

# Clean Vehicle Assistance Program Final Report

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State Foundation

Prepared by  
Center for Sustainable Energy



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# I. Executive Summary

The Clean Vehicle Assistance (CVA) Program provides grants and loans to low- to moderate-income individuals who purchase an eligible new or used conventional hybrid electric vehicle (HEV), plug-in hybrid electric vehicle (PHEV), or battery electric vehicle (BEV) – collectively referred to as “clean vehicles.” The program is administered by Beneficial State Foundation (BSF) on behalf of the California Air Resources Board (CARB). All CVA Program participants are invited to complete an “adoption survey” approximately one month after purchasing their vehicle as well as an “ownership survey” approximately one year after purchasing their vehicle. The goals of these surveys include improved understanding of CVA Program participant motivations, concerns, and experience regarding their clean vehicle and the CVA Program.

This report is a follow up to the CVA Program Evaluation Report, which summarized adoption survey findings from grant recipients who participated in the first phase of the program (2018-2019). This report expands on those findings in three ways. First, the vehicle types and participant demographics are summarized for all adoption survey respondents from the first and second phases (2018-2020). Second, the adoption survey results from participants in the second phase (2020) are summarized. Finally, the participants from phase one have now received the ownership survey and those results are summarized.

Key findings include the following.

- Almost 90% of adoption survey respondents would not have purchased their clean vehicle without the CVA Program.
- Satisfaction with the CVA Program increased from the 2018-2019 adoption survey to the 2020 adoption survey. The share of respondents who were very satisfied with the online application process rose from 73% to 81%, and the share of respondents who were very satisfied with their customer experience rose from 77% to 88%.
- A large majority of vehicles purchased through the CVA Program are electric vehicles. Only 8% are HEVs.
- The CVA Program is making EVs accessible to a more diverse group of consumers than those who have typically purchased EVs in the past. Compared with available data from the Clean Vehicle Rebate Program (CVRP), CVA Program participants are younger, more likely to be female, and less likely to have a postgraduate degree.
- The top three concerns for BEV and PHEV owners were cost, electric range, and battery lifespan, respectively. These concerns have remained consistent throughout the lifetime of the program.
- Ownership survey results show that after owning their vehicle for approximately one year, 88% of respondents would “definitely” or “probably” recommend their vehicle to a friend.

- Most BEV drivers reported that their vehicle’s range had been insufficient for some desired trips. This issue was much more prevalent with used BEVs than new BEVs.

## II. Introduction

The Clean Vehicle Assistance Program (CVAP) provides grants and loans to low-to-moderate-income individuals who purchase a new or used conventional hybrid electric vehicle (HEV), plug-in hybrid electric vehicle (PHEV), or battery electric vehicle (BEV). Participants who purchase a BEV or PHEV are also eligible for a charging station grant. The program, administered by Beneficial State Foundation (BSF) on behalf of the California Air Resources Board (CARB), began in June 2018. The grants and loans are available to California residents with a maximum annual household income equivalent to 400% of the federal poverty level. Loans are available through the program’s preferred lender, Beneficial State Bank (BSB), or participants can secure a loan from a lender of their choosing.

Participants are surveyed twice after receiving their grant. The first survey, known as the adoption survey, takes place approximately one month after an approved applicant redeems a CVA Program vehicle grant. This survey focuses on the participants’ motivations for adopting a clean vehicle, concerns they had prior to the purchase, and impact of the CVA Program on their decision to purchase their vehicle. The second survey, referred to as the ownership survey, takes place approximately one year later. This survey focuses on participants’ experience owning and operating their clean vehicle.

## III. Survey Objectives

### Adoption Survey

The objectives of the CVAP adoption survey are to understand participant:

- Household demographics;
- Travel behavior before and after acquiring their clean vehicle;
- Primary motivations for clean vehicle adoption and the factors that enabled their clean vehicle adoption;
- Barriers to adoption such as model selection, charging availability, range, and costs of insurance and fuel;
- Travel needs and how they would have been met had the program not existed; and
- Vehicle charging behaviors.

### Ownership Survey

The objectives of the CVAP ownership survey are to understand participant:

- Clean vehicle usage and ownership experience;
- Clean vehicle ownership travel behaviors and how current habits and needs are being met;
- Access to vehicle charging and charging behaviors;
- Satisfaction with clean vehicle range compared to pre-ownership perceptions;
- Assess challenges, including fuel choice, costs of insurance and fuel, and maintenance.
- Satisfaction with the CVAP loan.

## IV. Methods

### Sampling and Administration

#### **Adoption Survey**

The CVA Program adoption survey is administered on a monthly basis, with invitations sent to all program grantees by email approximately one month after they acquire their clean vehicle. Table 1 shows the dates between which survey invitations were sent and survey responses were received. Up to two email reminders are sent to participants that have not yet completed the survey. To increase the response rate of the survey, all participants who complete the survey are entered into a random, twice-annual drawing for a \$100 Visa gift card.

#### **Ownership Survey**

The CVA Program ownership survey is administered approximately one year after program participants acquired their clean vehicle. Table 2 shows the dates between which survey invitations were sent and survey responses were received. Up to two email reminders are sent to participants that have not yet completed the survey. All participants who complete the survey are entered into a random, twice-annual drawing for a \$100 Visa gift card.

### Response Rate and Representativeness

Since only a portion of program participants answered the survey, the responses are potentially not representative of all program participants (i.e., non-response bias). Response weights can be created to adjust for bias and lack of representation among groups in the data. To check if the survey data was representative of the population, and if weighting was necessary, the research team compared the proportion of new and used vehicles between the survey respondents and the program population. For the adoption survey, there was no significant difference between the program population and the survey data, likely due to the relatively high response rate. Therefore, the adoption survey data was not weighted for this analysis. Response rates are summarized in Table 1.

For the ownership survey, participants who had purchased a new vehicle were over-represented among survey respondents compared to those who had purchased a used vehicle. In other words, those who

purchased a new vehicle were more likely to answer the survey than those who purchased a used vehicle. Accordingly, these data were weighted to adjust for differences between respondents and program participants and are used to report the results from the ownership survey. Response rates are summarized in Table 2.

**Table 1. CVA Program adoption survey administration dates for data presented in this report**

<b>Survey Invite Dates</b>	7/13/2020 – 10/22/2020
<b>Response Dates</b>	7/13/2020 – 10/23/2020
<b>Vehicle Purchase Dates</b>	3/15/20 – 9/12/20
<b>Program Participant Population</b>	428
<b>Survey Responses</b>	289
<b>Response Rate</b>	68%

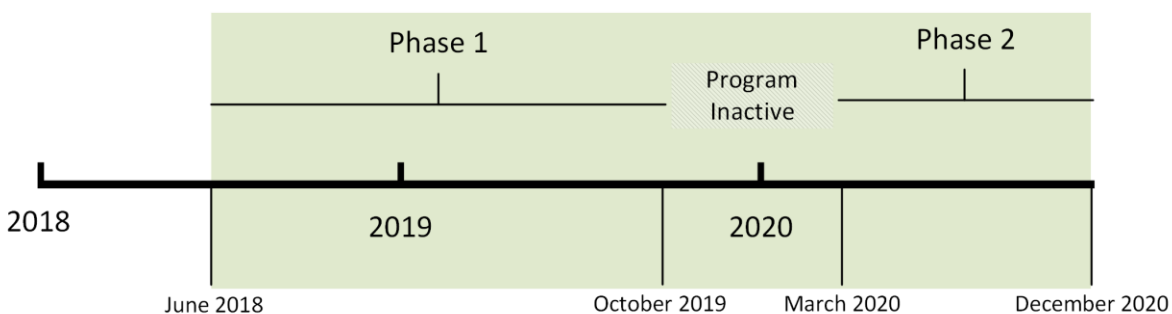
**Table 2. CVA Program Ownership Survey Summary**

<b>Survey Invite Dates</b>	6/17/2020 – 7/02/2020
<b>Response Dates</b>	6/17/2020 – 9/28/2020
<b>Vehicle Purchase Dates</b>	6/25/18 – 10/12/19
<b>Program Participant Population</b>	454
<b>Survey Responses</b>	168
<b>Response Rate</b>	37%

## V. Results

### Adoption Survey – Phase 1 & 2

**Figure 1. Respondents included in adoption survey phase 1 and 2 results**



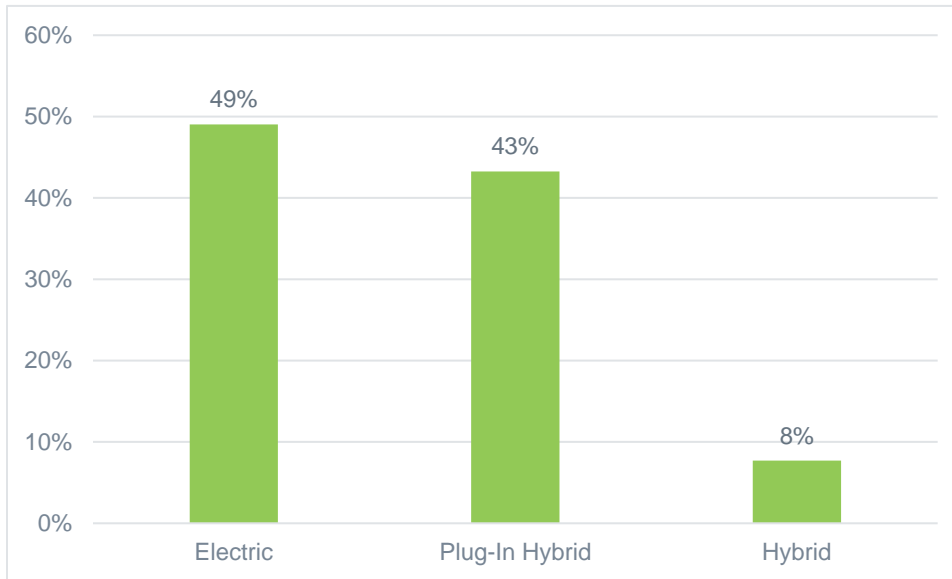
This section summarizes the vehicle choices and demographic information of all phase 1 and phase 2 adoption survey respondents, as shown in the shaded area of Figure 1



### Vehicle Summary

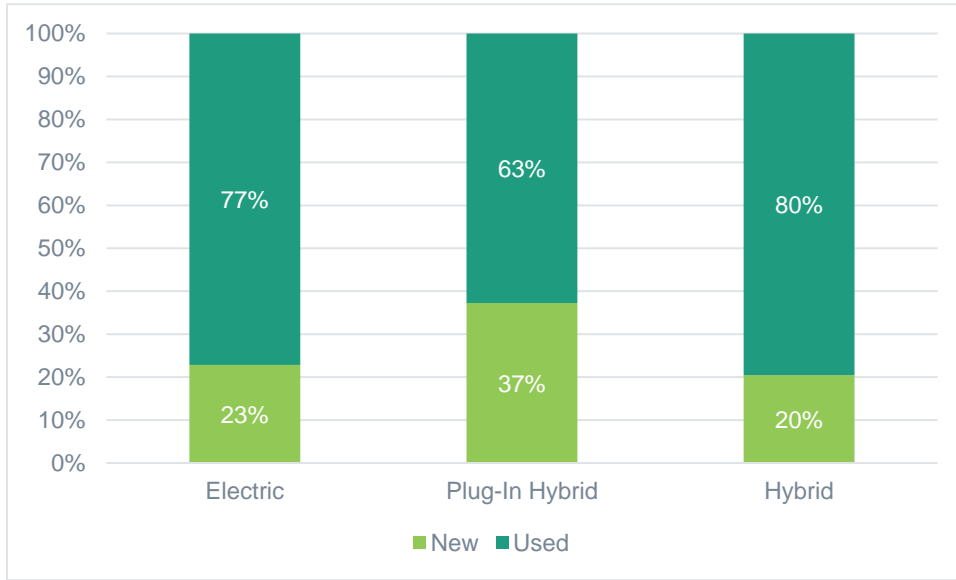
Plug-in vehicles (BEVs and PHEVs) made up 92% of the vehicles purchased through CVA Program. BEVs were the most popular and were purchased by almost half of CVA Program participants (49%), followed by PHEVs at 43% (Figure 2). Only 8% of adoption survey respondents had purchased conventional hybrids (HEVs). This is likely due to the smaller rebate received for HEVs (\$2500 versus \$5000 for a PHEV or BEV).

**Figure 2. Technology type of vehicles in CVA Program**

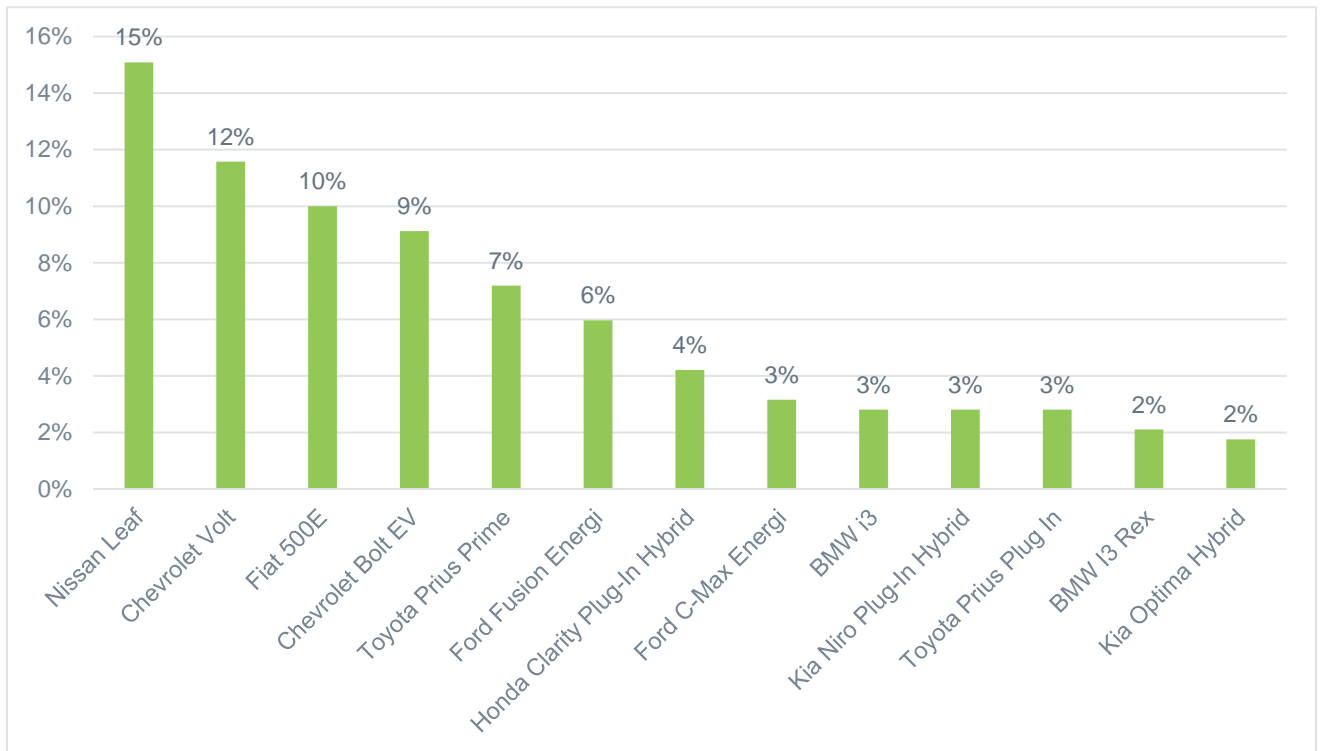


Overall, 71% of adoption survey respondents purchased a used vehicle. The proportion of new versus used vehicles did vary by technology type, with PHEVs being more likely to be purchased new than BEVs or HEVs. (Figure 3). The most commonly purchased BEV was the Nissan LEAF, and the most commonly purchased PHEV was the Chevrolet Volt (Figure 4.)

