year designed to share and discuss the latest updates in the electric car industry. In addition to its consumer-facing ZEV website, Electric For All, Veloz also produces

⁵⁷ Bartlett, Jeff and Preston, Ben. Consumer Reports. "Automakers Are Adding Electric Vehicles to Their Lineups. Here's What's Coming." Published June 7, 2022.
<https://www.consumerreports.org/hybrids-evs/why-electric-cars-may-soon-flood-the-us-market-a9006292675/>

statewide public education campaigns to encourage ZEV adoption.⁵⁸ These campaigns raise awareness about ZEVs, bust myths about ZEVs, and provide access to tools that help consumers make their next ZEV purchase.

- The first campaign launched in 2018 and was titled “Opposites Attract.” It featured a series of short videos and memes to communicate directly to target audiences.
- The second campaign, launched in 2019 and titled “Kicking Gas,” starred former California Governor Arnold Schwarzenegger and focused on increased awareness and education of ZEVs. The 2021 campaign, titled “40 Million Reasons to Go Electric,” highlighted the reasons every Californian should go electric with a focus on social, economic, and environmental justice.
- The third Veloz public awareness campaign, titled “Myths Busting Myths,” launched in September 2022 and focused on busting myths surrounding ZEV technology and ZEV ownership.⁵⁹

Auto Innovators: Auto Innovators continues to promote dialogue with industry, federal, and state governments around public policy and incentives, as well as providing analysis around market data. Automakers also help provide the public with more information about ZEVs by educating dealer staff through trainings. CARB light-duty vehicle purchase incentive programs continue to educate and foster relationships with eligible automakers and dealers about available incentives and the clean vehicle market.

Plug In America: Plug In America offers PlugStar, a nationwide dealer training on ZEVs, and online support and tools for consumers, dealers, and electric utilities.⁶⁰ The PlugStar website provides a ZEV buying guide that allows shoppers to compare models, find information on charging, research available incentives, and get connected with PlugStar-trained ZEV dealers. PlugStar also offers in-person and online ZEV training for dealers nationwide that includes topics such as information about vehicle technology, incentives, and electric utility rates. More in-depth training is available to dealers to become PlugStar certified, which provides dealers with a better understanding of ZEVs and improves ZEV sales.⁶¹

CVRP: Prior to the closure of CVRP in 2023, CSE, as the CVRP administrator, undertook extensive outreach and education activities to increase new car purchasers’ awareness of ZEVs. In addition, a dedicated outreach and education team

⁵⁸ Veloz, *Electric For All*. <https://www.electricforall.org>. Accessed on July 23, 2022.

⁵⁹ Electric For All Powered by Veloz, “Myths Busting Myths”. <https://www.electricforall.org/campaign/>. Accessed on July 18, 2023.

⁶⁰ Plug In America, PlugStar ZEV Dealer Training, <https://pluginamerica.org/about-us/evtraining/>

⁶¹ Ibid.

focused on lower-income consumers in disadvantaged communities to ensure these priority populations receive education and information regarding ZEVs and incentives. Since 2014, CSE's outreach and education teams participated in more than 800 events across the State and conducted more than 68,000 ZEV and incentive-related conversations with consumers.

Furthermore, CSE's Dealer Outreach team focused on providing training, tools, and tips to dealers for ZEVs and incentives. During the COVID-19 global pandemic, the Dealer Outreach team transitioned outreach to virtual platforms, including phone calls, emails, virtual information sessions and webinars. While in-person visits were not possible due to the pandemic, the staff made 623 phone calls and sent 19,580 emails to dealership staff from May 2021 to May 2023. Table C-3 shows the dealership outreach in recent years under the CVRP grant (as of July 13, 2023).

In addition to outreach the dealer team hosted three different test drive events in 2022 and 2023:

1. CARB Southern California Headquarters Grand Opening (May 2022), which included five test drive vehicles (Mercedes EQS, Audi e-tron, two Toyota Mirai, and a Toyota RAV4 Prime) and had an estimated attendance of 1,200.
2. National Automobile Dealers Association Auto Show, which included three test drive vehicles (Ford Mustang Mach-E, Chevrolet Bolt, and Toyota Mirai).
3. Pechanga Band of Luiseno Indians Earth Day, which included participation from DCH Kia of Temecula (EV6, Sportage); Temecula Valley Toyota and Temecula Valley Lexus (BZ4X and RZ 450e), and Hyundai (Ioniq 5). The event had an estimated attendance of 250.

Table C-3: California Vehicle Rebate Project Dealer Outreach Team Activities

Dealership Outreach by Year	2017-2015	2018	2019	2020	2021	2022	2023*	Total
In Person Visits	222	990	1,777	339	0	0	1	3,329
Information Sessions	2	48	67	50	23	30	14	234
Materials Distributed	2,769	6,694	12,080	4,738	686	3,746	1,472	32,185

*As of July 13, 2023

Surveys and Other Research: Under the CVRP grant, CSE administered surveys to individual program participants and covers topics such as demographics, housing characteristics, interest in and research on PHEVs, sources of information used, decision-making process, dealership experience, vehicle details, and charging.

Other consumer surveys are being conducted under various research grants and contracts. CARB will coordinate to streamline the survey methodologies and questions to collect similar information across surveys to help inform long-term analyses.

Larger research efforts are also occurring that analyze consumer trends of new vehicle purchasers across the country. J.D. Power created the U.S. Electric Vehicle Consideration (EVC) Study that aims to understand why consumers aren't purchasing ZEVs.⁶² The inaugural U.S. EVC Study was fielded from February through May 2023, with respondents being car shoppers with an intent to purchase or lease a new vehicle in the next 12 months. The third edition of the survey was launched in 2023, and results indicate that 26% of car shoppers are very likely to consider purchasing a new ZEV, up from 24% in 2022.⁶³

Since 2014, the CVRP outreach and education teams have participated in more than 800 events across California and conducted more than 68,000 ZEV and incentive-related conversations with consumers.

California leads the nation in ZEV consideration, with 73% of shoppers saying that they are likely to consider a ZEV. The modest increase is due to positive and negative market factors: higher gas prices, inflation, rising interest rates, greater model availability, and charging availability. One of the key barriers, cited by respondents since the first survey in 2021, is the lack of access to charging at home or work. A finding in the first edition of this survey indicated that consumers who had first-hand experience with ZEVs were more likely to buy a ZEV.⁶⁴ The third edition of the survey also highlights that experience with ZEVs plays an important role in purchase consideration.⁶⁵

Additional key findings from the second edition of the survey include that ZEV consideration is rising fastest with younger generations of consumers as 72% of Gen Y, also known as Millennials, consumers would consider purchasing a ZEV.⁶⁶ The 2022 survey found that ZEV consideration varies by geographic location and that lack

⁶² J.D. Power, *June 15, 2023, Press Release: Battleground for Electric Vehicle Purchase Consideration is Wide Open, J.D. Power Finds*. <https://www.jdpower.com/business/press-releases/2023-us-electric-vehicle-consideration-evc-study>

⁶³ Ibid

⁶⁴ Ibid

⁶⁵ Ibid

⁶⁶ Ibid.

of ZEV education is still a key reason car shoppers do not consider these vehicles.⁶⁷ This implies that to build stronger consumer demand for ZEVs, industry, auto manufacturers, and policy makers need to continue to heavily focus on consumer education and outreach and look for opportunities to increase hands-on experience with ZEVs among consumers. This will be critical over the next 10-15 years as California works to achieve 100% ZEV sales.

Partnering with Community Based Organizations to Increase Awareness and Access to ZEV Incentives

Staff recognizes the value and importance of partnering with local community-based organizations (CBO) and grassroots organizations to increase access to and awareness of ZEVs and various incentives. These CBOs also act as a channel to voice community priorities and provide input on how we can improve our programs, so they are meeting the needs of these communities. There are various efforts underway within CARB's light-duty vehicle purchase incentive programs to expand outreach through CBOs in order to increase participation in these programs by priority populations. And most recently, the Board directed staff, along with the adoption of the Advanced Clean Cars II Regulation, to continue to work with stakeholders to further expand access to ZEVs and zero-emission mobility in the hardest to reach communities in the State. In this section, staff summarizes the current and previous CBO efforts in CVRP, CC4A, Financing Assistance, and Access Clean California (ACCess) and provides insight into any future plans to expand partnerships with CBOs and grassroots organizations.

