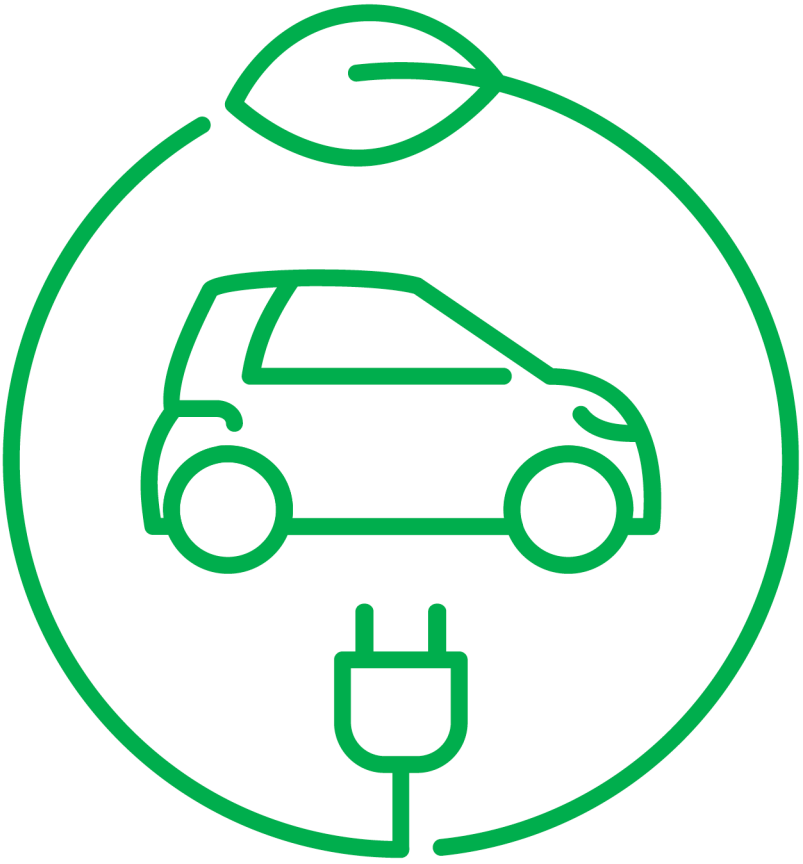
REPORT

Battery Electric Vehicles & Low Carbon Fuel Survey

A Nationally Representative Multi-Mode Survey



Prepared by
CR Survey Research Department

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CR Consumer Reports®

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INTRODUCTION

In January/February 2022, Consumer Reports conducted a nationally representative multi-mode survey. The purpose of the survey was to gauge Americans' perspectives and concerns regarding the transportation industry's impact on the environment and their willingness to make environmentally-friendly transportation choices. The survey measured Americans' knowledge and experiences with electric-only vehicles, their likelihood of getting one, and their perceptions about barriers preventing and incentives that would encourage them to get a battery-only electric vehicle. The survey also assessed Americans' awareness about low carbon fuel usage in vehicles and aviation and their willingness to use low carbon fuels in their personal vehicle as well as choose flights that use low carbon fuels, when they become available. NORC at the University of Chicago administered the survey through its AmeriSpeak® Panel to a nationally representative sample of 8,027 adult U.S. residents.

HIGHLIGHTS

EV Ownership

- Only **two percent** of Americans **currently have a battery electric vehicle (BEV).**
- Three percent have had one in the past.
- A larger percentage of **current EV owners (51%)** than past EV owners (36%) or those who have never owned an EV (26%) say **reducing their impact on the environment is one of the most important factors** to them if they were to buy or lease a vehicle today.

Likelihood of Buying/Leasing a Battery-electric Vehicle

- **Fourteen percent** of Americans say if they were to buy or lease a vehicle today, they **would definitely buy or lease an electric-only vehicle.** Twenty-two percent would seriously consider one, 35% might consider one, and **28% would not consider getting an electric-only vehicle.**
- Only **9% of Americans** say they are **'very' familiar with the fundamentals of owning an electric-only vehicle.**
- The top three barriers to purchasing or leasing an electric-only vehicle are **charging logistics** (61%), the **number of miles the vehicle can go before it needs to be charged** (55%) and the **costs** involved with buying, owning, and maintaining an EV (52%).
- On the other hand, **cost-related factors** are the **most desirable attributes** of an EV:
    - **About three in 10 Americans** say **"costs less to charge** than fueling a gas-powered vehicle" (33%) , "**lower overall costs over the lifetime of the vehicle** compared to a gas-powered vehicle" (31%), and "**lower maintenance costs** than a gas-powered vehicle" (28%) are the attributes that would most encourage them to get an EV.