**Figure 3. New or used vehicle status by technology type**



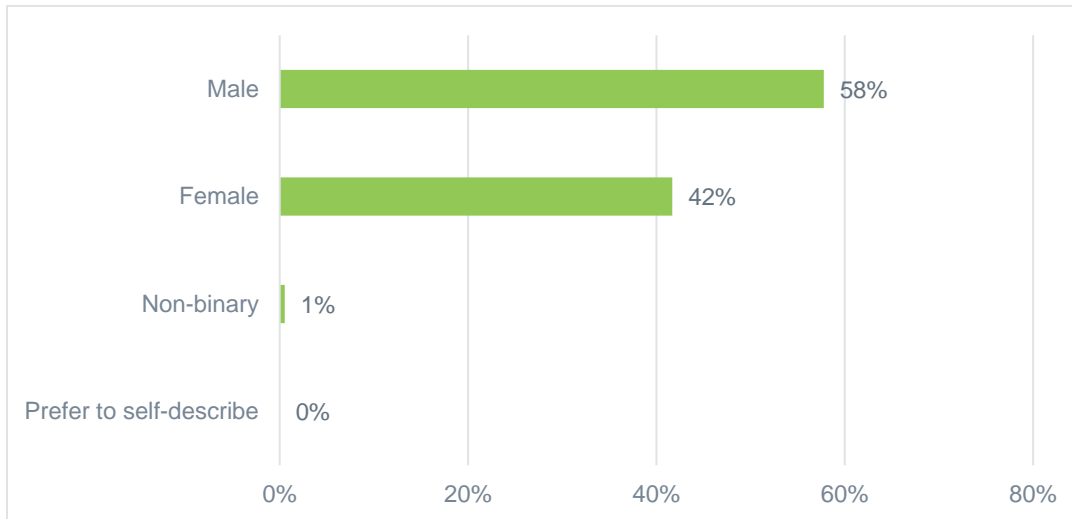
**Figure 4. Most frequently purchased vehicle make/models**



## Demographics

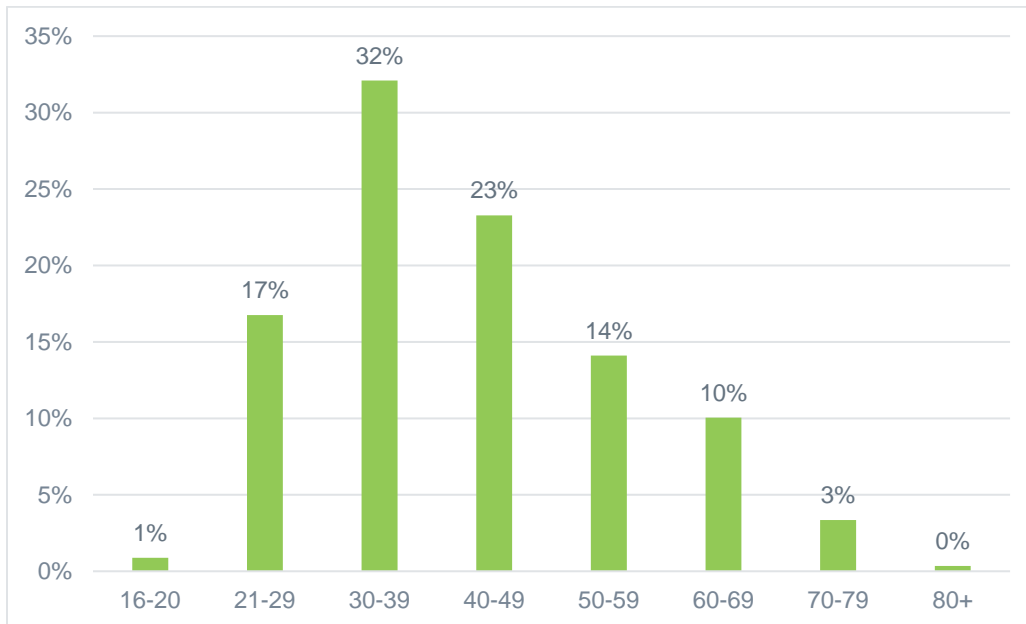
Gender has shifted towards more male representation from 2019 to 2020. The 2019 CVA Program Evaluation Report showed that males were 52% of respondents, while males are 64% of the adoption survey respondents in 2020. Overall, males made up 58% of adoption survey respondents from 2018-2020 (Figure 5). Age, race, and ethnicity are shown in Figures 6-8 and education, homeownership status and residence type are shown in Figures 9-11.

**Figure 5. Gender**



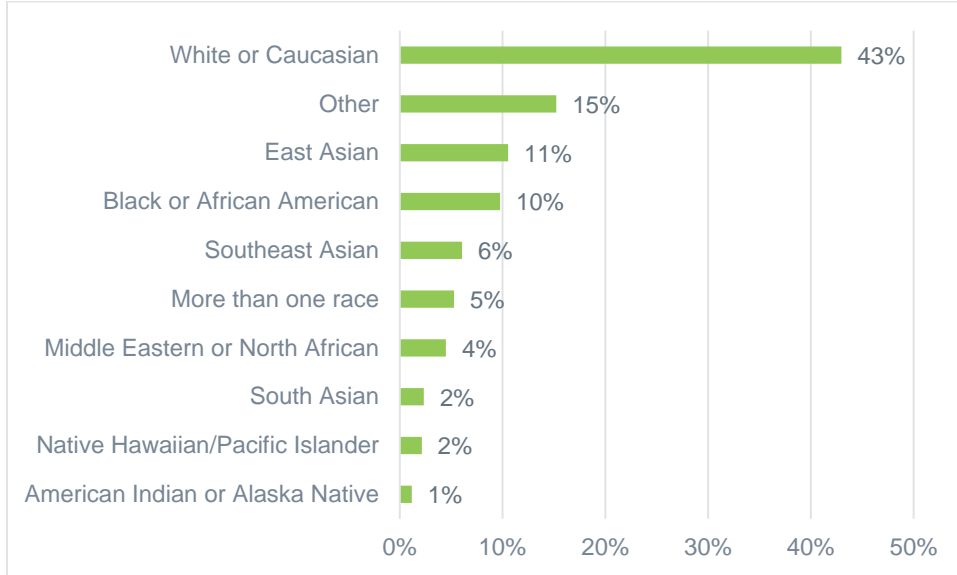
Note: excludes 15 respondents who selected “Prefer not to answer.” Percentages add to 101% due to rounding.

**Figure 6. Age**

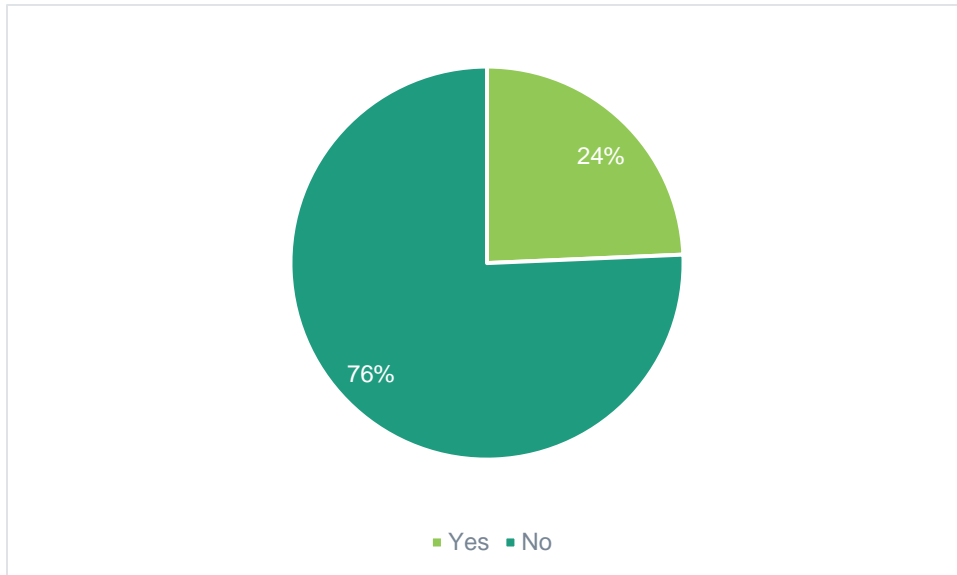


The percentage of respondents identifying as white or Caucasian has decreased from 2018-2019, when it was 52%. This decrease has corresponded with an increase in participants who identify as East Asian or Southeast Asian. The percent of respondents who identify as Latinx remains similar.

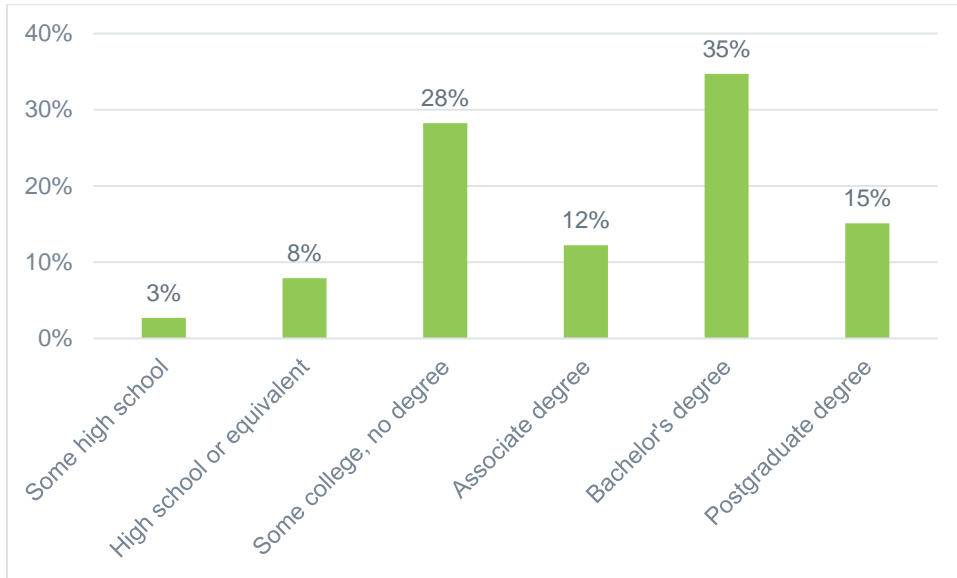
**Figure 7. Racial identity**



**Figure 8. Latinx**

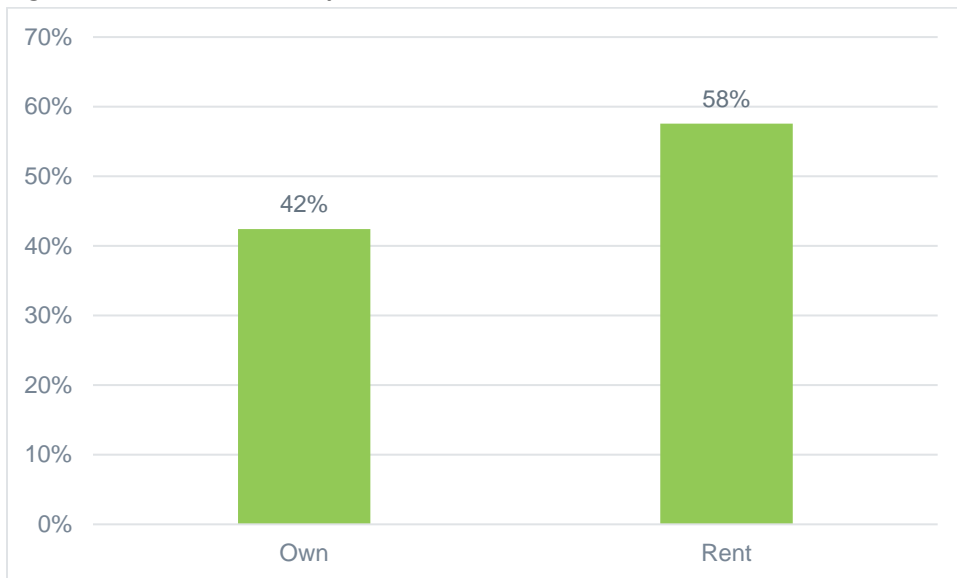


**Figure 9. Education**



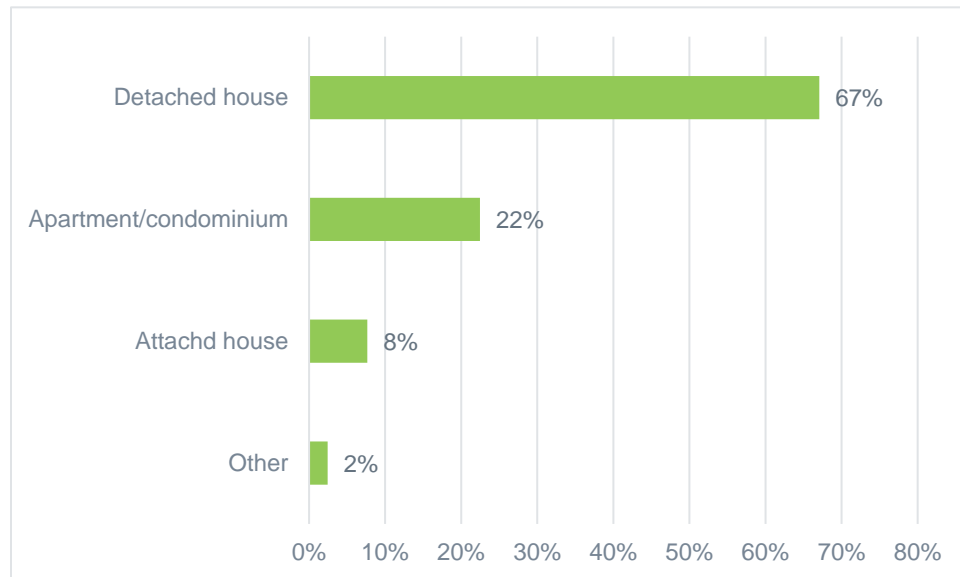
Forty-two percent of CVA Program participants are homeowners (Figure 10). This is lower than the state average of 55%<sup>1</sup>, which is likely due to the income criteria for the CVA Program.