CVRP: Each year, CVRP continued to increase outreach on ZEVs and available incentives in disadvantaged and low-income communities. This included building a Community Partner Network which was a statewide coalition of CBOs that have a common goal of ensuring clean air for all. CBOs are trusted community members who know community priorities and challenges. The CBOs in CVRP's Community Partner Network provided a wide variety of important services including financial literacy, education, weatherization services, job training, and health advocacy.

CBOs were the foundation of the CVRP Community Partner Network and provide statewide coverage in disadvantaged communities. The CVRP Community Partner Network consisted of the following organizations:

- Central California Asthma Collaborative (seven CBOs throughout Central California)
 - Central California Environmental Justice Network

⁶⁷ J.D. Power. May 26, 2022, Press Release: Electric Vehicle Consideration Up but Skepticism Still Exists, J.D. Power Finds. <https://www.jdpower.com/business/press-releases/2022-us-electric-vehicle-consideration-evc-study>.

- El Pablo Para el Aire y Agua Limpio
- El Quinto Sol de América
- LEAP Institute
- Madera Coalition for Community Justice
- Valley Improvements Projects
- Little Manila Rising
- Environmental Justice Project at Catholic Charities of Diocese of Stockton
- Metropolitan Area Advisory Committee (San Diego County and Imperial County)
- Community Resource Project (Sacramento and Yolo counties)
- Comité Cívico del Valle (Imperial County)
- Pryor Consulting (Sacramento County)

The CVRP Community Partner Network educated community members about CVRP and the benefits of ZEVs through community workshops, test drives, canvassing, art contests, digital marketing, and one-on-one educational assistance. The CBOs informed consumers on how CVRP and other CARB programs can provide incentives to assist in reducing the cost of purchasing a clean vehicle.

In FY 22-23, CVRP focused on expanding outreach to tribal and Black communities. To assist with creating a strategy on how to best provide outreach to Black communities, CVRP partnered with Pryor Consulting, a black-woman-owned business. CVRP also included tribal nations in focus group forums to better understand the concerns and barriers to adopting ZEVs that are specific to tribal communities in order to direct outreach activities. CVRP also expanded the Community Partner Network to include the Community Housing Development Corporation, which provides services in the Richmond/Bay Area, and California Interfaith Power and Light, a statewide organization focusing on Los Angeles, Riverside and San Bernardino counties.

Staff recognizes the importance of ongoing outreach through community-based and grassroots organizations, particularly in priority communities. With CVRP closed, the current Financing Assistance pilots closed, and the new joint statewide CC4A and Financing Assistance Program, known as the Driving Clean Assistance Program (DCAP), launching in September 2024, staff has directed the CVRP administrator to maintain support of the Community Partner Network through FY 2023-24 so there wouldn't be a lapse in outreach. The DCAP administrator, the Community Housing Development Corporation, began outreach in summer 2024 in preparation for the late-summer launch of the program. This ensured that outreach about ZEVs and all available federal, state, and local incentives continued in these communities while staff worked to get the new joint program launched.

CC4A: Participating air districts are using a variety of methods to educate community members about their programs. CBOs play a critical role in conducting outreach to potential applicants and providing information about clean vehicle funding and the associated benefits of ZEVs. CBOs also advise air districts and their program partners with the most effective methods to raise awareness about CC4A, especially in the underserved communities they represent. In-person events, including ZEV ride-and-drives, provide program participants an opportunity to familiarize themselves with ZEV technology. CBOs will continue to be used by air districts, particularly to increase program awareness in geographic areas and with ethnic groups that have not had representative participation in the past. The statewide CC4A program, now called DCAP, will require the identification of and coordination with CBOs throughout the State in order to ensure equitable access and education. CBOs that the CC4A program has partnered and collaborated with include:

- Grid Alternatives (multiple districts)
- Beneficial State Foundation (multiple districts)
- Sacramento Electric Vehicle Association (Sacramento Metropolitan Air Quality Management District, or Sac Metro AQMD)
- Rio Linda-Elverta Community Center and Park (Sac Metro AQMD)
- Midtown Business Association (Sac Metro AQMD)
- Hagginwood Community Center (Sac Metro AQMD)
- Johnston Community Center (Sac Metro AQMD)
- Woodlake Community Center (Sac Metro AQMD)
- Mexican Cultural Center of Northern California (Sac Metro AQMD)
- Oak Park Community Center (Sac Metro AQMD)
- Building Healthy Communities (Sac Metro AQMD)
- Fruitridge Community Center (Sac Metro AQMD)
- South Oak Park Community Association (Sac Metro AQMD)
- Samuel Pannell Meadowview Community Center (Sac Metro AQMD)
- Robertson Community Center (Sac Metro AQMD)
- Foothill Community Center (Sac Metro AQMD)
- Hammond Climate Solutions (San Diego Air Pollution Control District, or San Diego APCD)
- Metropolitan Area Advisory Committee (San Diego APCD)
- Environmental Health Coalition (San Diego APCD)
- Casa Familiar (San Diego APCD)
- Greenlining Institute (San Diego APCD)
- Groundworks (San Diego APCD)
- South Bay Community Services (San Diego APCD)
- Valley Clean Air Now (Valley CAN) (San Joaquin Valley Unified Air Pollution Control District)

Financing Assistance: Financing Assistance for Lower-Income Consumers project (Financing Assistance) was designed to help lower-income Californians purchase advanced clean vehicles by providing electric vehicle purchase price grants, facilitating low-interest loans, and providing charging grants or pre-paid charging cards on a first come, first-served basis. A needs-based model that prioritizes applications based on criteria such as income, disadvantaged community residency, need for financial counseling or planning, and categorical eligibility was adopted for the next iteration of this program—the upcoming Driving Clean Assistance Program. CBOs are going to play a pivotal role in program implementation and success by acting as project liaisons to bring outreach and education to their communities and provide valuable input based on the community’s needs for better program development to the project.

The following is a list of CBOs and partners that the Financing Assistance project has partnered or worked with to provide outreach and education about incentives.

- Central California Asthma Collaborative
- Center for Sustainable Energy
- Foundations for California
- GRID Alternatives
- Rising Sun
- Metropolitan Area Advisory Committee
- Abode Services
- Alameda County Housing Authority
- Anewamerica
- Acterra
- Back on Track Community Services
- Bay Area Community Services
- Bridge Housing
- Center for Human Development
- Clearinghouse Community Development Financial Institution
- Community Financial Resources
- Community Resource Center
- Contra Costa Housing Authority
- Contra Costa Unified School District
- Ecumenical Association for Housing Family Housing
- East Bay Workforce Development
- Ensuring Opportunity
- Fighting Back Partnership
- Fremont Family Resource Center
- Goodwill Industries
- GRIP Greater Richmond Interfaith Program
- Health Right

- Jewish Family Service
- Los Medanos College
- Mission Asset Fund
- Mutual Housing
- Napa Community Corrections Service Center
- Opportunity Junction
- Peninsula Family Service
- Pittsburg Unified School District
- Planned Parenthood
- Richmond Community Foundation
- Richmond Neighborhood Housing Services
- Richmond Workforce Development Board
- Roots Community Health Center
- Rubicon Services
- Sandidge Urban Group Inc.
- Shelter Inc.
- Sparkpoint
- Swords to Plowshares
- The Stride Center
- TransForm
- Treasure Island Homeless Development Initiative
- United Way
- Vallejo City School District
- Volunteers of America
- Watsonville Neighborhood Services
- Richmond Neighborhood Housing Services
- Workforce Development Board of Solano County
- Working Solutions

The upcoming statewide Driving Clean Assistance Program will require the program administrator to include detailed plans for collaboration and partnership with CBOs and grassroots organizations.

ACCess: One of the primary goals of ACCess is to work with local CBOs and similar grassroots organizations to help increase awareness of and streamline access to Clean Transportation Equity projects in priority communities. Through its outreach partner network, ACCess provides funding, training, and other capacity-building resources to CBOs to support outreach and application assistance in their local communities. Having graduated from its pilot phase, ACCess will be expanding its network of outreach partners to fill outreach gaps while prioritizing partnerships with CBOs and similar grassroots organizations across the State. To date, ACCess has leveraged its relationships with existing outreach partners to meet local community leaders, learn about community-level outreach needs and gaps, and discover new

community organizations with which to partner. Through CARB's complementary capacity-building grant projects ACCess is also able to build relationships and formally partner with new grassroots-level organizations who are deeply embedded and trusted in their communities. CARB recognizes this as a particular advantageous pathway to expand its network of outreach partners moving forward. The following is a list of CBOs that ACCess is currently funding or has partnered with in the past, including CBOs funded through larger partnerships like Central California Asthma Collaborative and also through the San Diego Mobility Project (supported by ACCess).