- Nearly half of Americans **(46%) have not heard about any incentives available for electric-only vehicle owners.**
    - About half of Americans say "tax rebates/discounts at the time of purchase or lease" (53%) and/or "discounts to install a home charger" (49%) are the incentives that would most encourage them to get an EV.

Low Carbon Fuels

- **One in four Americans say they have heard about the use of low carbon fuels in vehicles** before taking the survey.

    - Overall, two thirds of Americans (**67%) say they would likely use low carbon fuel in their personal vehicle** if the cost per gallon was the same as the cost for traditional fuel. Two in 10 Americans are unsure.

    - **Fourteen percent** of Americans say they would be **unlikely to use low carbon fuel** instead of traditional gasoline in their personal vehicle.

        - **Four in 10 Americans** who say they would be unlikely to use low carbon fuel in their personal vehicle say it's because of **"concern that low carbon fuels could negatively affect the performance of the vehicle" (42%)** and **"concern that low carbon fuel could damage the vehicle" (40%).**

- One in 10 Americans **(11%) say they have heard about the use of sustainable aviation fuel (SAF)** in airplanes before taking the survey.

- Overall, **a third of Americans** say they would be **'very likely' to choose a flight on a plane that uses low carbon fuel** if the cost of the ticket was the same as flying on a plane that uses traditional jet fuel.

Climate Change

- **Seven in 10** Americans say the issue of climate change is personally **'very important' (35%)** or **'somewhat important' (35%)** to them.

- Three out of four Americans **agree that human activities contribute to climate change**.

- **Six in 10 (62%)** Americans feel as though they have **at least some control over their personal impact on the environment.**

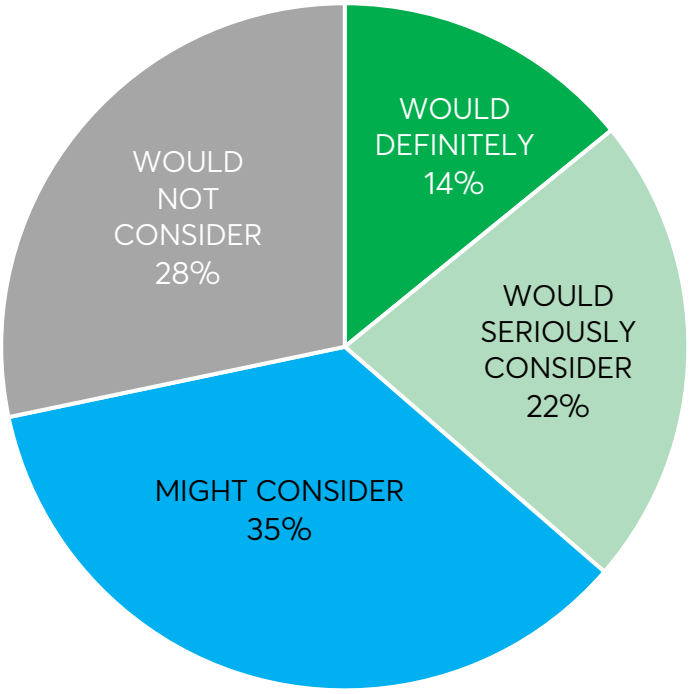
LIKELIHOOD OF BUYING OR LEASING AN ELECTRIC-ONLY VEHICLE

We asked Americans, ***"Which statement below BEST describes your thoughts on buying or leasing an electric-only vehicle if you were to buy or lease a vehicle today?"***

Fourteen percent of Americans say they **would definitely** buy or lease an electric-only vehicle if they were to buy or lease a vehicle today. Another two in 10 **(22%)** say they **would seriously** consider it, and **35 percent might** consider it in the future, but not if they were to get a vehicle today. More than a quarter **(28%)** say they **would not consider getting an electric-only vehicle.** There are several differences based on sociodemographics found below.[1]

LIKELIHOOD OF BUYING OR LEASING AN ELECTRIC-ONLY VEHICLE TODAY

All Americans



By Sociodemographics

- Males are more likely than females
- Younger adults are more likely than older adults
- Americans with higher education are more likely than those with lower education
- Americans with higher household income are more likely than those with lower household income
- Democrats are more likely than either Independents or Republicans
- Americans living in urban areas are more likely than those living in suburban or rural areas

Base: All respondents

Impact on the environment is a key social/emotional factor when choosing an EV. Nearly half (49%) of Americans who say they would definitely buy or lease an electric-only vehicle say reducing their impact on the environment is most important to them when choosing a vehicle, compared to 9% of Americans who would not consider buying or leasing an EV.