**Figure 10. Home ownership**



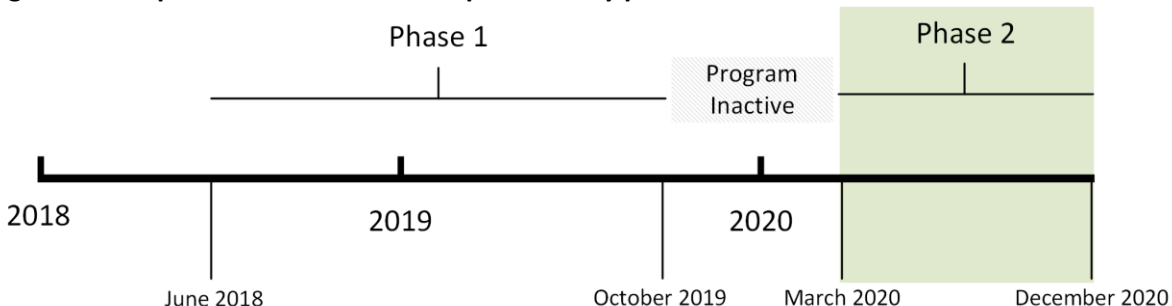
<sup>1</sup> <https://fred.stlouisfed.org/series/CAHOWN>

**Figure 11. Residence type**



## Adoption Survey – Phase 2

**Figure 12. Respondents included in adoption survey phase 2 results**

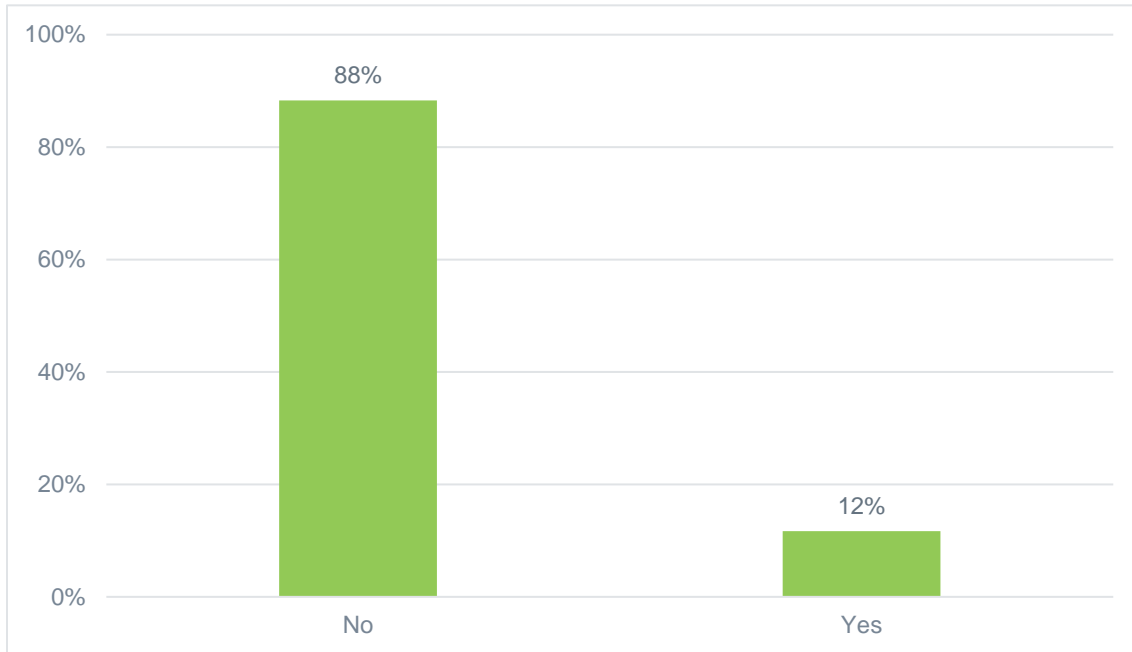


The following section summarizes findings from the adoption survey respondents who purchased their clean vehicle during phase 2 of the program, as shown in Figure 12. There were no large differences between these respondents and the phase 1 adoption survey respondents. The program continues to be very impactful, and the primary motivations and concerns about purchasing a clean vehicle remained consistent with the phase 1 respondents.

### Program Impacts

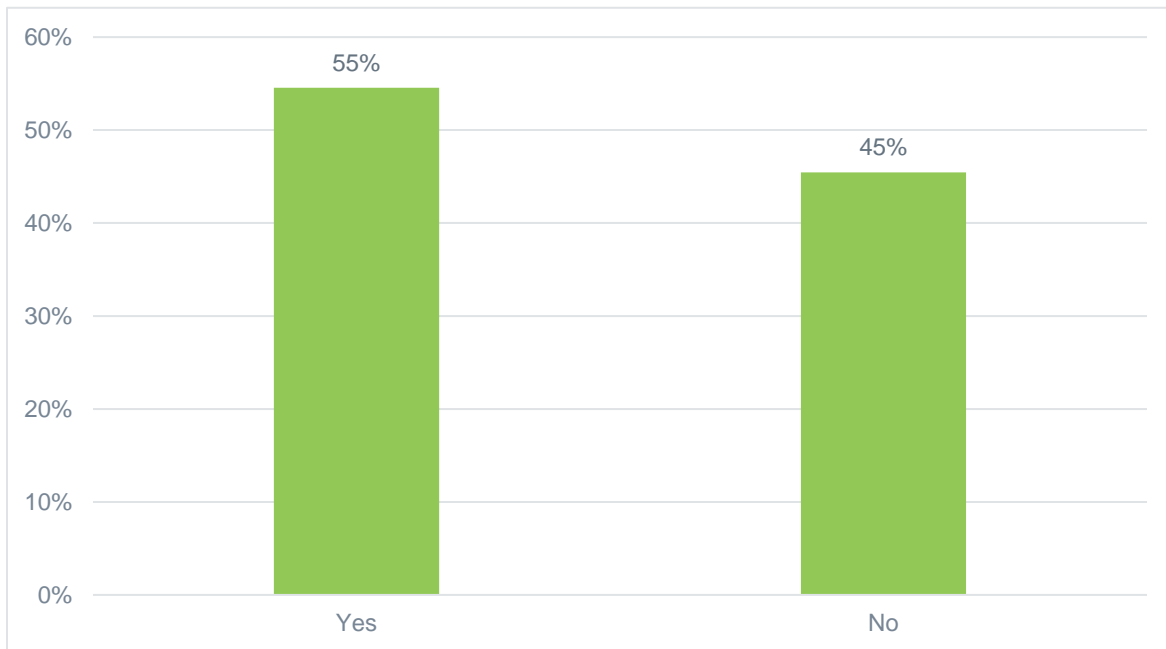
Almost 90% percent of respondents reported that they would not have purchased their clean vehicle without the CVA Program grant (Figure 13). When asked in more detail what they would have done instead, only 17% of respondents would have purchased a new or used clean vehicle.

**Figure 13. “Would you have purchased your clean vehicle if you did not receive a grant through the CVA Program?”**



Of the 33 respondents who received a loan through Beneficial State Bank (BSB), 45% of them would not have purchased their clean vehicle without the financing provided by BSB (Figure 14).

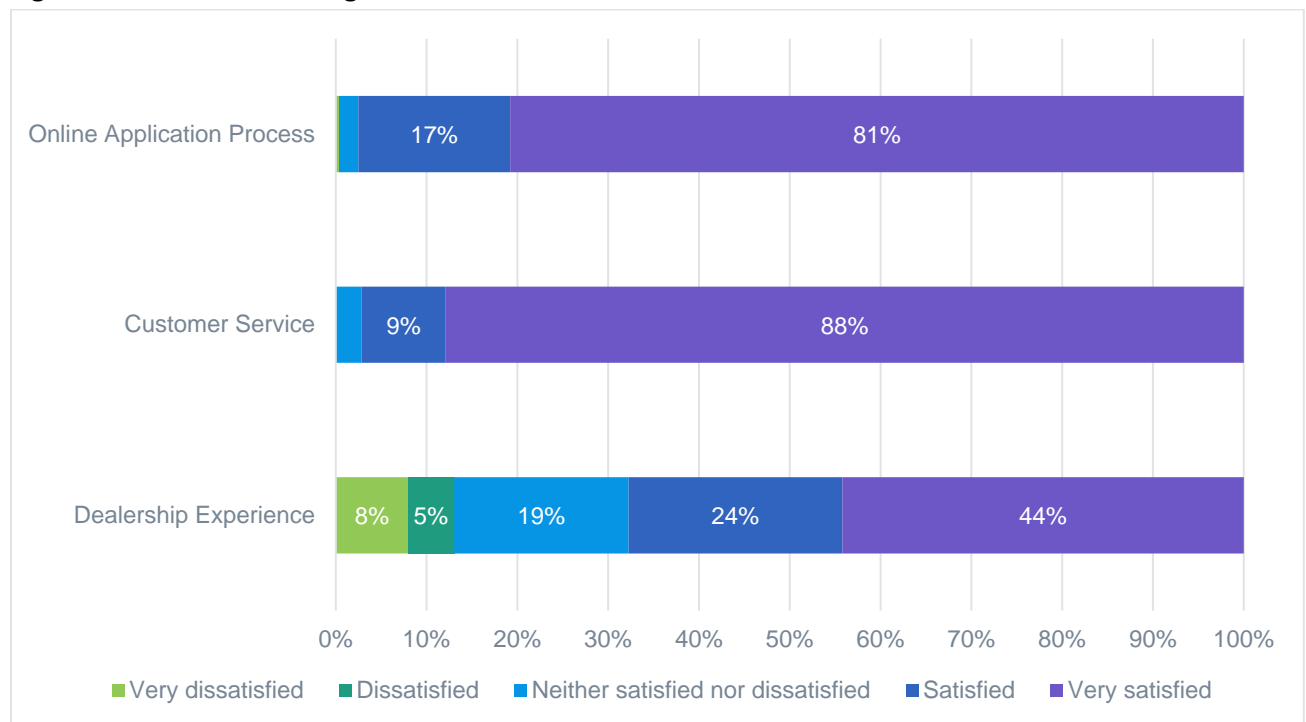
**Figure 14. “Would you have purchased your clean vehicle if you did not receive a loan through the Beneficial State Bank?”**



### Program Satisfaction

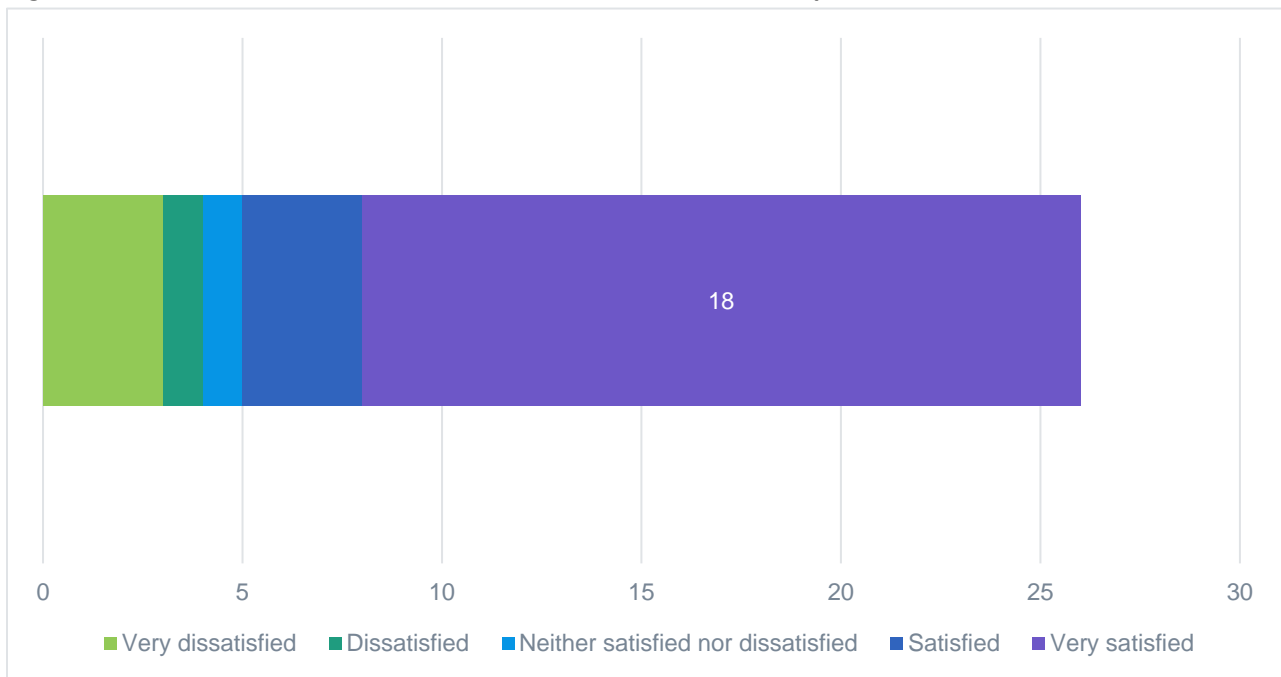
Satisfaction with the online application process and customer service has increased from 2019 to 2020. The share of respondents who were very satisfied with the online application process rose from 73% to 81%. Similarly, the share of respondents who were very satisfied with their customer experience rose from 77% to 88%. Ratings of the dealership experience were similar to those in 2019.

Figure 15. Satisfaction ratings





**Figure 16. Level of satisfaction with the Beneficial State Bank loan process**

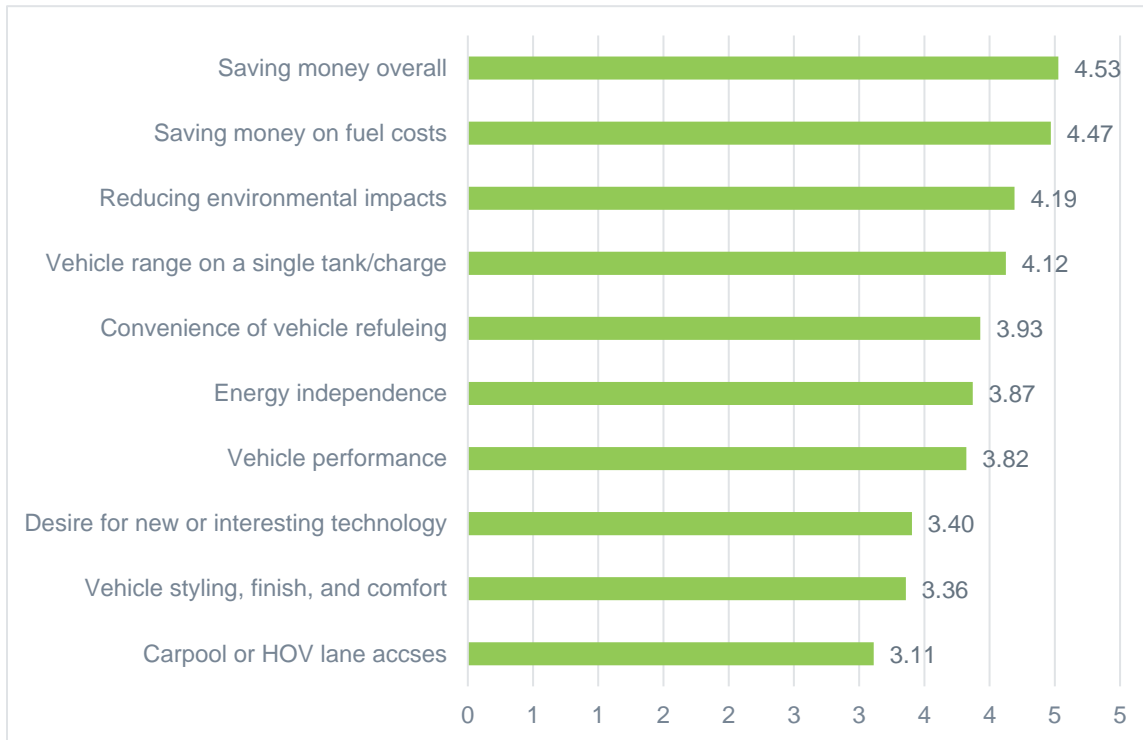


### **Primary Motivations for Adoption**

To understand participants' motivations for adoption, respondents were asked to rate how important several factors were in their decision to acquire their clean vehicle on a five-point scale. Responses were coded numerically (1=not at all important and 5=extremely important) so that average scores could be calculated.