- Central California Asthma Coalition's network of six Central Valley-based CBOs
- Little Manila Rising - San Joaquin County
- Catholic Charities Diocese of Stockton - San Joaquin, Stanislaus, Merced counties
- Valley Improvement Projects - Stanislaus County
- Madera Coalition for Community Justice - Madera County
- Central California Environmental Justice Network (CCEJN) - Fresno, Tulare, and Kern counties
- Latino Environmental Advancement Project (LEAP Institute) - Kings County
- Comité Civico del Valle
- Fresno Metro Black Chamber of Commerce
- Healthy Active Streets
- Latina/o Roundtable
- META Coop
- Peninsula Family Services
- People for Mobility Justice
- South Kern Sol
- Social Justice Learning Institute
- I Am Green
- Project New Village
- Groundwork
- The Urban Collaborative Project
- San Diego Urban Sustainability Coalition
- Sacramento Environmental Justice Coalition
- Youth Action Project
- Redeemer Community Partnership

Historical Consumer Awareness

While acceptance of BEVs and PHEVs has historically been challenged by lack of awareness, a national 2021 survey of adults by Pew Research Center found that 92% have heard at least a little about ZEVs, and 30% had heard a lot about ZEVs.⁶⁸

An early 2022 survey of U.S. adults by Consumer Reports found that 14% would definitely choose a BEV if choosing a new car today, and an additional 22% said they would seriously consider one. Of those who did not indicate they would definitely choose a ZEV, the most commonly noted reasons that would prevent one from choosing a ZEV were “charging logistics, such as where and when I’d be able to charge it” (61%), vehicle range (55%), and vehicle costs (52%). 40% said they were at least somewhat familiar “with the fundamentals of owning an electric-only vehicle.”⁶⁹ An Ipsos Mobility Navigator study finds interest in ZEVs increased over time to 36% in 2021.⁷⁰ Furthermore, a survey of Sacramento, California residents echoes findings that consumers are aware of PHEVs and BEVs but need deeper familiarity to consider purchasing or leasing a vehicle.⁷¹ About half are aware of BEV/PHEV advertising, and about a quarter are aware of education programs.⁷² Several respondents reported that they are aware of state government incentives (54%), federal government incentives (46%), and parking incentives (46%).⁷³ Despite this knowledge, Hardman et al. found that the likelihood of a consumer getting a BEV is more closely correlated with a consumer having sought information themselves or having a conversation with a BEV owner than any other factor. It appears that awareness without the personal means of gaining familiarity with the vehicle is usually not enough to spur purchasing or leasing of a PHEV or BEV. Staff recognizes that a lot has changed in the market since 2020 and is working on updated surveys whose results will be included in future iterations of this appendix.

Hardman et al. conclude that incentives and charging programs are less effective when there are gaps in consumer knowledge and familiarity with BEVs. The authors suggest

⁶⁸ Tyson, A., Kennedy, B., & Funk, C. (2021). Gen Z, Millennials stand out for climate change activism, social media engagement with issue. Pew Research Center. https://www.pewresearch.org/science/wp-content/uploads/sites/16/2021/05/PS_2021.05.26_climate-and-generations_REPORT.pdf

⁶⁹ Consumer Reports Survey Research Department. (2022). Battery electric vehicles and low carbon fuel: A nationally representative multi-mode survey. Consumer Reports. https://advocacy.consumerreports.org/wp-content/uploads/2022/08/2022-Battery-Electric-Vehicles_by-gender-1.pdf

⁷⁰ Kiser, J. (2021, September 9). Interest in electric vehicles has tripled. How can automakers take advantage? Ipsos. <https://www.ipsos.com/en-us/news-polls/Interest-in-electric-vehicles-has-tripled-How-can-automakers-take-advantage>

⁷¹ Hardman, S., Kurani, K. S., and Chakraborty, D. (2020). “The usual policy levers are not engaging consumers in the transition to electric vehicles: a case of Sacramento, California.” *Environmental Research Communications*. Available at: <https://iopscience.iop.org/article/10.1088/2515-7620/aba943>

⁷² Ibid.

⁷³ Ibid.

understanding the conversations between BEV/PHEV owners and non-owners to emulate when designing outreach and infrastructure programs.

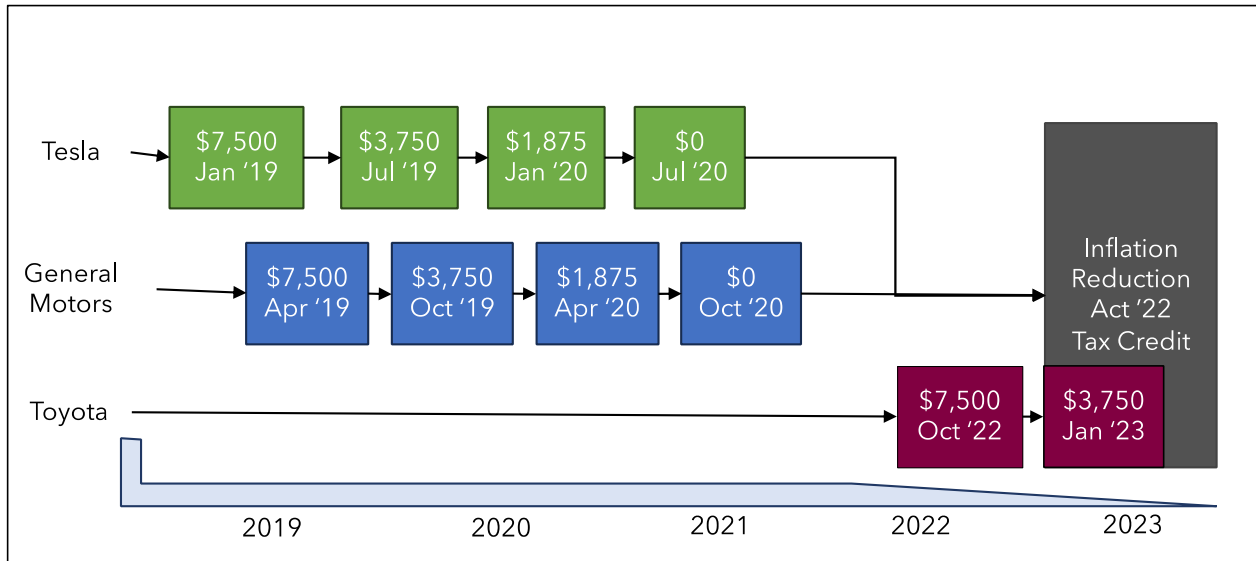
These studies underscore the importance of program outreach and education about PHEV/BEVs in general. Methods for reaching consumers may be more encouraging when focusing on familiarity with the vehicles. Incentives and infrastructure are useful policy measures combined with in-depth knowledge and familiarity. CARB program outreach can be evaluated with this lens to increase consumer participation and knowledge.

Impact of Federal Policies - Federal Tax Credit

The Supplemental Report of the 2019-20 Budget requires CARB to evaluate the impacts of federal policy, such as the federal tax credit, on the adoption of ZEVs. Further, the State Auditor recommended that CARB collect survey information for consumer-focused incentive programs that include the behavioral effects of the federal tax credit. The analysis below builds upon previous data provided annually in the Funding Plan and will continue to be expanded through new survey efforts in the future. The analysis only focuses on the federal ZEV tax credit in place prior to amendments made by the Inflation Reduction Act in 2022. Future iterations of this analysis will include information and data pertaining to the amended federal ZEV tax credit, now known as the Clean Vehicle Credit.

From 2008 to 2022, the Internal Revenue Code Section 30D allowed a tax credit of up to \$7,500 for the purchase of a qualifying plug-in electric vehicle. Before this tax credit phased out in 2022, this tax credit amount would phase out once a vehicle manufacturer sold 200,000 qualified vehicles. Six months after this milestone was reached, the credit amount was cut in half (from a maximum of \$7,500 to \$3,750). After another 6 months, the maximum credit would be cut in half again. Finally, the amount was reduced to \$0 for ZEV purchases from that company at the year and a half mark. Tax credits began to phase out in January 2019 for Tesla, April 2019 for General Motors (GM), and the second quarter of 2022 for Toyota (Figure C-7). Additionally, between August 17 and December 31, 2022, vehicles needed to undergo final assembly within the U.S. to be eligible for the federal tax credit.