[1] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, political affiliation, number of commute days, weekly time spent driving, home ownership, type of home, access to an outlet at home, and EV experience.

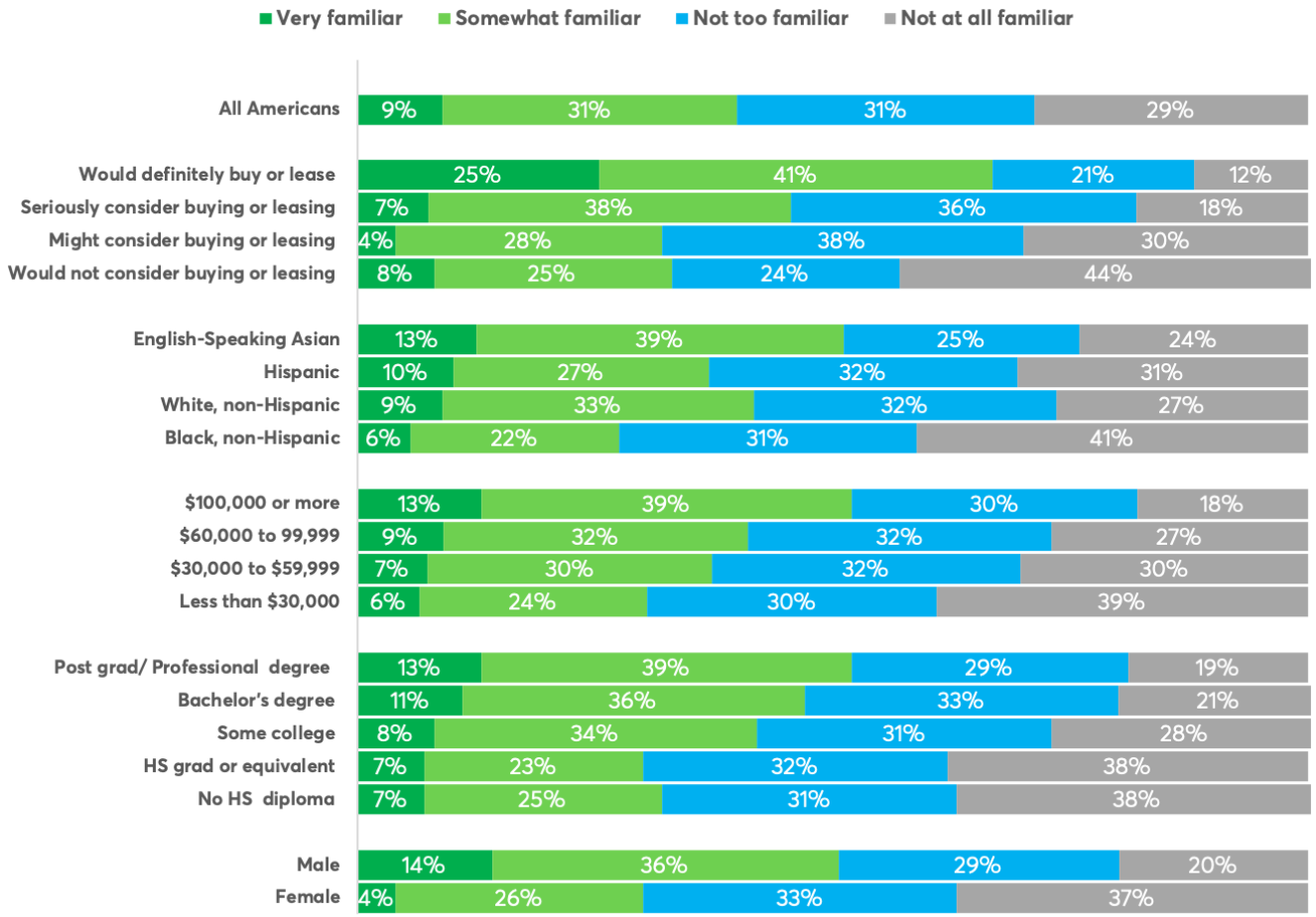
FAMILIARITY WITH ELECTRIC-ONLY VEHICLES

Only **9% of Americans say they are 'very' familiar with the fundamentals of owning an electric-only vehicle** which is not surprising since only 5% of Americans either currently own one (2%) or have in the past (3%). An additional three in 10 Americans (31%) say they are 'somewhat' familiar.