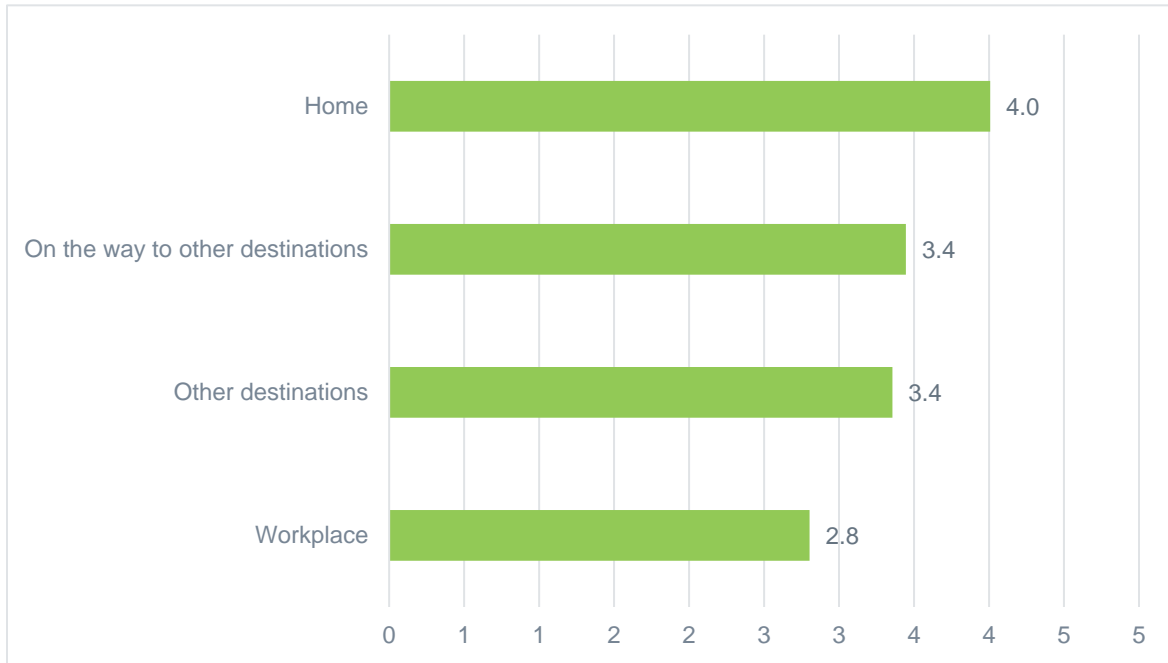
As shown in Figure 17, respondents indicated that saving money overall and saving money on fuel costs had the highest importance ratings. Reducing environmental impacts ranked just below saving money in terms of importance. Respondents considered access to HOV lanes to be the least important factor.

**Figure 17. Motivation for acquiring a clean vehicle**



Respondents who purchased a PHEV or a BEV were asked to rate how important the availability of charging at certain locations was to their decision to acquire their clean vehicle on a five-point scale (Figure 18). The availability of home charging had the highest average importance.

**Figure 18. “How important to your decision to acquire your plug-in electric vehicle was the availability of charging at each of the following locations?”**

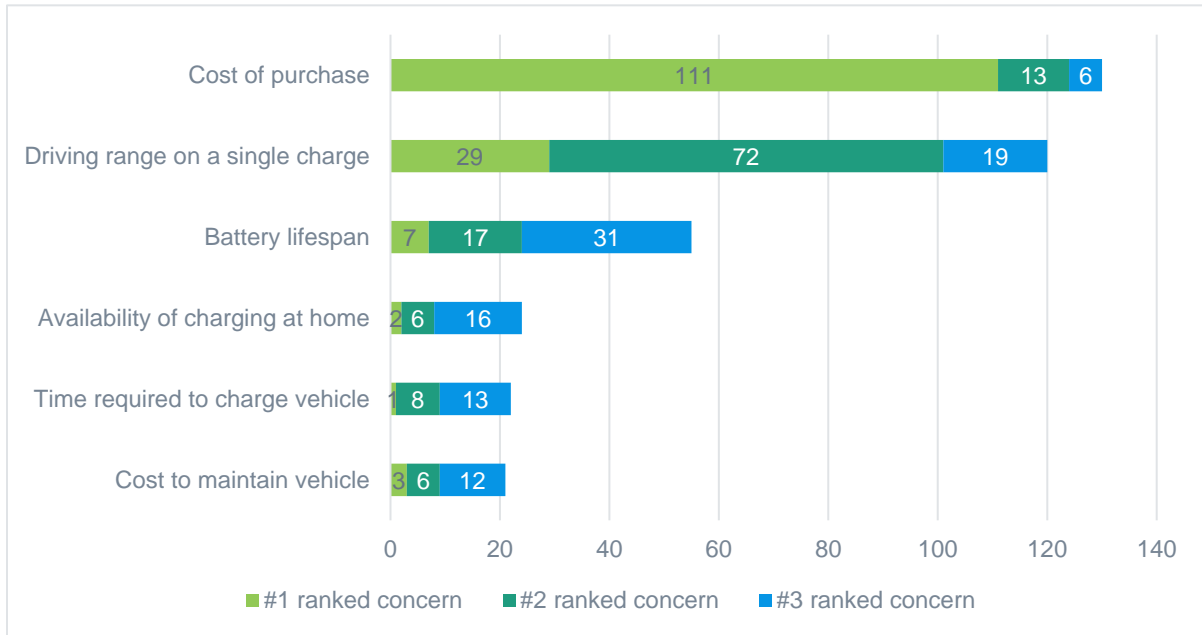


### Concerns for Adoption

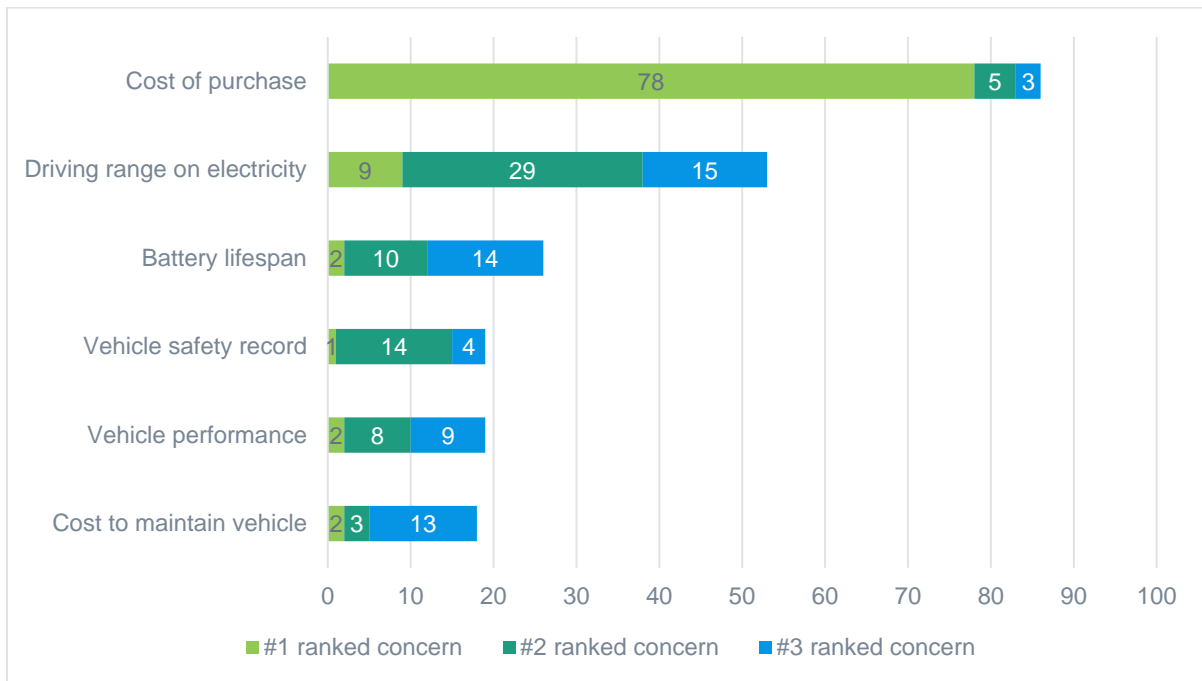
To understand program participants’ concerns regarding adopting an electric vehicle, survey respondents were asked to rank their top three concerns they had when shopping for their clean vehicle. Slightly different response options were shown to the survey respondents depending on their vehicle’s technology type. Figures 19 and 20 show the top 6 most frequently selected responses for BEVs and PHEVs, respectively.

Both BEV and PHEV respondents indicated that the cost of purchase, electric driving range, and battery lifespan were concerns. Not surprisingly, the time required to charge the vehicle was more of a concern for BEV than for PHEV drivers.

**Figure 19. “Which concerns did you have when you were shopping for your battery electric vehicle (BEV)?”**



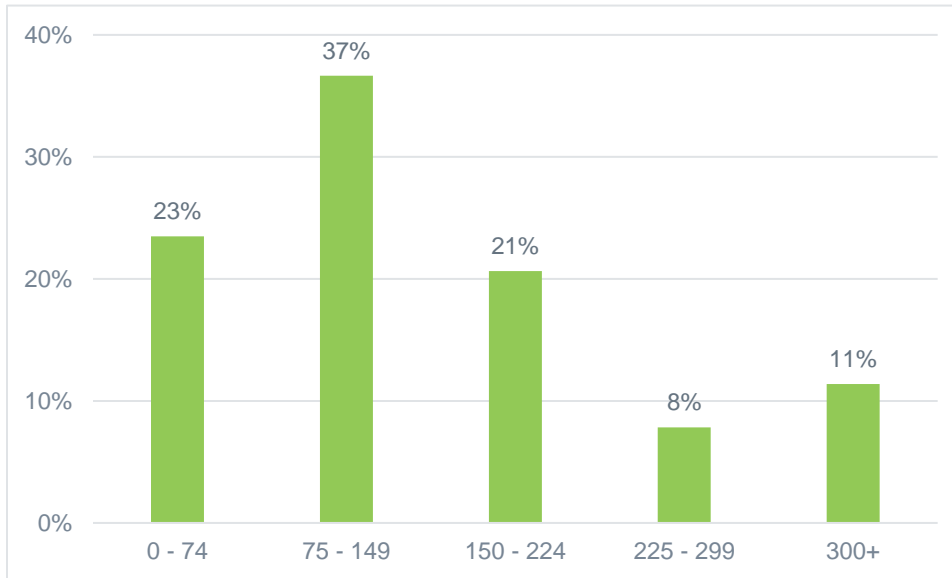
**Figure 20. “Which concerns did you have when you were shopping for your plug-in hybrid electric vehicle (PHEV)?”**



### Clean Vehicle Travel Behavior

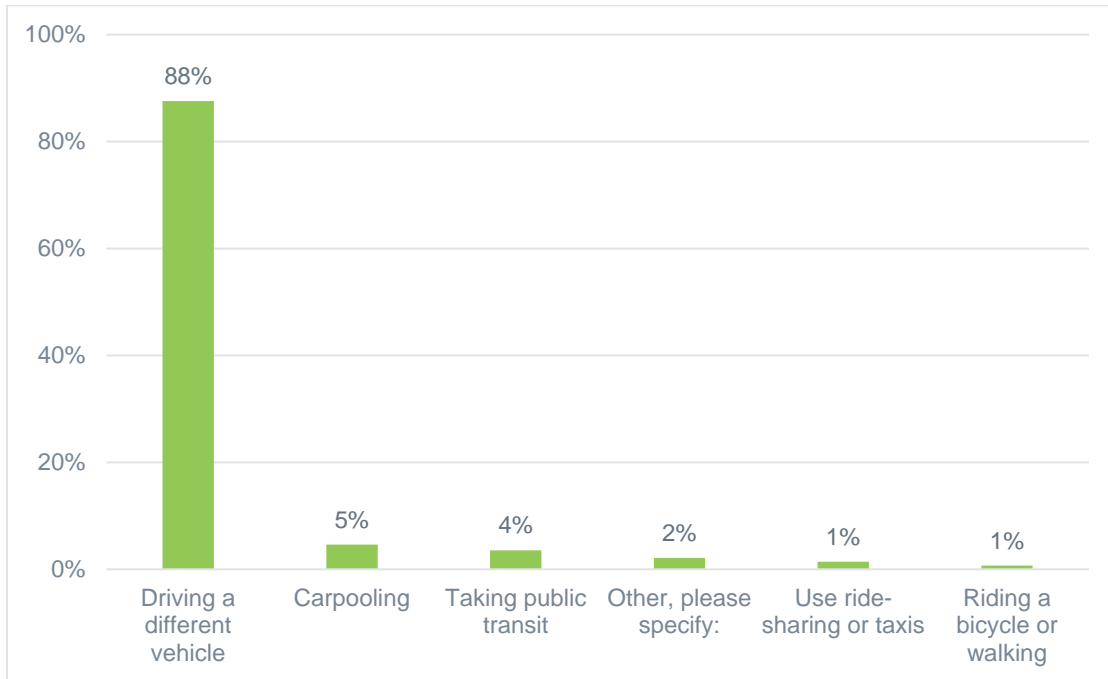
Respondents were asked to estimate the total number of miles that they drive their vehicles in a typical week. Sixty percent of respondents reported driving less than 150 miles per week, compared to 50% of respondents in the 2019 report.

**Figure 21. Estimated total miles driven in a typical week**



Respondents were asked to describe their previous and current modes of transportation. Figure 22 shows that 88% of respondents were previously driving a different vehicle to meet their travel needs prior to participating in CVA Program. After adopting a clean vehicle, 94% of respondents are now using their clean vehicle to meet their travel needs, indicating that access to a personal vehicle for meeting travel needs has increased for 6% of respondents.