Figure C-7: Maximum Tax Incentive Levels for Tesla Motors, General Motors, and Toyota During the Phase-out Period



The CVRP Consumer Survey asks respondents to rate the importance of the federal tax credit in making it possible to acquire an electric vehicle. Those who answered “extremely important” are most influenced by the incentive and can be used as a proxy for those who might not have purchased/leased their vehicle without the tax credit. For applicants adopting a vehicle between December 2020 and September 2022, 43% of CVRP survey respondents said the federal tax credit was extremely important, as shown in Figure C-8. The importance of the federal tax credit is rebounding following a decline in 2020, likely related to the wider availability of the tax credit following the passing of the Inflation Reduction Act of 2022. (see Figure C-9).

Figure C-8: Importance of the Federal Tax Credit Among Clean Vehicle Rebate Project Participants - Clean Vehicle Rebate Project Consumer Survey Edition: 2021-2023 ($n=13,354$)

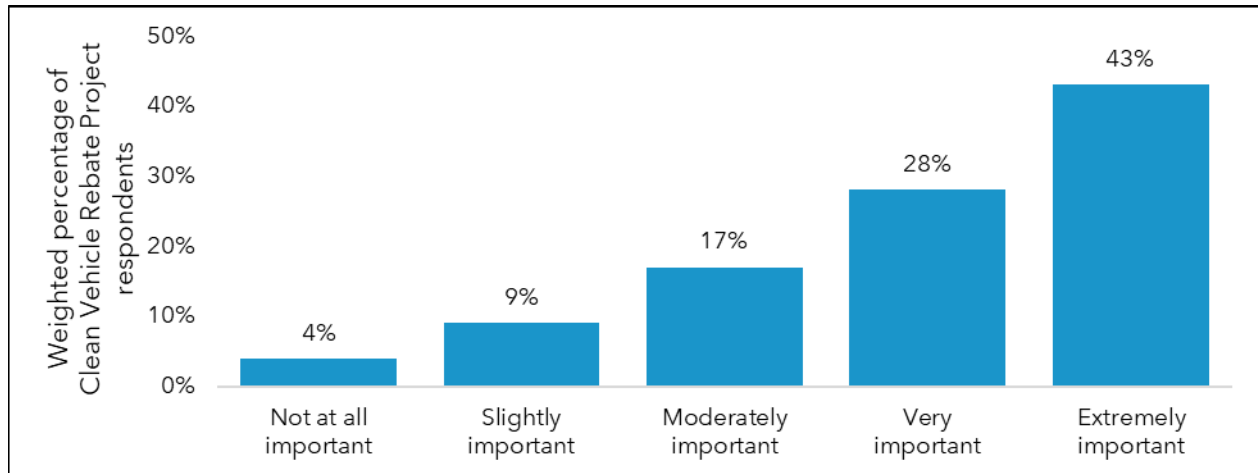
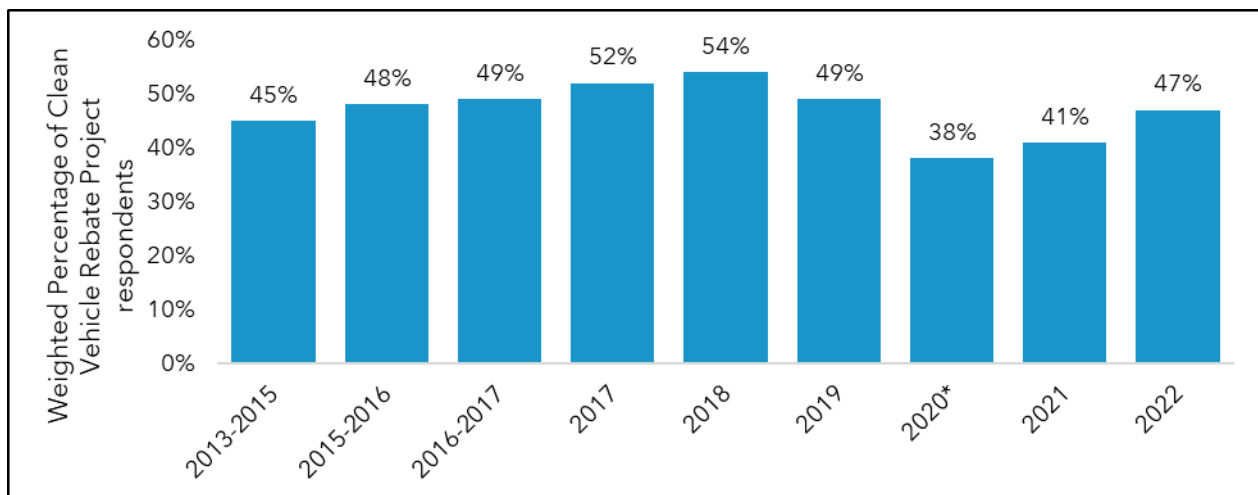


Figure C-9: Percent of Clean Vehicle Rebate Project Participants Indicating the Federal Tax Credit is Extremely Important Over Time - 86,598 Survey Respondents Weighted to Represent 460,414 Rebate Recipients



The decline in reported importance of the tax credit in calendar year 2020 may be linked to the phase-out of federal tax credits for Tesla and GM. These changes provide an opportunity to evaluate the importance of the tax credit and its impact on participants' views of the CVRP rebate. Figures C-10 and C-11 show the percentage of CVRP recipients who obtained either a GM or a Tesla, respectively, and rated the federal tax credit and the CVRP rebate as "extremely important." Both graphs show a decrease in perceived importance over time as the credit amount decreased from \$7,500 to \$0. Even though there was no change in the CVRP rebate amount during these periods, the percentage of participants who rated the rebate as "Extremely important" decreased as well.

Figure C-10: Percentage of Clean Vehicle Rebate Project Respondents Rebated for Tesla Vehicles Rating Incentives as “Extremely Important” During Tesla Phase Out - Clean Vehicle Rebate Project Consumer Survey Edition: 2017-2020

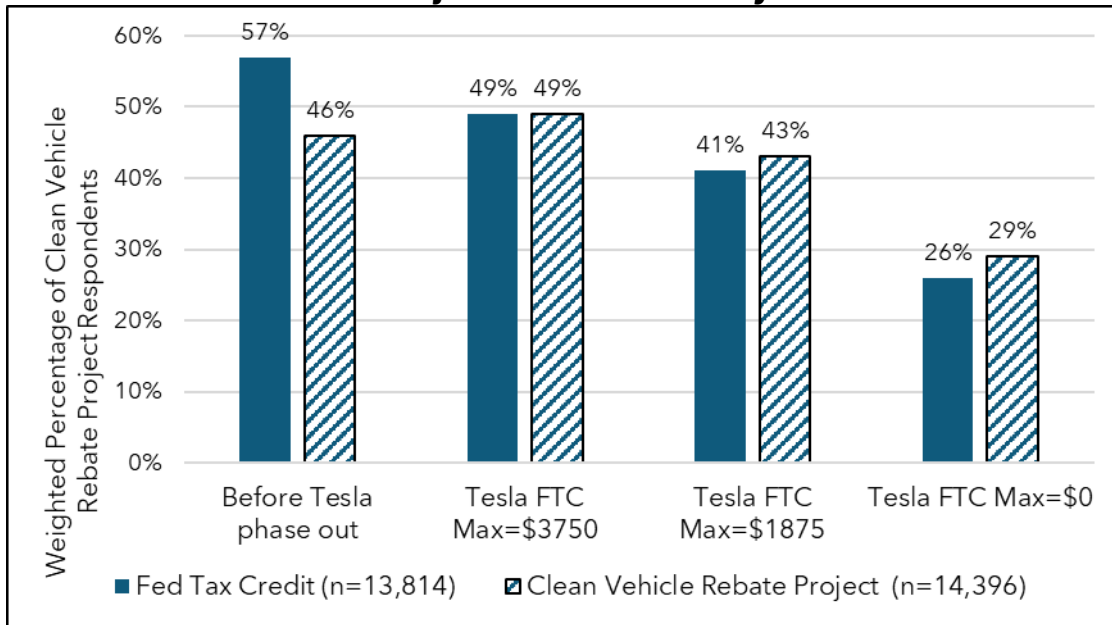
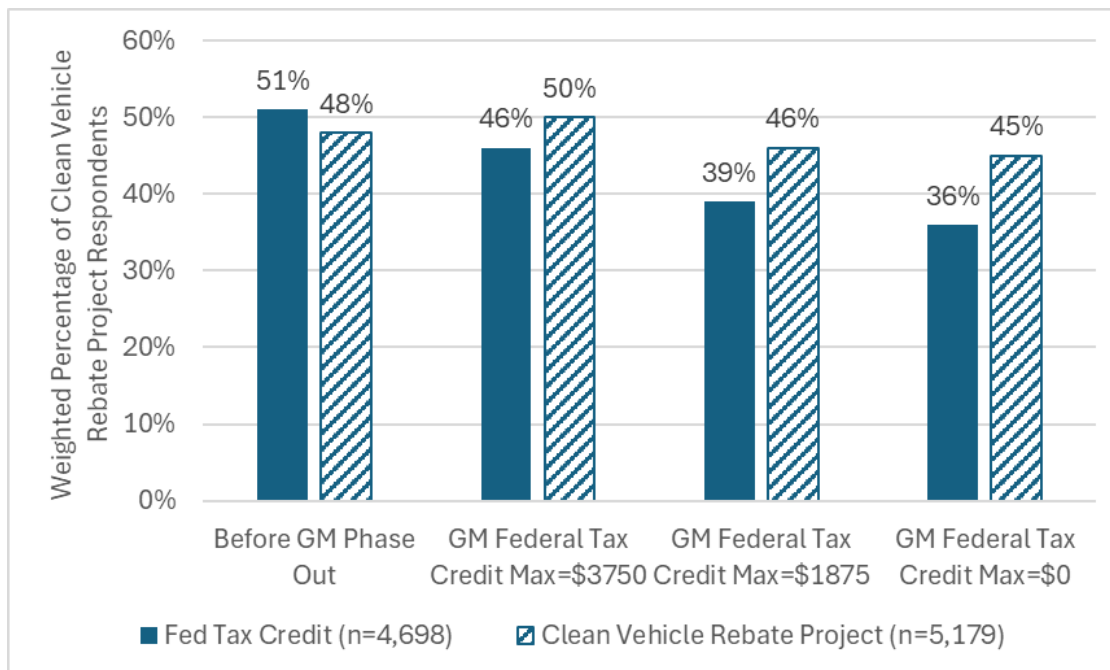