Familiarity is highly correlated with likelihood of buying/leasing an electric-only vehicle. More than two-thirds (67%) of Americans who say they **would definitely** buy or lease an electric-only if they were to buy a vehicle today say they are 'very' or 'somewhat' familiar with the fundamentals of owning an EV compared to 46% of Americans who **would seriously consider** buying an EV.

Black, non-Hispanic Americans are less familiar with EVs compared to white, non-Hispanic, Hispanic, and English-speaking Asian Americans. Also, those with higher household incomes, higher educations, and males are more likely to be familiar with the fundamentals of owning an electric-only vehicle.[2]

HOW FAMILIAR WOULD YOU SAY YOU ARE WITH THE FUNDAMENTALS OF OWNING AN EV?



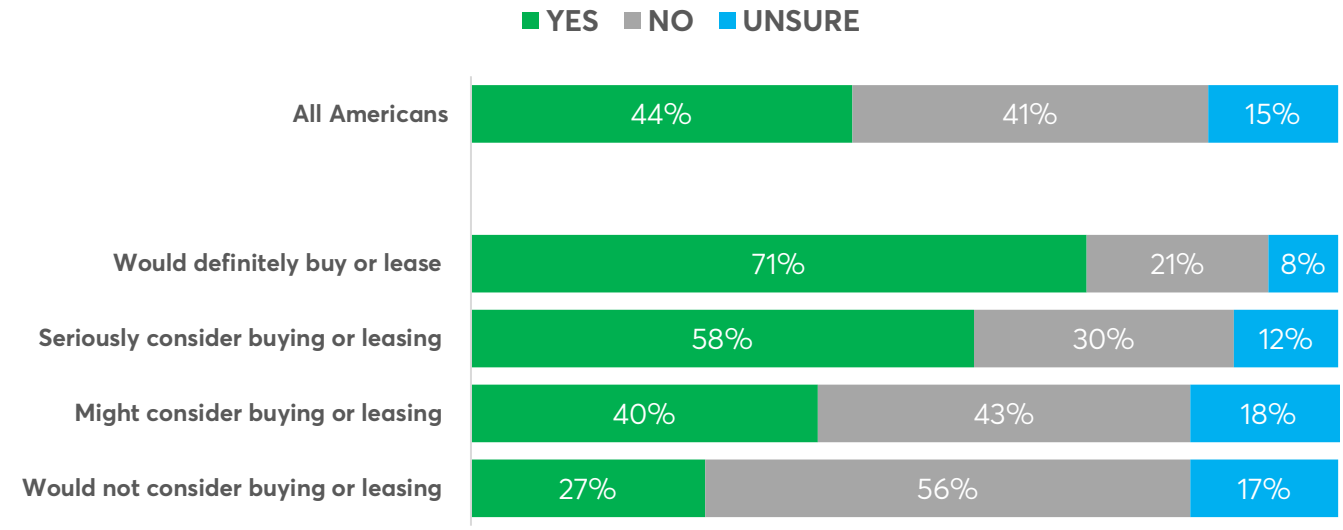
Base: All respondents

[2] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, and political affiliation.