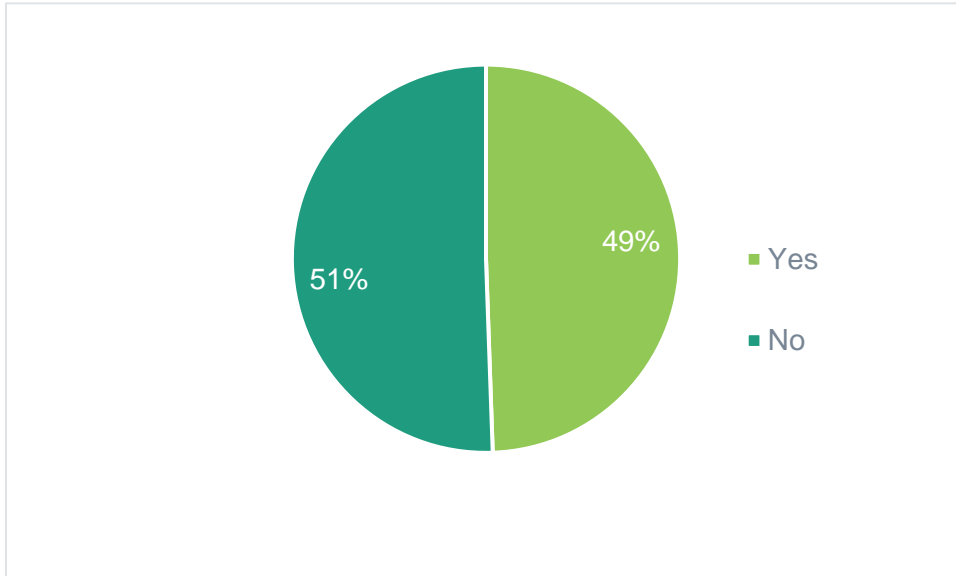
**Figure 22. “How did you most often get where you needed to go before you bought the clean vehicle?”**



### **Charging Behavior**

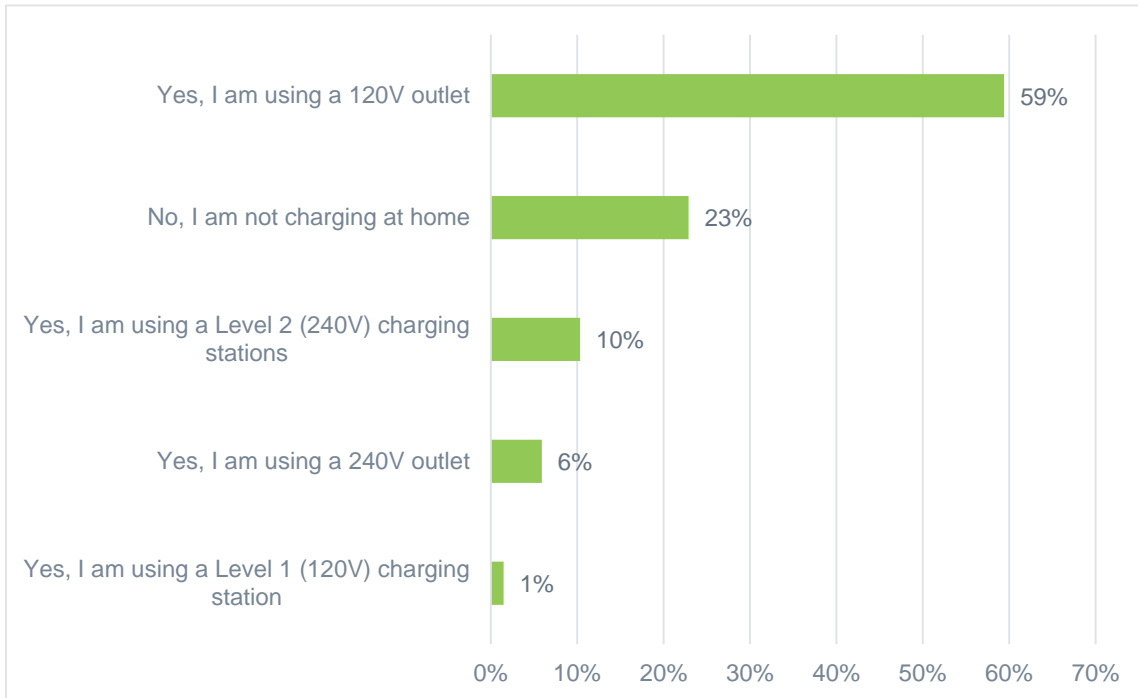
Respondents who purchased a PHEV or BEV were asked if they had received a charging grant or were in the process of getting one. As seen in Figure 23 almost half (49%) of respondents who purchased a PHEV or BEV have received or are in the process of receiving the charging grant.

**Figure 23. “Have you already received a Level 2 charging station through GRID Alternatives, or are you in the process of doing so?”**



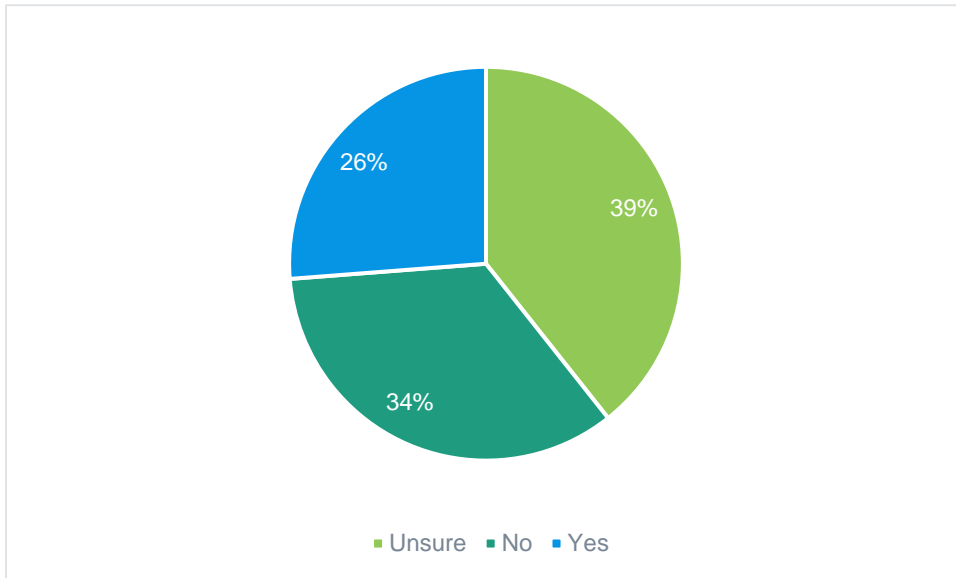
Almost 60% of survey respondents charge their plug-in electric vehicle at home using a 120V outlet (Figure 24). This proportion has not changed from the 2019 survey.

**Figure 24. Do you charge your plug-in electric vehicle at home?**



Of those who do not currently charge at home, about one fourth (26%) expect to be able to charge at home within the next year (Figure 25).

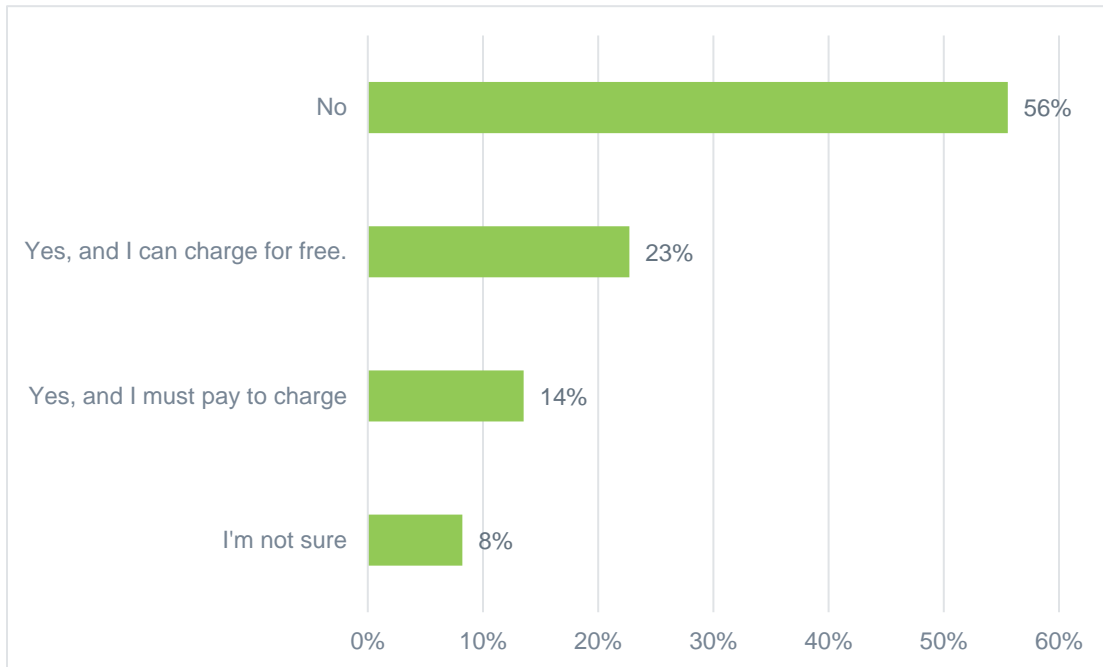
**Figure 25. Will you be able to charge at home within the next year?**



Respondents who purchased a BEV or PHEV were asked about the availability of charging at their workplace. Of those who work outside of the home, 56% reported that they do not have charging available at their workplace. Twenty-three percent had free charging available at work, and 14% must pay to charge at work.



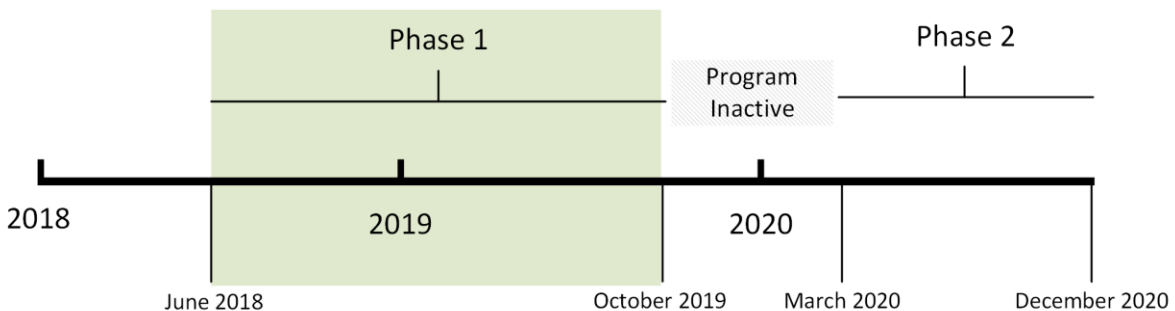
**Figure 26. When you get to work is there somewhere you can charge your plug-in electric vehicle?**



Note: does not include 62 respondents who do not work or work from home

## Ownership Survey – Phase 1

**Figure 27. Respondents included in ownership survey results**



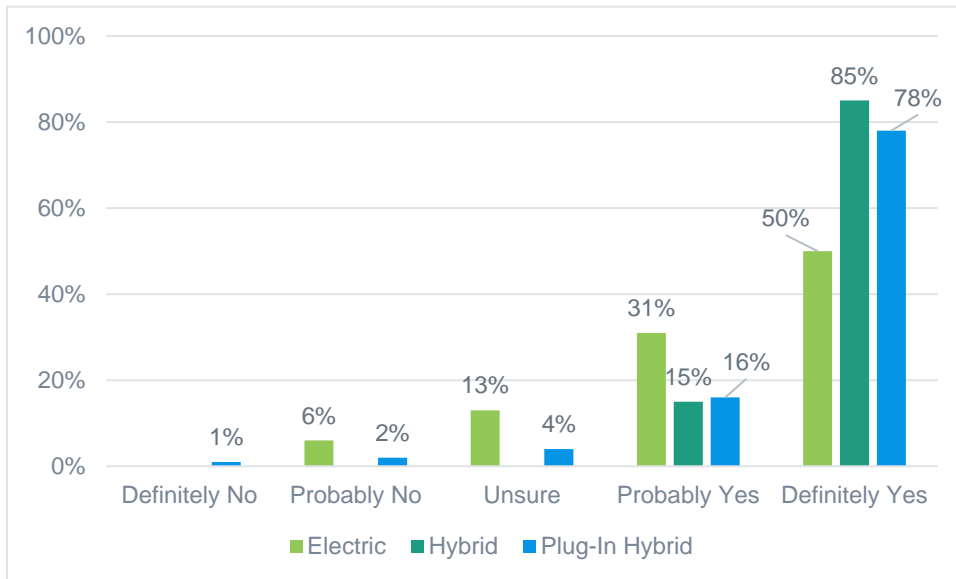
The ownership survey is administered to participants who have owned their clean vehicle for at least one year. At the time of this report, only participants from phase 1 have received the ownership survey, as shown in Figure 27.

### Overall EV Experience

Of the 168 respondents to the ownership survey, 97% of them still own their vehicle. To understand respondents overall experience with their vehicle we asked whether they would recommend their

vehicle to their friend. Over 90% of respondents indicated either “probably yes” or “definitely yes” to this question (Figure 28). However, BEV respondents were significantly ( $p < 0.05$ ) less likely to indicate that they would recommend their vehicle to their friend with approximately 80% indicating they would recommend versus about 95% of PHEV respondents and 100% of HEV respondents.

**Figure 28. Would you recommend your current vehicle to a friend looking for a new car?**



### Program Satisfaction

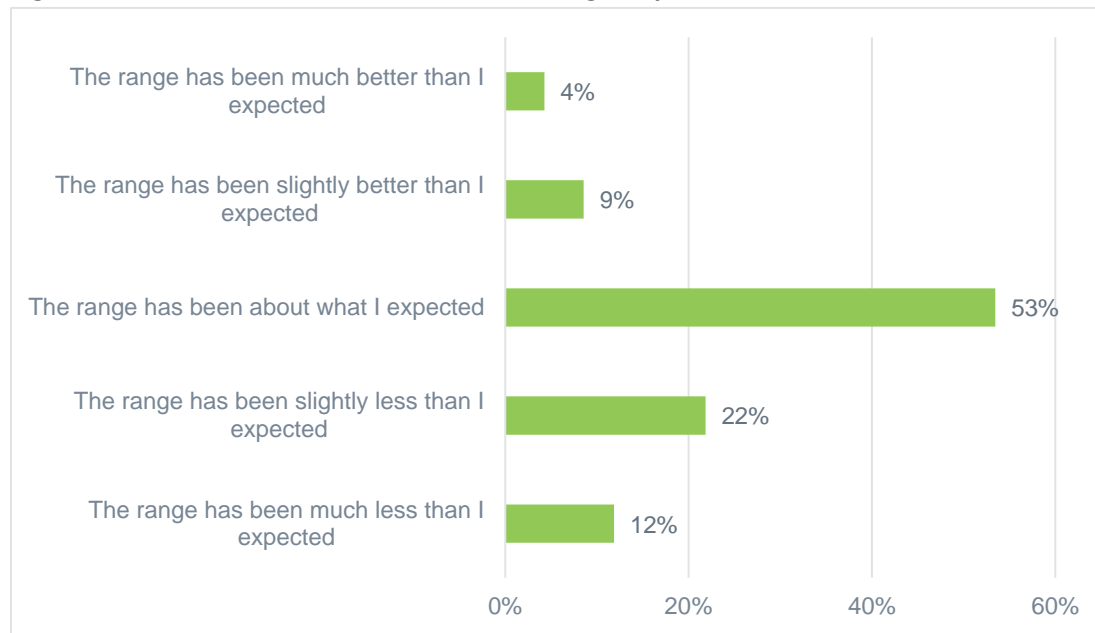
Ownership survey respondents were asked “On a scale of 0-10, how likely are you to recommend the Clean Vehicle Assistance Program to a friend?” This measure of customer satisfaction complements the questions asked in the adoption survey, which asked about more specific categories (e.g. satisfaction with customer service).

An overwhelming majority of respondents (95%) selected 10 out of 10, resulting in an average score of 9.9.