Figure C-11: Percentage of Clean Vehicle Rebate Project Respondents Rebated for General Motors Vehicles Rating Incentives as “Extremely Important” During General Motors Phase Out - Clean Vehicle Rebate Project Consumer Survey Edition: 2017-2020



The CVRP survey responses indicate that both the tax credit and the rebate remain important to over one-third of ZEV consumers despite the phase-out of tax credits for the best-selling manufacturers. The phase-out of tax credits for Tesla and GM showed that decreasing incentive levels are associated with a decrease in participants’ views of the importance of the tax credit in making it possible to acquire a ZEV. As the tax credits have phased out for Tesla, GM, and Toyota, the survey data do not indicate that the CVRP rebate has increased in importance.

On August 16, 2022, the federal Inflation Reduction Act ⁷⁴ was signed into law and includes a number of measures to improve the economy with a focus on working families in America.⁷⁵ One of these measures includes a series of amendments to the Qualified Plug-in Electric Drive Motor Vehicle Credit (IRC 30D⁷⁶), now known as the Clean Vehicle Credit, to

⁷⁴ Text - H.R.5376 - 117th Congress (2021-2022): Inflation Reduction Act of 2022. (2022, August 16). <http://www.congress.gov/>

⁷⁵ The White House Briefing Room. *FACT SHEET: The Inflation Reduction Act Supports Workers and Families*. August 19, 2022. <https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/19/fact-sheet-the-inflation-reduction-act-supports-workers-and-families/>

⁷⁶ Internal Revenue Service. Plug-In Electric Drive Vehicle Credit (IRC 30D). <https://www.irs.gov/businesses/plug-in-electric-vehicle-credit-irc-30-and-irc-30d>

be phased in over the next few years. Starting August 16, 2022, there was an added requirement that electric vehicles must have final assembly in North America to be eligible for the credit.⁷⁷ Starting January 2023, the 200,000-unit cap for manufacturers was removed and new MSRP and income caps were effective.⁷⁸ The MSRP cap is set at \$80,000 for SUVs, vans, and pickup trucks and \$55,000 for all other vehicle classes; the income caps are set at \$150,000 for single tax filers, \$225,000 for those filing head of household, and \$300,000 for those filing jointly.⁷⁹ Starting in 2024, a taxpayer may choose to transfer the credit to a dealer, allowing the buyer to receive the credit as a rebate at the point of purchase and requirements around battery component and critical minerals will take effect.⁸⁰ In addition to amendments to the Clean Vehicle Credit, the Inflation Reduction Act includes the creation of a new tax credit for the purchase of a used ZEV that was effective January 1, 2023.

Additionally, the Biden administration has previously outlined a target of 50% of new vehicle sales in the U.S. must be electric in 2030.⁸¹ These supportive federal policies will be necessary as we look to encourage ZEV adoption. While their actual impact is unknown, they resemble policies that have been successful in other countries. Staff will continue to analyze the changing landscape of federal ZEV policies and report on their impact on ZEV adoption in future iterations of this appendix.

Summary of Sustainable Zero-Emission Vehicle Market Section

Staff has defined the ZEV market reaching and maintaining a 16% to 20% market share of the new light-duty car market as the point at which it would be considered sustainable and no longer need financial incentives for the broader market. This is in addition to vehicle choice diversity that is comparable to the internal combustion engine vehicle market, lower incremental cost for ZEVs, increased availability of charging infrastructure, and a growing secondary market. As noted previously, ZEV car sales soared to more than 12% share of new car sales in California by the end of 2021 and grew to nearly 25% by mid-2024 despite market disruptions caused by global events in 2020 that are still being felt today. Increases in ZEV sales and vehicle diversity and reductions in battery costs are all strong indicators of

⁷⁷ Internal Revenue Service. "Plug-In Electric Drive Vehicle Credit (IRC 30D)". Updated August 16, 2022. Accessed on August 21, 2022. <https://www.irs.gov/businesses/plug-in-electric-vehicle-credit-irc-30-and-irc-30d>

⁷⁸ Text - H.R.5376 - 117th Congress (2021-2022): Inflation Reduction Act of 2022. (2022, August 16). <http://www.congress.gov/>

⁷⁹ Ibid.

⁸⁰ Ibid.

⁸¹ The White House Briefing Room Fact Sheet: President Biden Announces Steps to Drive American Leadership Forward on Clean Cars and Trucks. August 5, 2021. <https://www.whitehouse.gov/briefing-room/statements-releases/2021/08/05/fact-sheet-president-biden-announces-steps-to-drive-american-leadership-forward-on-clean-cars-and-trucks/>

continued market growth. While vehicle choice diversity of PHEVs and BEVs is not comparable to the conventional gas-powered market, the number of available models is growing signaling a shift in manufacturer funding priorities for cleaner vehicle technologies. Lastly, increasing consumer awareness remains an issue where additional work is needed in order to support continued ZEV adoption.

Evaluation of Program Funding Needs (Three Year Need)

California's ZEV market has rebounded since late-2020 with an increase in purchases and leases for new ZEVs. With the advancement of the technology, the current market trend indicates that ZEV costs and fueling time are likely to be reduced, while vehicle range and model choices are expected to increase. However, supply chain issues, inflation, and increasing interest rates have caused vehicle prices to increase. Consumer education and awareness of ZEVs and their benefits have improved and as a result, the California ZEV market increased to more than 18% share of new car sales in California by the end of 2022 and grew to nearly 25% by mid-2024.

The next three to five years are critical for the ZEV market as industry, in response to CARB regulations and growing ZEV mandates around the world, is heavily investing in development and expansion of ZEV production and new government policies around the world are paving the way for the big shift from old polluting technologies to cleaner ones.⁸² During this time, and likely enhanced by CARB regulations to further increase ZEV penetration in new vehicle sales, the California ZEV market will likely leap over the chasm between the early adopter market segment and reach the early majority market. This will lead to adjustments in price and technological features that better serve the needs of the mass market. CARB staff anticipates that at that point, California will reach a sustainable market where government incentives are no longer required for the mass market and efforts will be focused on harder to reach consumer segments and used vehicles.