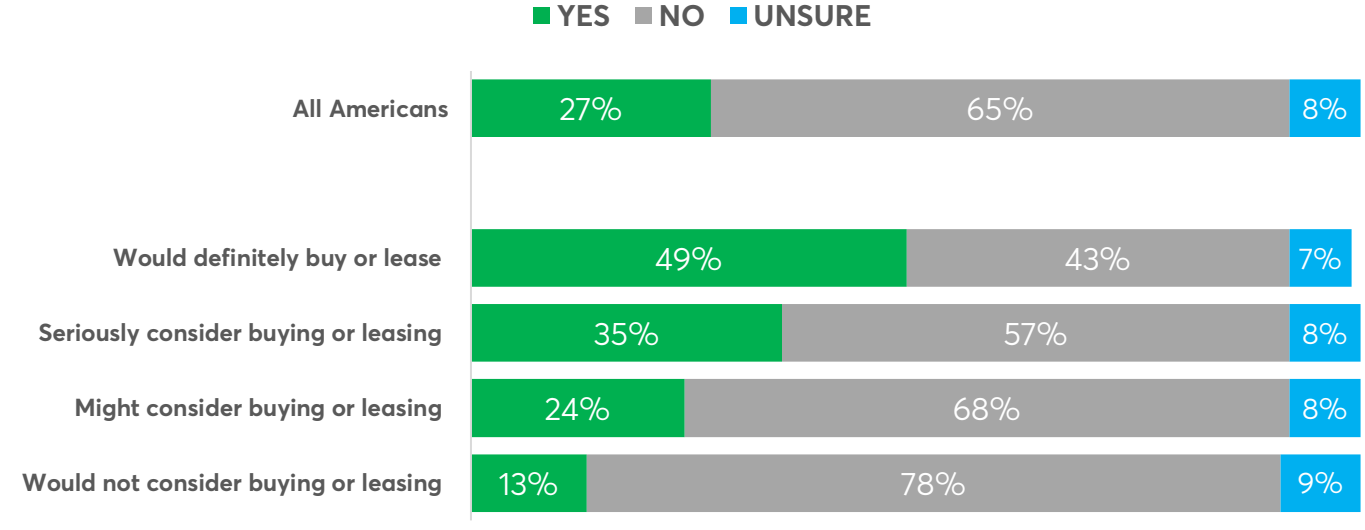
EV EXPOSURE

Americans who are more likely to say that they will buy/lease an electric-only vehicle if they were to get a vehicle today have had **more exposure to them**. They see them where they live and have friends, relatives, or co-workers who own one. Forty-four percent of all Americans have seen them in their neighborhood compared to 71% of those who say they would definitely buy or lease one if they were getting a vehicle today. About a quarter (27%) of Americans overall have a friend, relative, or co-worker who owns an EV compared to nearly half (49%) of Americans who say they would definitely buy or lease one.

IN THE PAST MONTH, HAVE YOU SEEN AN ELECTRIC-ONLY VEHICLE IN YOUR NEIGHBORHOOD?



DO YOU HAVE A FRIEND, RELATIVE, OR CO-WORKER WHO OWNS AN ELECTRIC-ONLY VEHICLE?