### Transportation Habits and Needs

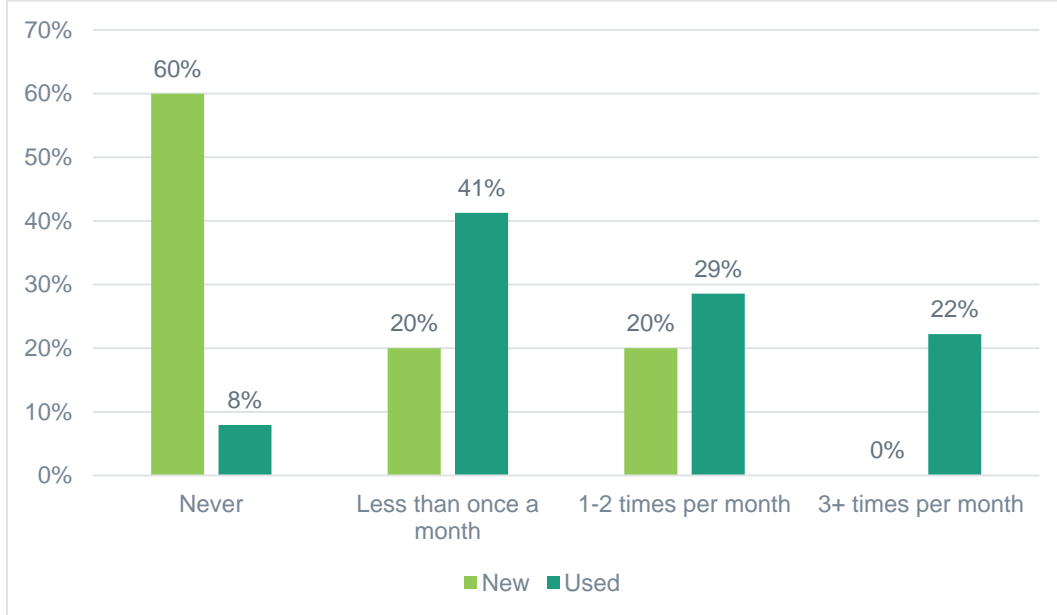
The degree to which the respondent's expectations of the range of their vehicle matched their actual was mixed (Figure 29). Over half of respondents indicated that the range was about what they expected. That said, less than 15% of respondents indicated that the range was better than expected. While PHEVs include an internal combustion engine and therefore are not limited by the range of their battery, there was no statistically significant difference between BEV and PHEV respondents for this question.

**Figure 29. Which best describes the electric range of your vehicle?**



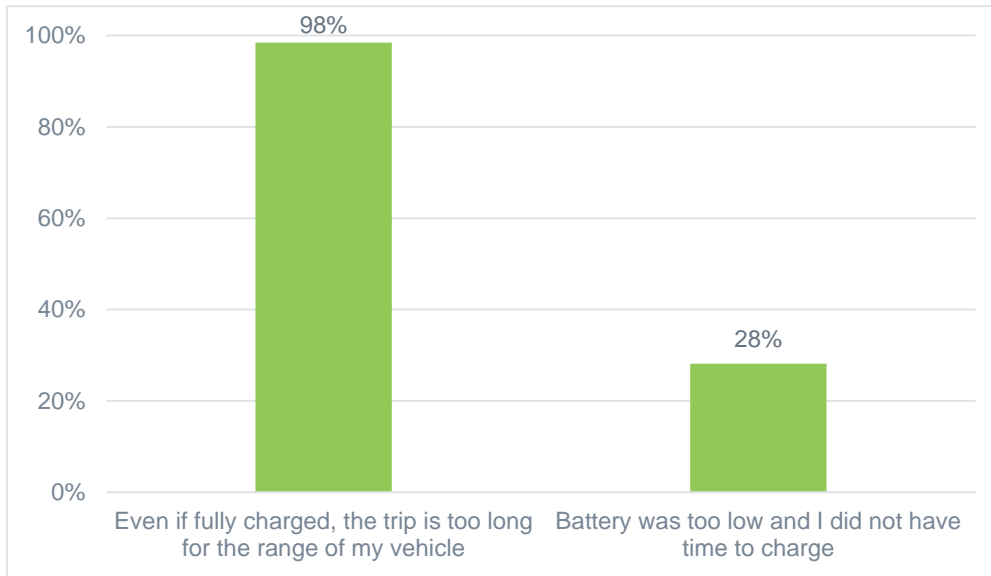
To improve our understanding of BEV respondents' satisfaction with the range of their vehicle we asked how often the range of their vehicle was insufficient for a trip that they wanted to take. Overall, only 13% of respondents always had enough range to take their desired trips. However, range constraints varied drastically between new and used vehicles. Ninety-two percent of respondents who purchased a used BEV reported that they have insufficient range for a desired trip at least occasionally (Figure 30). In contrast, 60% of respondents who purchased a new BEV reported that they have never been unable to take a trip with their BEV due to insufficient range.

**Figure 30. How often have you wanted to drive somewhere but did not have enough range with your vehicle?**



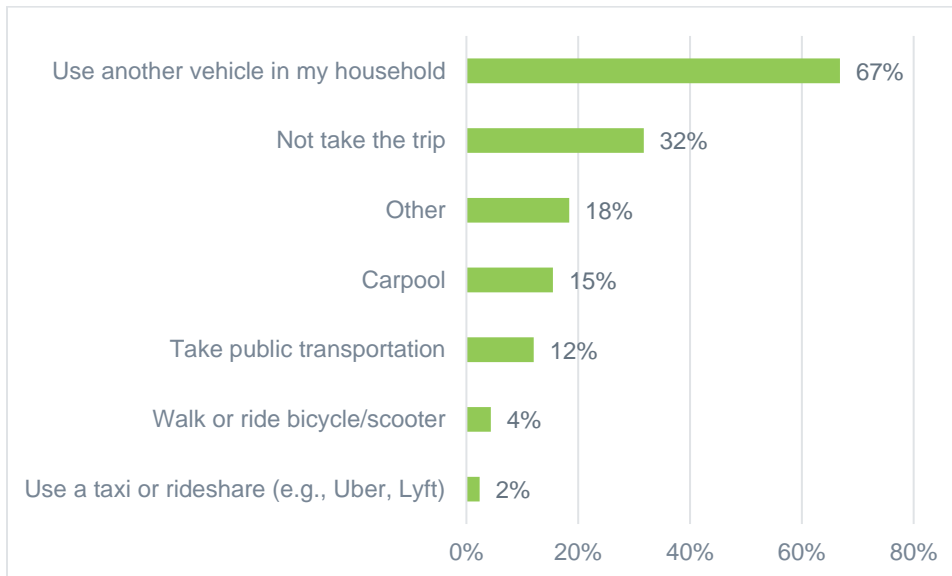
The BEV drivers who found their vehicle’s range to be insufficient on one or more occasions were asked a follow up question about why they have been unable to take a trip in their BEV. Almost all (98%) had wanted to take at least one trip that was too long for the range of their vehicle on a single charge. However, only about one quarter (28%) of these respondents had been unable to take a trip due to a low charge on their battery. These findings indicate that BEV range is often a limitation for long trips but rarely a limitation due to unexpected shorter trips or forgetting to charge the vehicle.

**Figure 31. Which of the following have prevented you from using your vehicle?**



Respondents were also asked how they responded to situations where they could not use their electric vehicle for a trip (Figure 32). Nearly 70% indicated that they sometimes used another vehicle in the household and approximately 30% indicated that they did not take the trip. Six respondents who selected “other” wrote in that they rent a vehicle when they need to take a long trip.

**Figure 32. When you are unable to use your vehicle for a trip, what did you do?**

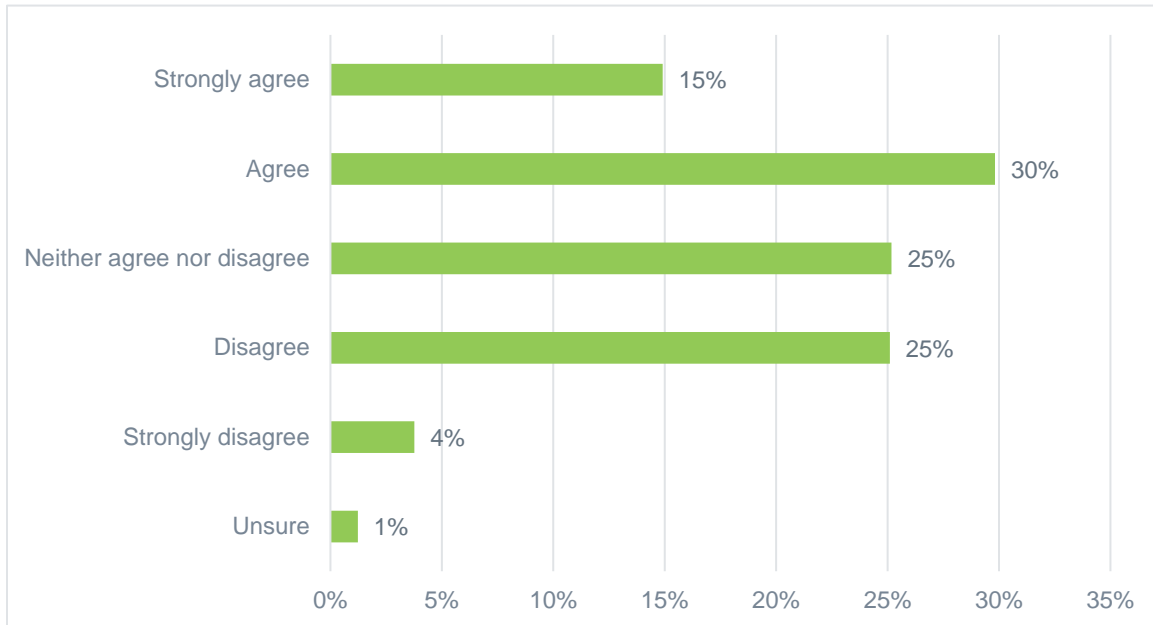


### Charging Experience

Respondents were asked how much they agree or disagree with three statements related to the convenience of charging their vehicle (Figures 33-35).

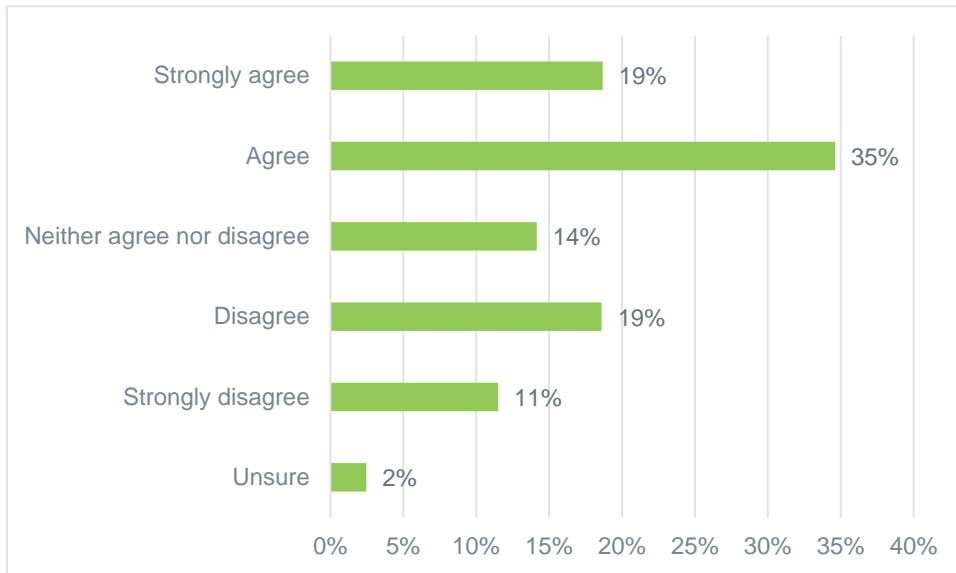
Figure 33 shows respondents' satisfaction with the length of time it takes to charge their vehicle. Approximately 45% of respondents indicated that it took too long to charge their vehicle. The responses did not differ significantly between BEV and PHEV respondents (not shown).

**Figure 33. "It takes too long to charge my plug-in electric vehicle"**



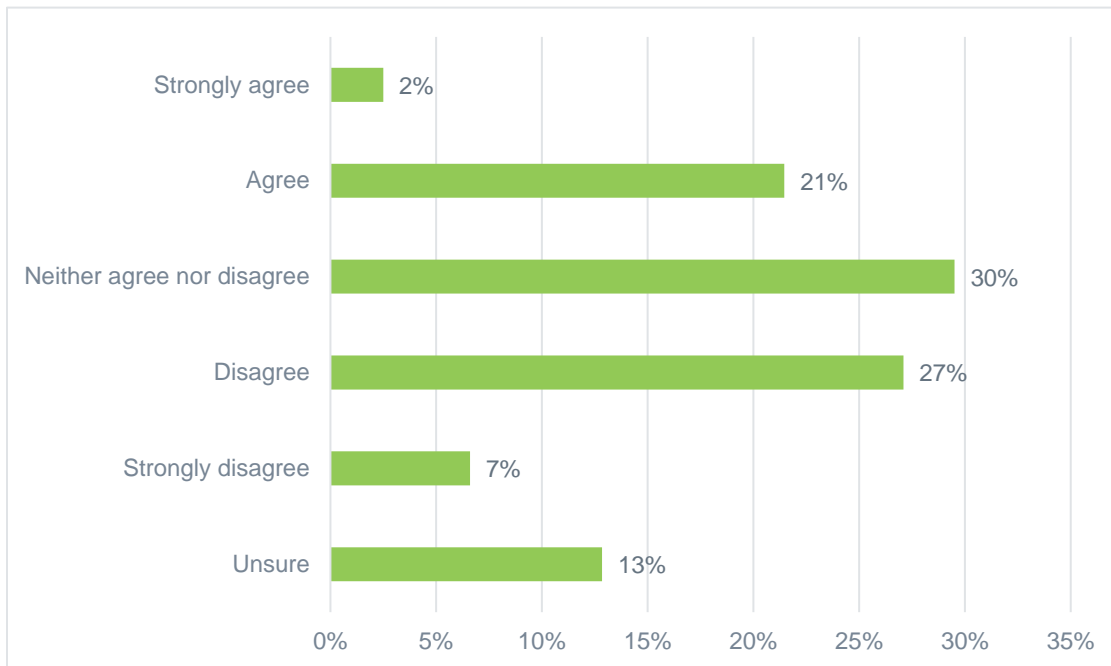
To understand whether charging options were sufficient, we asked respondents their level of confidence in the availability of appropriate charging options when they needed to charge (Figure 34). Respondents were split with approximately 50% indicating that they were confident whereas about 30% indicated they were not. The responses did not differ significantly between BEV and PHEV respondents (not shown).

**Figure 34. "I am confident that I can charge my plug-in electric vehicle whenever I need to"**



We also gauged respondents' confidence in the status (i.e., working or not working) of chargers away from home. Respondents were split on their opinion with approximately 25% agreeing that they were "often not working" and approximately 35% disagreeing (Figure 35).