In this section of the Long-Term Plan, staff evaluates the funding need for CVRP, CC4A, Financing Assistance, and ACCess over the next three years as required by SB 1275. An update on three-year funding needs for CVRP is not included in this update as the program exhausted available funding by November 2023 and is not expected to receive any additional funding. Staff also projects forward ZEV sales out to 2030 if the ZEV market growth continues on its current trajectory to make a preliminary assessment of how the market is doing compared to the State of California's ZEV deployment goals of:

- 1 million vehicles by 2023
- 1.5 million vehicles by 2025
- 5 million vehicles by 2030

⁸² International Energy Agency. Global ZEV Outlook 2019.
<https://www.iea.org/reports/global-ev-outlook-2019/>

The forecast out to 2030 is a requirement of the Supplemental Report to the 2018-19 Budget Act.⁸³ While this report focuses on the ZEV deployment goals established in SB 1275, other CARB documents, such as the Mobile Source Strategy, provide an update on progress and strategies required to meet the State of California's other air quality targets and greenhouse gas reduction goals. The State of California's climate goals impacting the ZEV market include the target set by Executive Order S-03-05 to be carbon neutral by 2045 and Executive Order N-79-20,⁸⁴ which calls for 100% of in-state sales of new passenger cars and trucks be zero emission by 2035. The 2020 Mobile Source Strategy has called for an even more aggressive deployment of zero-emission light-duty passenger vehicles.⁸⁵

Analysis of Incentive Funding Amounts for CVRP, CC4A, and Financing Assistance

Vehicle Purchase Incentive Amounts

Since FY 2022-23, CARB staff has worked with the Center for Sustainable Energy (CSE) to estimate the impact of different incentive levels on vehicle purchase affordability for both new and used ZEV purchasing households using the Affordability Calculator tool from CSE's Caret platform (Calculator). The Calculator includes data and assumptions updated in Q3 2024 and described in this section. The Calculator analyzes the number of affordable vehicle options given an incentive mix for households at different income levels. For this analysis, affordability is defined as spending no more than 15% of one's monthly income on all vehicle costs, including loan principal, interest, fuel, insurance, and maintenance. The calculations are based on a modified financial health rule that says when one is buying a car, one should put 20% down, get a four-year loan, and spend no more than 10% of income on vehicle costs (the 20/4/10 rule, explained further here:

<https://www.capitalone.com/cars/learn/managing-your-money-wisely/what-is-the-20410-rule-for-car-buying/1532>).

The following inputs and assumptions were included in this analysis:

- **New Vehicles:** 2024 model year vehicles listed on fueleconomy.gov, where each vehicle option is a combination of make, model, and trim where that combination is related to all-electric range. For example, the Nissan LEAF includes several options due to differences in range at various trim levels.
- **Used Vehicles:** 2010 to 2021 model year vehicles listed on fueleconomy.gov, where each vehicle option is a combination of model year, make, model, and trim. Trim levels were again counted as separate options if the trim level affects range.

⁸³ Legislative Analyst's Office. (2018). *Supplemental report of the 2018-19 Budget Act*.

<https://lao.ca.gov/reports/2018/3883/supplemental-language-2018.pdf>

⁸⁴ Executive Order N-79-20 <https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-EO-N-79-20-Climates.pdf>

⁸⁵ California Air Resources Board. *Proposed 2020 Mobile Source Strategy*. September 2021.

https://ww2.arb.ca.gov/sites/default/files/2021-09/Proposed_2020_Mobile_Source_Strategy.pdf

- **New Vehicle Base MSRP:** Varies by vehicle, from automaker websites or car journalism publishers such as *Car and Driver*.
- **Used Vehicle Purchase Prices:** Fair Purchase Prices from Kelley Blue Book, priced without options in July 2024.
- **Annual Interest Rate:** Based on national averages for the first quarter of 2024, 7.1% for new vehicles and 11.7% for used vehicles (*Edmunds. (2024). Elevated Auto Loan Rates Hinder New- and Used-Car Shoppers in Q1 2024, According to Edmunds*).
- **Maintenance Costs:** \$74/month, assuming \$0.06 per mile (*FOTW #1190, June 14, 2021: Battery-Electric Vehicles Have Lower Scheduled Maintenance Costs than Other Light-Duty Vehicles*) and 14,489 miles per year (*U.S.D.O.T. (2022). Summary of Travel Trends: 2022 National Household Travel Survey*).
- **Fuel Costs:** Varies by vehicle; based on the fueleconomy.gov default estimates.
- **Insurance Costs:** \$337/month based on national averages (*Timmons, M. (2024). How Much Does Electric Car Insurance Cost?*)
- **Finance Term:** 60 months, based on the national average for new cars rounded to the nearest year (*Jones, J. (2023). Average car payment and auto loan statistics 2023*).
- **Down Payment Ratio:** 10%, modified from the 20/4/10 rule to approximate the grant provided by the Financing Assistance program.
- **Cost-to-Income Ratio:** 15%, modified from the 20/4/10 rule to account for the reality that Californians tend to spend more than 10% of their income on transportation.
- **Sales Tax:** California average sales tax rate of 8.75% (*California Department of Tax and Fee Administration. Tax Guide for Purchasers of Vehicles, Vessels, & Aircraft*).
- **Dealer Fees:** \$641 for new vehicles and \$75 for used vehicles. Based on the highest DMV fee for ZEVs (*California DMV. Vehicle Registration Fee Calculator*).
- **Purchase Power Adjustment:** Income divided by the square root of the household size, applied to account for additional costs (including transportation costs) associated with larger household sizes (More on equivalency scales: <https://www.oecd.org/els/soc/OECD-Note-EquivalenceScales.pdf>).

Using these inputs, the Calculator determined if there are affordable vehicle choices for a four-person household with an annual income of \$93,600, equivalent to 300% the Federal Poverty Level (FPL). The tool modeled incentive scenarios including CC4A, Interest Rate Cap through the Finance Assistance program, and the maximum federal tax credit for new ZEVs. Note new vehicles are identified as 2024 models.

- CC4A, Interest Rate Cap, and the Federal Clean Vehicle Tax Credit – New Vehicles

The Calculator estimated that there are no affordable new vehicle options for a four-person household with an annual income of \$93,600 receiving a CC4A credit of \$9,500 for PHEVs and \$10,000 for BEVs, with an 8% interest rate cap applied through Finance Assistance and

\$7,500 new vehicle federal tax credit applied to the down payment. However, there are some affordable used vehicles, even without incentives.

The Calculator estimates indicate a four-person household with an annual income of \$93,600 without any incentives could afford six combinations of used ZEV model year, make, model, and range-differentiating trim level or approximately four ZEV models.

Table C-4: Affordable Used ZEV Options with No Incentives

Vehicle Size	BEV	PHEV
Small	6	0
Large	0	0

The Calculator estimates that a four-person household with an annual income of \$93,600 receiving a CC4A credit of \$9,500 for PHEVs and \$10,000 for BEVs could afford 66 used ZEV options, or, ignoring model year and trim, 19 used ZEV models.

Table C-5: Affordable Used ZEV Options with CC4A

Vehicle Size	BEV	PHEV
Small	53	10
Large	3	0

The Calculator estimates that a four-person household with an annual income of \$93,600 receiving a CC4A credit of \$9,500 for PHEVs and \$10,000 for BEVs, with an interest rate cap of 8%, could afford 67 used ZEV options or approximately 19 ZEV models.

Table C-6: Affordable Used ZEV Options with CC4A and an Interest Rate Cap

Vehicle Size	BEV	PHEV
Small	55	11
Large	1	0

The Calculator estimated that a four-person household with an annual income of \$93,600 receiving a CC4A credit of \$9,500 for PHEVs and \$10,000 for BEVs, with an interest rate cap of 8%, and applying the \$4,000 Federal Tax Credit for used vehicles, could afford 88 options or approximately 21 models. These options are summarized in the following tables.

Table C-7: Affordable Used ZEV Options with CC4A, an Interest Rate Cap, and a Maximum Federal Tax Credit for Used ZEVs

Vehicle Size	BEV	PHEV
Small	62	23
Large	3	0

Table C-8: Affordable Used ZEV Options with CC4A, an Interest Rate Cap, and a Maximum Federal Tax Credit for Used ZEVs by Vehicle Make

Vehicle Size	Small	Large
BMW	7	0
Chevrolet	9	0
FIAT	7	0
Ford	16	0
Honda	1	0
Hyundai	4	0
Kia	4	0
Mercedes-Benz	4	0
Mitsubishi	4	0
Nissan	9	0
Toyota	3	3
Volkswagen	4	0
Smart	13	0

Clean Cars 4 All

Clean Cars 4 All Projection Methodology

Staff's estimated funding levels for Clean Cars 4 All are based primarily on data collected over four years of implementation, as well as regular consultations with each implementing air district. Staff also made the following assumptions:

- The capacity of each district to process applications is the primary determinant of participation rates given the program's inherently resource-intensive application process.
- Each air district's capacity improves modestly over time due to streamlined processes, improved outreach and education, and greater availability of vehicles in the used ZEV market.
- Each air district receives an increasing number of monthly applications over time.
- The incentive amount (averaged across participants) stayed fairly consistent throughout the past three-year period, although increased incentive amounts were approved in the FY 2022-23 Funding Plan and districts are currently working to implement these changes.
- The demand for the new programs in San Diego and statewide, through the Driving Clean Assistance Program (DCAP), will increase substantially over the next three years.
- Program demand will also increase due to CVRP phasing out.
- Considering the increased incentive amount, the average cost to date of each incentive without administrative funds is \$11,100.
- Average program implementation funds for all programs is assumed to be 22%.