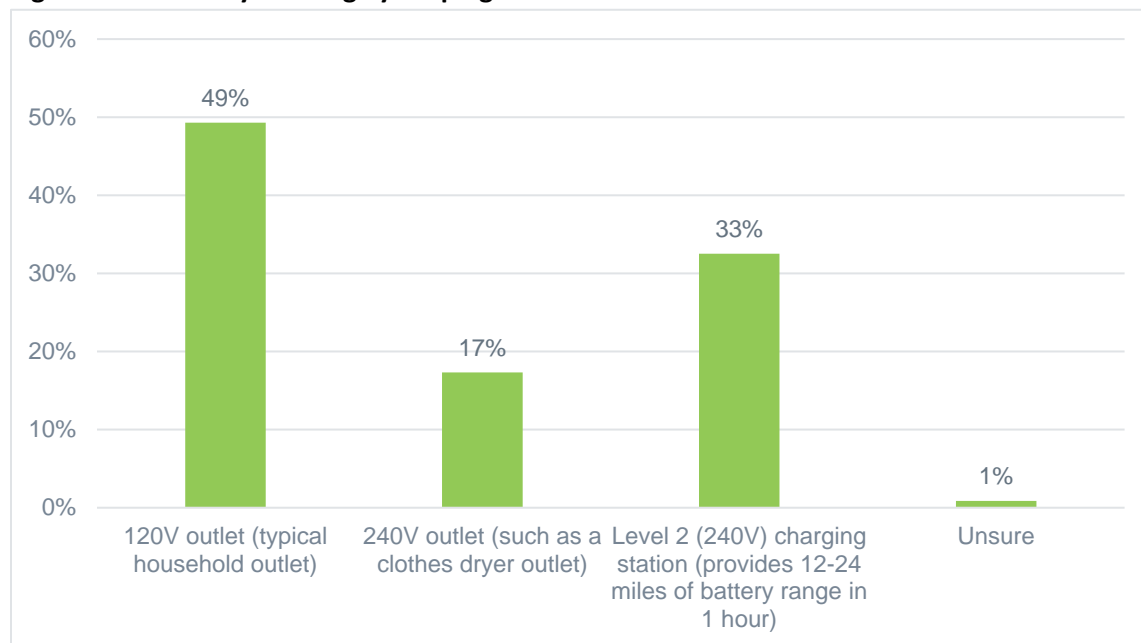
**Figure 35. "Charging stations away from home are often not working"**



Respondents that charge their vehicles at home were asked about their charging method (Figure 36). Nearly 50% of the respondents indicated that they charge their vehicle with an 120V outlet and nearly 50% charge with a 240V outlet.

Only 18 respondents who drive a BEV or PHEV reported that they do not charge at home. When asked why they do not charge at home, 14 reported that they do not have a place to charge at home. Of the remaining four, two respondents reported that they do not have enough electrical capacity at home to charge their vehicle.

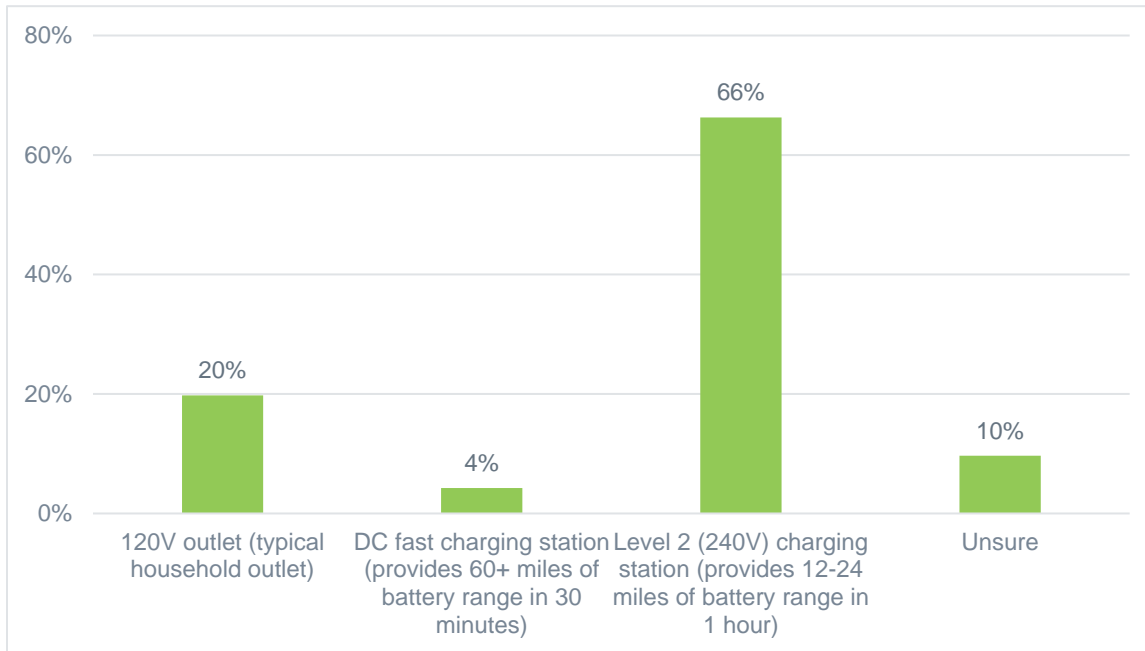
**Figure 36. How do you charge your plug-in electric vehicle at home?**



Among respondents with workplace charging, approximately 78% indicated that the charging is free. Respondents that take advantage of workplace charging were asked about their workplace charging station (Figure 37). Approximately 65% of these respondents indicated that at their workplace they use a level 2 charger (240V), 20% use a 120V outlet and 5% use a DC fast charger.

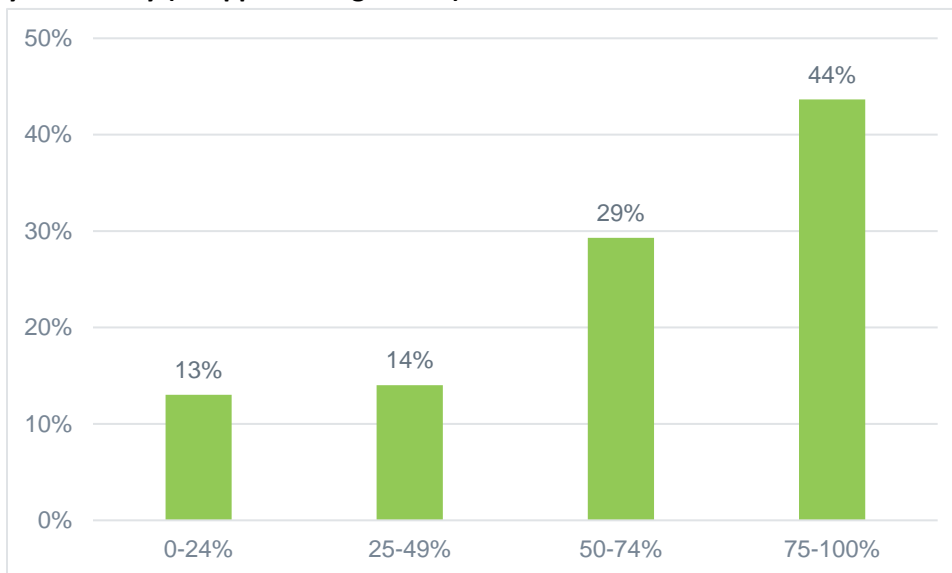


**Figure 37. How do you charge your plug-in electric vehicle at work?**

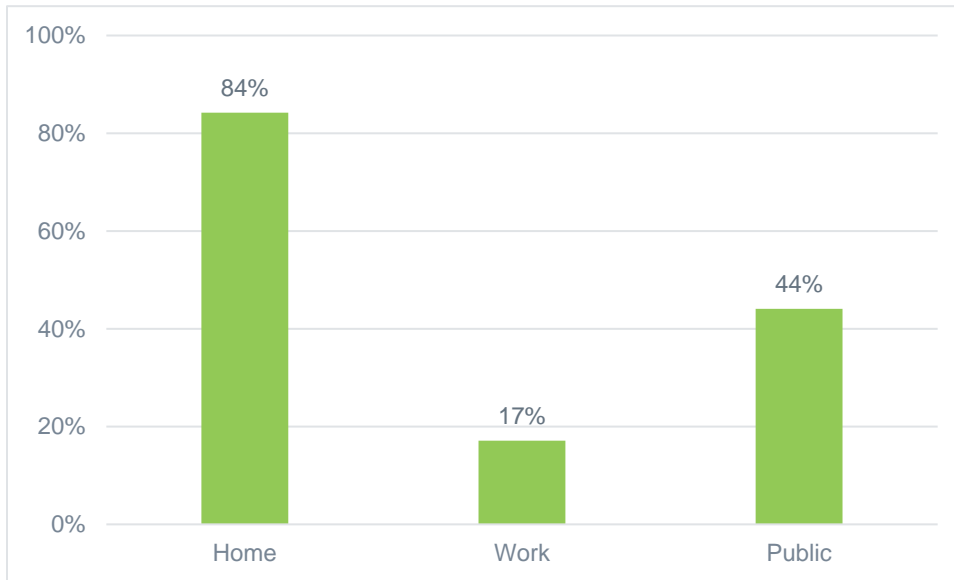


Program participants who purchased a PHEV were asked to estimate what percent of the time they have driven using electricity rather than gasoline. Almost three quarters (73%) are driving on electricity more than 50% of the time. This indicates that most PHEV drivers are charging their vehicle regularly and few, if any, are driving their PHEV as if it were a conventional hybrid.

**Figure 38. "In the last three months, what percent of the time have you driven using electricity from your battery (as opposed to gasoline)?"**

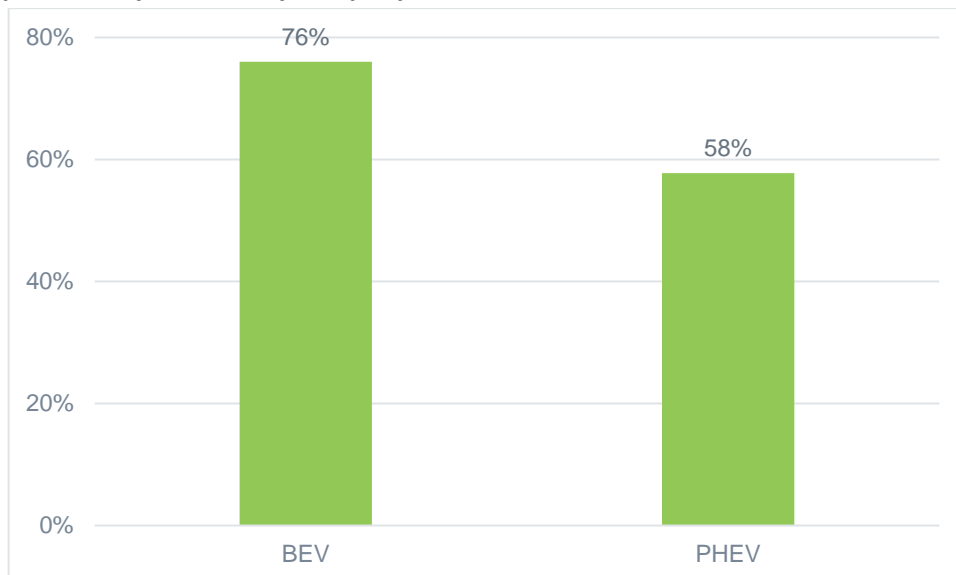


**Figure 39. In which locations do you charge your plug-in electric vehicle?**

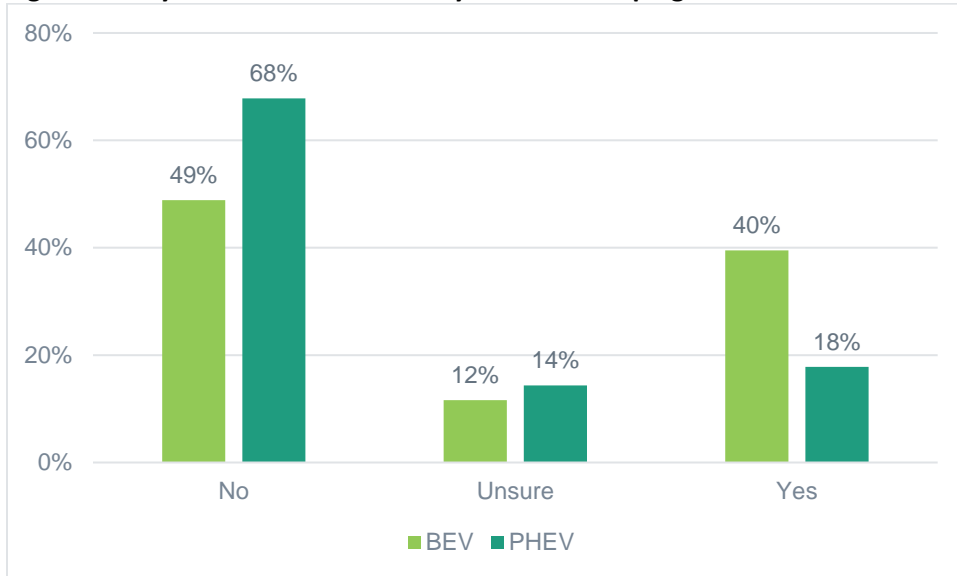


Respondents were asked whether they were aware of special plug-in EV electricity rates provided by their utility and whether they were enrolled in such rates. Figure 40 shows that awareness of special electricity rates for EV owners is significantly higher among BEV respondents than PHEV respondents ( $p < 0.05$ ). This increased awareness corresponded to increased usage, with BEV respondents being significantly ( $p < 0.05$ ) more likely to be enrolled in EV rates than PHEV respondents (Figure 41).

**Figure 40. Percent of respondents who are aware of special plug-in electric vehicle electricity rates provided by their utility company**



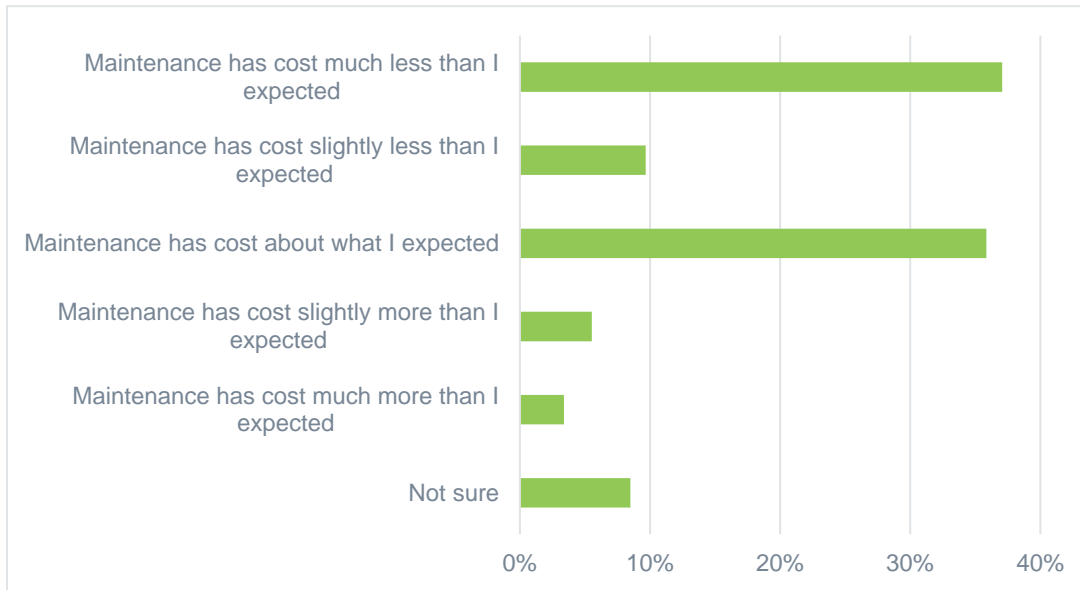
**Figure 41. Is your household currently enrolled in a plug-in electric vehicle electricity rate?**



### Running Costs

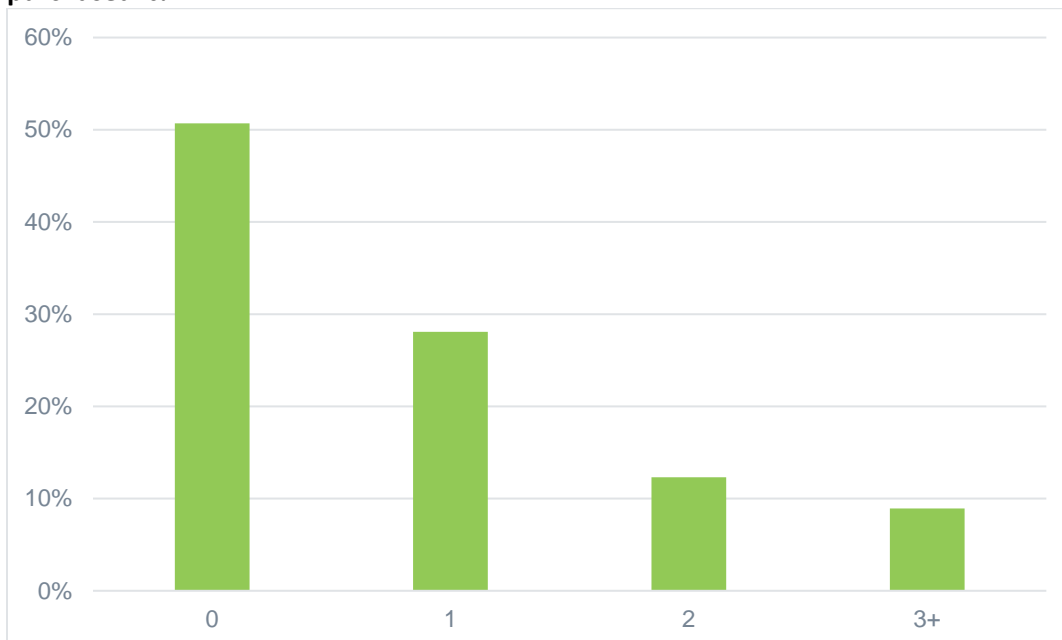
The degree to which the respondent's expectations of the maintenance costs of the vehicle corresponded to the actual costs was also evaluated. Nearly 50% of respondents indicated that maintenance costs were less than expected and less than 15% indicated that maintenance costs were more than expected (Figure 42). There was no statistically significant difference between BEV and PHEV respondents for this question (not shown).

**Figure 42. Which best describes the maintenance cost of your vehicle?**



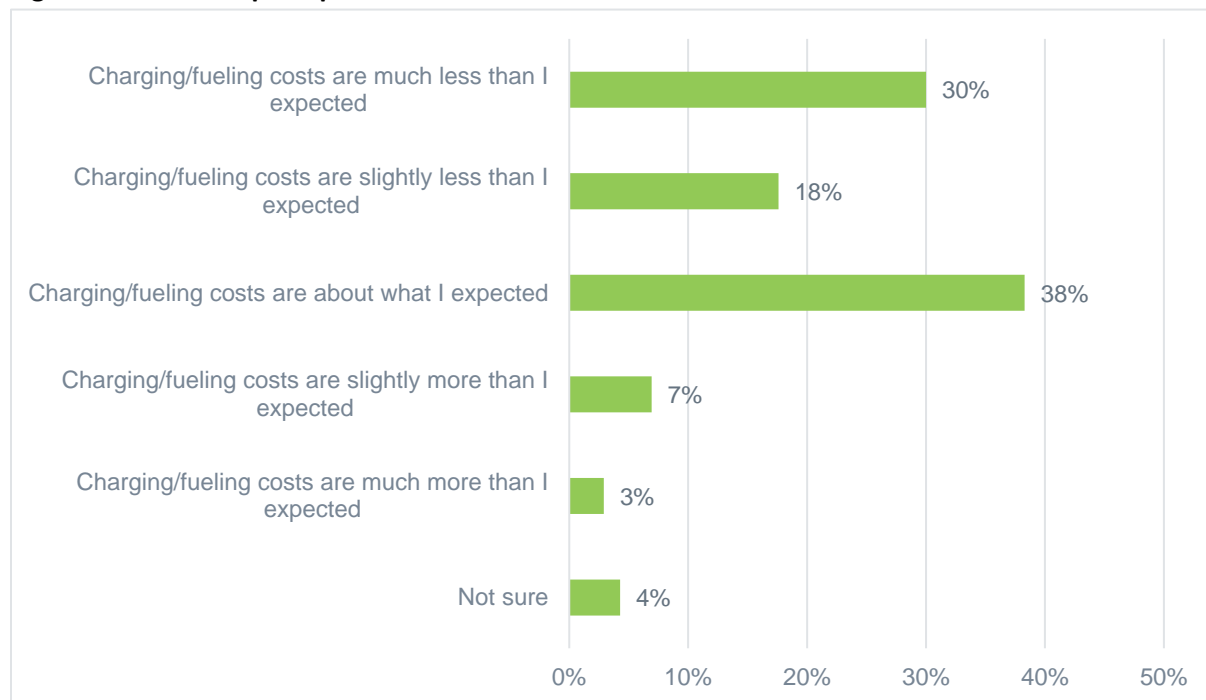
About half of respondents indicated that their vehicle has not required maintenance since purchasing the vehicle. However, about 25% of owners have taken their vehicle to the mechanic multiple times since purchasing it. There was no statistically significant difference between maintenance history by vehicle type or by whether the vehicle was purchased new or used (not shown).

**Figure 43. How many times have you needed to take your vehicle to the mechanic since you purchased it?**



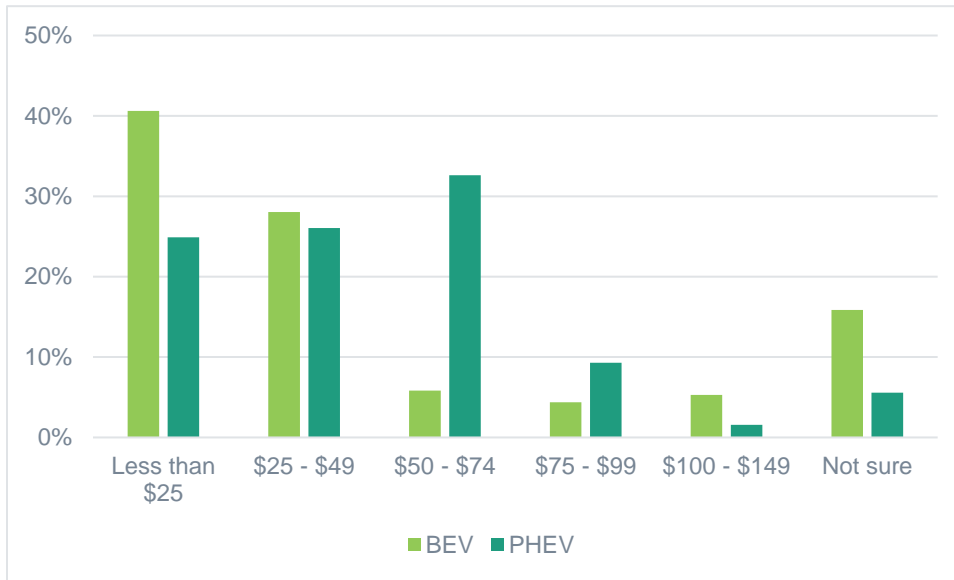
We also asked a question to understand respondents' expectations of fuel costs relative to the actual fuel costs of their vehicle. Nearly half of respondents indicated that fuel costs are less than they had expected and only 10% indicated that they are more than expected (Figure 44). The responses did not differ significantly across BEVs, PHEVs and HEVs (not shown).

**Figure 44. Fuel cost perceptions**



Respondents were also asked to estimate their average monthly fuel costs. Responses varied significantly ( $p < 0.001$ ) across vehicle types, with nearly 70% of BEV respondents indicating they spend less than \$50 per month on fuel. On the other hand, only about half of PHEV respondents and less than 25% of HEV respondents spend less than \$50 per month on fuel. When comparing across technology types, HEV respondents were dropped due to their small sample size.

**Figure 45. How much do you spend monthly on charging/fueling your vehicle?**



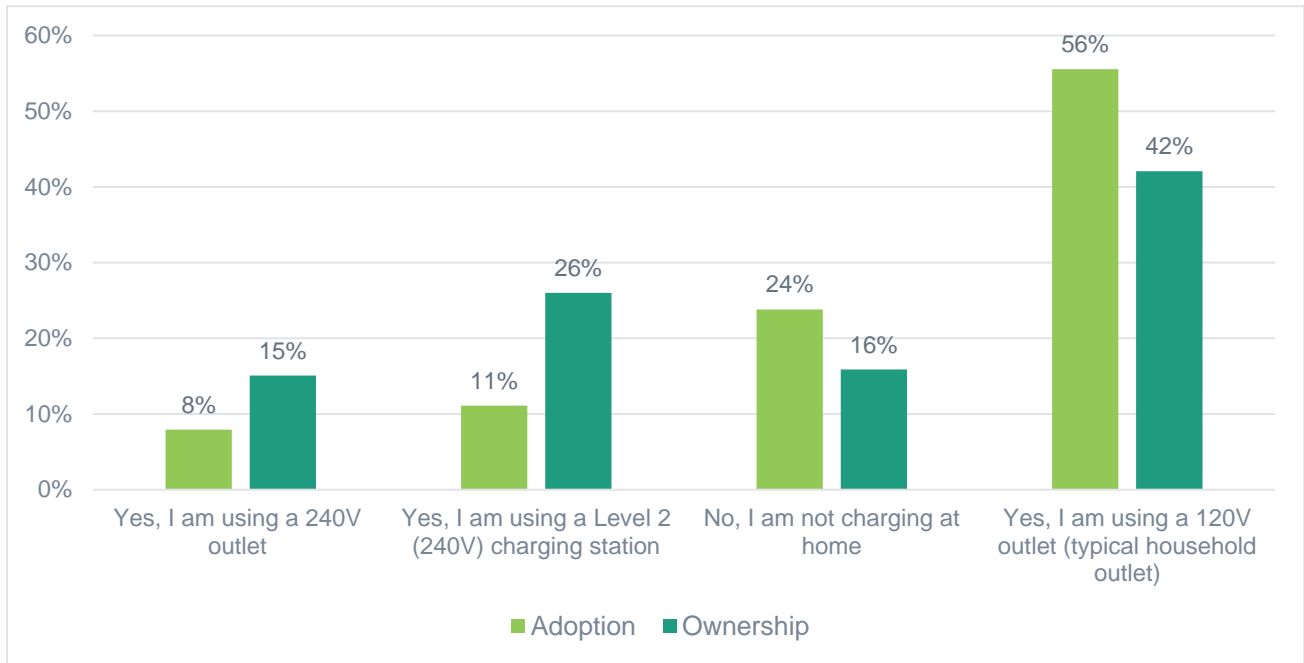
### Comparison with 2019 Adoption Survey

Respondents who purchased a PHEV or BEV were asked about how they are charging at home in both the adoption and ownership surveys. Figure 46 shows the responses for 126 individuals who answered these questions in both surveys.<sup>2</sup> Figure 46 shows a trend towards more home charging over time with the percent of respondents who do not charge at home decreasing from 24% to 16%. Further, usage of Level 2 chargers at home more than doubled from 11% to 26%.

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<sup>2</sup> The adoption survey gave the option to select “Level 1 (120V) charging station.” Only two respondents selected this option; therefore, it was removed from the ownership survey. Those two respondents are grouped with those who are using a 120V outlet in Figure 43.

**Figure 46. How respondents are charging at home**



## VI. Discussion

### Adoption Survey – Phase 1 & 2

The CVA Program has a goal of making “environmentally-friendly vehicles accessible and affordable to all”, and it has been very successful in reaching a broad demographic cross-section. Incentive programs that include used EVs are rare and therefore the CVA Program is setting a standard for participant diversity in this type of program. While not directly comparable given that it does not include used vehicles, data from the Clean Vehicle Rebate Program (CVRP) provides a snapshot of the demographics that have been reached by the new EV market in the past<sup>3,4</sup>. Key differences between the demographics reached by the two programs include gender, age, and education level. Race and ethnicity data were not available for the 2016-2017 CVRP survey.

<sup>3</sup> The most recent available CVRP data is from the 2016-2017 survey:

[https://cleanvehiclerebate.org/sites/default/files/attachments/CVRP\\_FY2015-16\\_FinalReport.pdf](https://cleanvehiclerebate.org/sites/default/files/attachments/CVRP_FY2015-16_FinalReport.pdf)

<sup>4</sup> [https://cleanvehiclerebate.org/sites/default/files/attachments/CVRP\\_FY2015-16\\_FinalReport.pdf](https://cleanvehiclerebate.org/sites/default/files/attachments/CVRP_FY2015-16_FinalReport.pdf)

Historically, EV adoption has skewed toward males, making up 73% of CVRP respondents in 2016-2017. The CVA Program has had a more balanced gender ratio, with only 58% of survey respondents being male. Participants in the CVA Program were also younger than those in CVRP. Only 24% of CVRP survey respondents are under 40, versus 50% of CVA Program survey respondents.

The education levels among CVRP survey respondents more closely match the California population as a whole. Among CVA Program survey respondents 15% have a postgraduate degree, versus 13% among Californians over the age of 25.<sup>5</sup> In contrast, among CVRP survey respondents 48% had a postgraduate degree. These demographic differences illustrate that the CVA Program is providing an important complement to CVRP by making EVs accessible to a more diverse group of consumers.

### **Adoption Survey – Phase 2**

This report summarizes adoption survey results from participants who purchased their vehicles in 2020. The results indicate that the CVA Program continued to be very impactful, with almost 90% of respondents saying that they would not have purchased their clean vehicle without the grant.

Like the 2018-2019 survey results, saving money overall was the highest-rated motivation for purchasing a clean vehicle. The cost of the vehicle was also the most frequently cited concern. The second and third ranked concerns for BEV and PHEV owners were the electric range and battery lifespan, respectively.

### **Ownership Survey – Phase 1**

Overall, the survey results suggest that program participants are satisfied with the vehicle they purchased with a vast majority of respondents indicating that they would recommend their vehicle to a friend. Indeed, many respondents indicating that they had underestimated how much that their vehicle would save them on fuel and maintenance costs.

Vehicle range is a limitation for many respondents. Over one-third of BEV and PHEV drivers indicated that their vehicle had less range than expected and 87% of BEV drivers reported that they had ever been unable to use their vehicle for a trip because of a lack of range. However, the longer range of newer BEV models appears to be alleviating range limitation for many drivers. Among respondents who purchased a new BEV, only 40% had ever been unable to use their vehicle due to insufficient range. Those respondents were evenly split between being unable to use their vehicle “1-2 time per month” and “less than once a month.” No respondents who purchased a new BEV selected “3+ times per month.”

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<sup>5</sup> ACS 2019 1-year estimates.

<https://data.census.gov/cedsci/table?q=Educational%20Attainment&g=0400000US06&tid=ACSST1Y2019.S1501&hidePreview=false>



When asked about the speed of charging their vehicle, responses from PHEV and BEV drivers indicate that there is room for improvement. Almost half (45%) agree with the statement “it takes too long to charge my vehicle.” Charging away from home received better reviews: only 30% are not confident that they can charge whenever they need to, and only 23% agree that charging stations away from home are often not working.

The findings from both the adoption and ownership surveys show that a large majority of CVA Program participants had a positive experience with the program and are pleased with their vehicle. However, they do highlight remaining barriers to EV adoption, including cost, range limitations, and charging speed.