Participation and funding projections are made air district by air district before being aggregated to a total funding estimate for each of the three fiscal years. To account for uncertainty, staff estimated a range of values for each year. Table C-9 summarizes historic consumer participation for each air district.

Table C-9: Historic Consumer Participation by Air District

Air District	Fiscal Year 16-17	Fiscal Year 17-18	Fiscal Year 18-19	Fiscal Year 19-20	Fiscal Year 20-21	Fiscal Year 21-22	Fiscal Year 22-23	Fiscal Year 23-24⁸⁶
South Coast Air Quality Management District	947	1,008	1,725	1,733	1,452	589	1,032	1,053
San Joaquin Valley Unified Air Pollution Control District	364	274	704	984	712	307	765	915
Bay Area Air Quality Management District	0	0	15	695	684	431	947	519
Sac Metro Air Quality Management District	0	0	0	0	328	179	213	179
San Diego Air Pollution Control District	0	0	0	0	0	0	0	11
Total Participants	1,311	1,282	2,444	3,412	3,176	1,506	2,957	2,677

The Assembly Bill (AB) 630 Report highlights annual performance goals and evaluates the CC4A program. CC4A continues to make significant progress to provide equitable access to clean transportation options for people living in low-income and disadvantaged communities in California. Despite the success of the program to date, including the expansion to the San Diego air district, there remain many Californians that could benefit from the program but reside outside the regions where air districts participate in CC4A. These include disadvantaged, tribal, rural, and low-income communities. Therefore, DCAP will expand access statewide and implement a needs-based model as opposed to the

⁸⁶ Data includes Q3-Q4 of 2023 and Q1 of 2024. Data for Q2 of 2024 is not available to be included for FY 23-24.

first-come, first-served model that is currently used by the district CC4A programs. CC4A must also build upon the program's existing approach and develop a community-level focus on consumer protection, outreach, and education. This shift in program design would specifically address community concerns with the current first-come, first-served model and ensure that funding is prioritized for Californians in most need, respect the needs of local communities, as well as support California's climate and air quality commitments. For more information regarding the AB 630 Report, visit Appendix G.

To better inform funding demand based on the ZEV market, staff recognizes the need for a used ZEV market analysis. A handful of CARB research projects in collaboration with the University of California are underway to study the used ZEV market. Staff is actively pursuing the findings to better understand the dynamics of the used ZEV market as well as characteristics and behavior of consumers in this market. Once data become available, the information will be used to inform policy and funding decisions moving forward.

Clean Cars 4 All Three-Year Funding Need

Table C-10 shows staff's projected participation levels in the Clean Cars 4 All programs over the next three fiscal years and the corresponding funding needs for each year. Overall, staff estimates a steady increase in participation over the coming three years as the existing programs continue to grow and the additions of programs in San Diego air district and statewide, through DCAP. The total funding amount includes the average cost per incentive plus the associated administrative funds.

Table C-10: Projected Participation and Funding Ranges

Air Districts	Fiscal Year 2024-25	Fiscal Year 2025-26	Fiscal Year 2026-27
South Coast Air Quality Management District	1,900 - 2,100	2,000 - 2,200	2,100-2,300
San Joaquin Valley Unified Air Pollution Control District	2,100-2,300	2,200-2,400	2,300-2,500
Bay Area Air Quality Management District	700-900	800-1,000	900-1,100
Sac Metro Air Quality Management District	150-350	250-450	350-550
San Diego Air Pollution Control District	50-100	100-300	200-400
Statewide	200-500	2,500-3,500	3,500-4,000
Total Participants	5,100 - 6,250	7,850- 9,850	9,350-10,850
Total Funding (in millions)	\$69-\$85	\$106-\$133	\$127-\$147

Impact of Proposed Clean Cars 4 All Program Changes

Although there are no proposed changes to project criteria, CARB staff is working with air districts to implement project changes approved in the FY 2023-24 Proposed Funding Plan. These changes included the addition of zero-emission motorcycles as an eligible vehicle replacement type, and increased incentive levels to accommodate costs associated with adaptive equipment for eligible Californians with physical disabilities. While these changes are likely to increase program demand, it is too early to estimate the magnitude of the impact. However, CARB staff continues to work with districts to determine the impacts of these changes. Over the next three years, staff will continue to monitor program data,

market conditions, and collaborate with stakeholders to identify any necessary policy changes. In coordination with DCAP, staff will be considering how and when to phase out conventional hybrid replacement vehicles to maximize emission benefits and help CARB meet its ZEV deployment goals. Staff will be closely monitoring participation in the new CC4A program in San Diego and DCAP.

Financing Assistance

Financing Assistance Projection Methodology

To date, \$67 million has been allocated for both Financing Assistance pilot programs, the regional Driving Clean Assistance Program which has received \$8 million, and the statewide Clean Vehicle Assistance Program which has received \$45 million. \$80.5 million of FY 2022-23 appropriation and remaining funds from FY 2021-22 along with \$10 million for the Zero-Emission Assistance Program and \$125 million to establish Statewide CC4A was solicited to establish a joint Financing Assistance and Statewide CC4A program, now known as the Driving Clean Assistance Program. The Community Housing Development Corporation was selected to administer and launch the new joint program in 2024.

The Financing Assistance project was a pilot project implemented under two separate programs with different approaches. Considering the lessons learned from these pilots and in close collaboration with stakeholders, staff is developing a full-fledged project by merging the two programs and adopting the needs-based model to better serve low-income consumers. The new program will consider the most recent changes in the ZEV market, as well as using data from the local and statewide programs. Updates will be made as more data becomes available through the implementation of the new project. These three-year projections are subject to change as more data becomes available, so staff will reevaluate funding needs annually. Staff has determined that projections based on program data are likely to adequately capture the dynamics of this program over the next three fiscal years.

To better determine the highest bound for funding based on market demand staff recognizes the need for a used market analysis. A handful of CARB research projects in collaboration with the University of California are underway to study the used ZEV market. Staff is actively pursuing the findings to better understand the dynamics of the used ZEV market as well as characteristics and behavior of consumers in this market. Once data become available, the information will be used to inform policy and funding decisions moving forward.

Financing Assistance Three- Year Funding Need

Table C-11 shows staff's projected funding need for Financing Assistance program over the next three fiscal years. Overall, staff estimates a steady increase in program interest and participation over the coming three years as CVRP is phasing out. Staff anticipates the program grows statewide and new and used ZEVs become more popular and available.

However, projecting demand for this program, given its upcoming shift to a needs-based approach, is difficult given the lack of data. Staff will update these estimates annually through a public process, allowing the opportunity to incorporate new information and to refine our estimates as we learn more from the new needs-based approach.

Table C-11: Financing Assistance Three-Year Funding Estimates

Financing Assistance for Lower-Income Consumers	Fiscal Year 2022-23	Fiscal Year 2023-24	Fiscal Year 2024-25
Total Funding (in millions)	\$110-\$120	\$120-\$150	\$150-\$200

Impact of Proposed Financing Assistance Program Changes

As the new statewide Driving Clean Assistance Program launched in September 2024, no major changes are proposed in the FY 2024-25 Funding Plan.

Access Clean California

Access Clean California Projection Methodology

The overarching goals for Access Clean California for the upcoming three years are to: continue expanding the outreach partner network to fill outreach gaps, with an emphasis on partnering with community-based organizations and similar grassroots organizations; expand and improve the Benefits Finder application webtool and supporting case management system; and continue to leverage the project to improve community feedback on CARB’s larger portfolio of incentive and regulatory programs.

CARB staff estimates that between \$5 million to \$7 million in funding would be needed in each of the next three fiscal years to achieve these goals. Staff’s projected funding need reflects CARB’s intent for Access Clean California to play a critical role supporting the development and implementation of a needs-based implementation model for Financing Assistance, and similarly supporting statewide Clean Cars 4 All. Staff estimates \$3 million to \$5 million of the projected funding demand would go to supporting Access Clean California’s existing outreach partners network, which currently consists of over 21 non-profit and community-based organizations, and to expand the network to additional community organizations to fill outreach gaps. Based on funding expended to date, staff estimate that at least 50% of the future funding need for Access Clean California will be to directly support outreach-related activities conducted by the project’s outreach partners.

Staff estimates the majority of the remaining annual funding need—approximately \$1 million to \$2 million—would be used to continue building and/or maintaining resources that help outreach partners implement their strategies to educate and engage their communities. These resources include the Benefits Finder application webtool and case management system, the outreach partner Resource Hub, monthly meetings, newsletters, etc., that the outreach partners use to support implementation of their strategies to educate and engage their communities. To ensure the Benefits Finder makes it as easy as possible for applicants

to stack the various available incentives, funding will also be needed to integrate new consumer-focused, climate equity incentive projects, including but not limited to the clean vehicle incentive projects currently being developed by investor-owned electric utilities using CARB’s Low-Carbon Fuel Standard holdback credit funds. Finally, staff estimates that approximately 5% of the total funding allocation would be used to facilitate improved community feedback on CARB’s incentive and regulatory programs.

Access Clean California Three-Year Funding Need

Table C-12 shows staff’s estimated total funding need for each year for Access Clean California. Overall, staff estimates an increase in the number of outreach partners throughout the State and increased participation via the Benefit Finder. Staff anticipates the percentage of funding directly passed through to support outreach partner organization activities will increase slightly each year, as the up-front costs associated with developing the supporting resources (e.g., Benefits Finder and Resource Hub) decline and operational efficiencies are gained over time. Staff will update these estimates annually through a public process, allowing the opportunity to incorporate new information and to refine our estimates. Rationale for estimates is described in further detail below.

Table C-12: Access Clean California Three-Year Funding Estimates

Access Clean California	Fiscal Year 23-24	Fiscal Year 24-25	Fiscal Year 25-26
Total Funding (in millions)	\$5-\$7	\$5-\$7	\$5-\$7

Impact of Proposed Changes to Access Clean California

Staff is not proposing any significant policy changes at this point.

CVRP Three-Year Funding Need

Staff did not analyze the three-year need for CVRP because the program exhausted existing funding in November 2023 and the program is not expected to receive additional funding.

Long-Term Vision for CARB Light-Duty Vehicle Purchase Incentive Programs

As previously stated, this document provides a minor update to the Long-Term Plan for Light-Duty Vehicles. During the development of the major update in FY 2022-23, staff held three virtual public workshops to discuss the overall themes of this portion of the document with stakeholders and to inform staff’s analysis of the ZEV market and vehicle purchase incentive programs. Public workshops were held on February 10, March 30, and June 22 of

2022.⁸⁷ Over the course of these workshops, staff provided updated information about the ZEV market, available technology, incremental costs for ZEVs, market sustainability metrics, the equitable transition to zero emissions, and CARB's long-term vision for its clean vehicle incentive program.

Throughout the process, stakeholders expressed their support for several improvements to CARB's vehicle purchase incentive programs that were approved by the Board in 2022 and continue to be implemented. These include:

- Increased incentive amounts as costs for new and used vehicles increase
- Increased program alignment to improve the consumer experience with vehicle purchase incentives
- Increased outreach and a focus on priority communities with historically low vehicle purchase incentive program participation rates
- Additional partnerships with an increasing number of community-based and grassroots organizations for program outreach and implementation
- Increased support of the used ZEV market
- Expansion of prequalification for CVRP statewide to bring all vehicle purchase incentives to the point of purchase

These stakeholder suggestions align with CARB's priorities for light-duty vehicle purchase incentive programs for the longer term.⁸⁸ These priorities include improving the consumer experience through increased program alignment, consolidation of programs and/or applications, and a move to a needs-based model of implementation. Additionally, it is a top priority to increase outreach through community-based organizations and other grassroots efforts to improve awareness of and access to clean transportation incentives in priority communities. Another key priority is to set incentive amounts to levels that are sufficient to assist low- and moderate-income consumers with the switch to zero-emission vehicles. It is also important that CARB's vehicle purchase incentive programs fund the cleanest vehicle technology in order to support California's various air quality and climate goals. Lastly, it is a priority to increase support for used ZEVs in an effort to keep these clean vehicles in California and to provide an affordable ZEV option for car buyers.

With stakeholder input and agency priorities in mind, CARB approved several program changes to be implemented to light-duty vehicle purchase incentive programs over the past few fiscal years. These proposed program changes included:

⁸⁷ California Air Resources Board. Low Carbon Transportation and Air Quality Improvement Program Meetings and Workshops. <https://ww2.arb.ca.gov/our-work/programs/low-carbon-transportation-investments-and-air-quality-improvement-program/low-0>

⁸⁸ California Air Resources Board. Third Public Workshop on the Fiscal Year 2022-23 Update to the Three-Year Plan for Light-Duty Vehicles and Clean Transportation Investments. June 22, 2022. <https://ww2.arb.ca.gov/our-work/programs/low-carbon-transportation-investments-and-air-quality-improvement-program/low-0>

- Increasing incentive amounts for lower income car buyers.
- Expanding pre-qualification statewide for CVRP to bring all incentives to the point of purchase for low-income car shoppers.
- Continued alignment across programs where possible.
- Increasing partnerships with and outreach through community-based organizations and other grassroots organizations.
- Piloting a needs-based approach that could be implemented across all vehicle purchase incentive programs.
- Implementing a single application for all vehicle purchase incentive programs through ACCess.
- Expanding support of electric bicycles for low-income consumers.

With California ZEV market share at over 25% and no additional funding expected for CVRP, staff closed CVRP on November 8, 2023, when existing funding was completely exhausted. This marked the shift of CARB's vehicle purchase incentive programs to a sole focus on lower-income consumers through Financing Assistance and CC4A. Beyond FY 2024-25, CARB staff recognize that there will need to be continued investment in the used ZEV market, particularly for consumers who do not have a vehicle to scrap, to help enable affordable ZEV options for consumers and continued growth in this segment of the market.

CARB staff will work with stakeholders through the public process to further discuss and implement these changes in the various vehicle purchase incentive programs over the next few fiscal years. As the ZEV market grows, staff will update this analysis, adjust programs as needed, and provide updates in future iterations of this plan.

Conclusions

Considering the current state of ZEV technology, the ZEV market, the economy, and fuel prices, the market is moving toward the path to achieve the State of California's ZEV deployment goals. California met the 2023 and 2025 ZEV deployment goals early according to data from entities responsible for tracking car sales and registration in California. However, increased stringency of CARB's ZEV program and requiring by 2035 that all new vehicle sales be 100% ZEV will further efforts toward meeting these goals and help stabilize the market.

ZEVs have yet to become the mainstream option for vehicle purchasers, and there are still challenges that many consumers must overcome before choosing this new technology over gas-powered vehicles. Availability of less expensive ZEVs and a more diverse selection in different vehicle classes with higher ranges is needed to make ZEVs more favorable than conventional gas-powered vehicles. Lastly, a greatly expanded and reliable ZEV charging infrastructure network is critical to achieving the widespread adoption of ZEVs that is needed to meet California's various climate and air quality goals.

Incentives are more essential than ever before as the market is approaching the early majority segment, or mainstream consumers, who are sensitive to pricing and vehicle utility.

Incentives will continue to encourage mainstream consumers to purchase cleaner vehicles and help maintain the current momentum of the ZEV market. Continued investments in light-duty vehicle purchase incentives will be key over the next 10 to 15 years, especially as these programs further hone their focus on priority populations who need the most help getting into zero-emission vehicles. Multi-year funding allocations will be of most importance as they eliminate program disruption, improve consumer confidence in the programs, allow for long-term planning of programs, and allow programs to be responsive to current market conditions.

CARB continues to make improvements to CARB's light-duty vehicle purchase incentive programs that will continue to expand access to cleaner vehicles in priority populations. This includes increasing incentive amounts, expanding outreach through community-based organizations, simplifying the application process, and expanding incentive support of the used ZEV market. This additional targeted support is critical to achieving the equitable, widespread ZEV adoption needed to meet California's various climate and air quality goals. Staff will provide continued updates to the Long-Term Plan which will be included in upcoming funding plans.