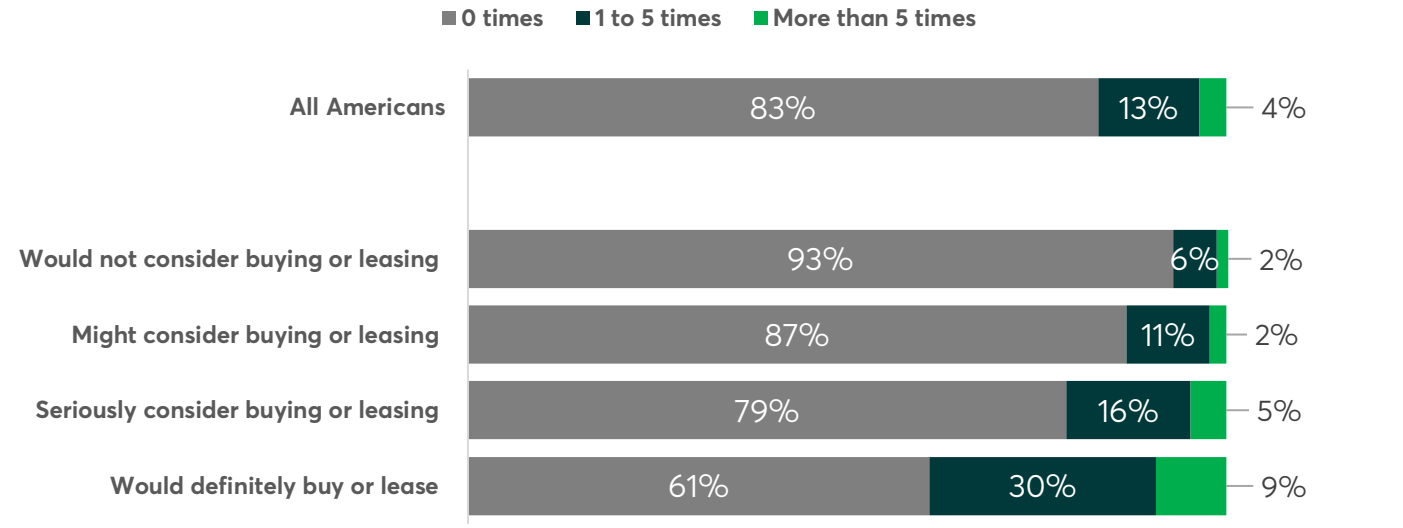


Base: All respondents

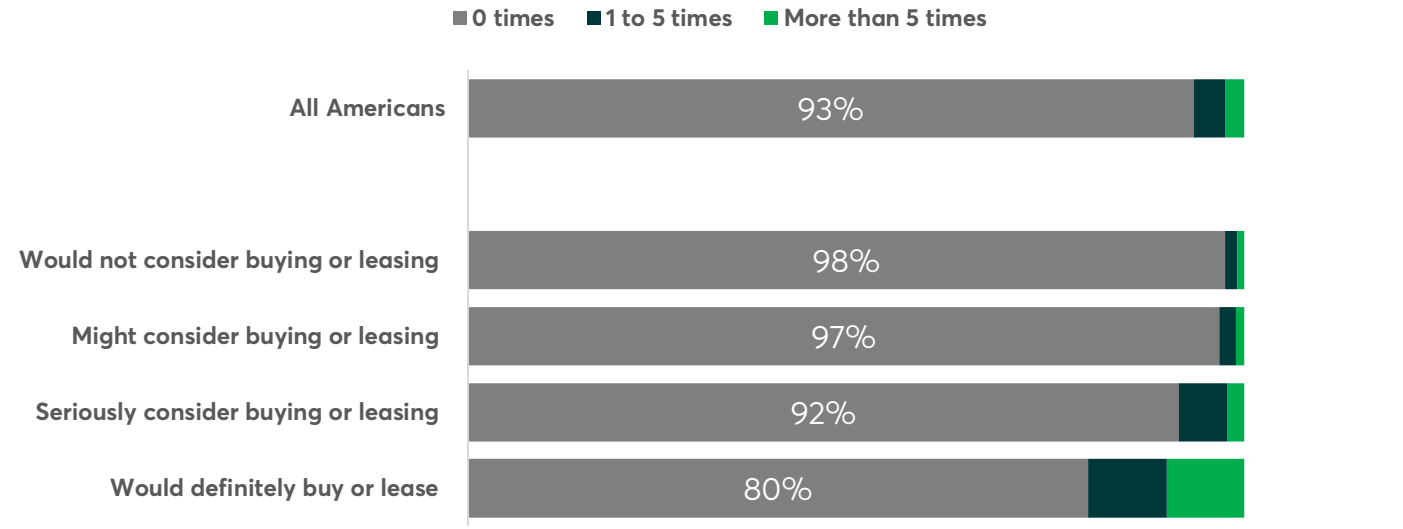
EV EXPERIENCE

There is also a **strong relationship between having some personal experience with an electric-only vehicle and the likelihood of buying or leasing one**. Just **seventeen percent** of all Americans have **been a passenger** in an electric-only vehicle in the past 12 months; this is compared to 39% of people who say they would definitely buy or lease an electric-only vehicle if they were to buy/lease a vehicle today. Similarly, only **seven percent of Americans have driven one** in the past 12 months, whereas 20% of those who would definitely buy/lease one have driven one.

IN THE PAST 12 MONTHS, HOW MANY TIMES HAVE YOU BEEN A PASSENGER IN AN ELECTRIC-ONLY VEHICLE?



IN THE PAST 12 MONTHS, HOW MANY TIMES HAVE YOU DRIVEN AN ELECTRIC-ONLY VEHICLE?



Base: All respondents

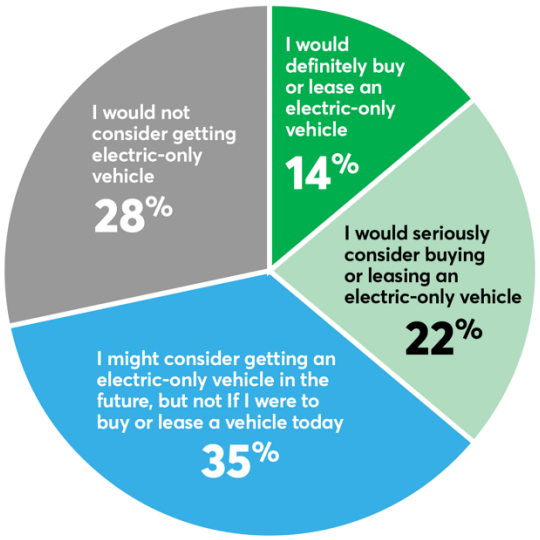
EV EXPERIENCE INDEX

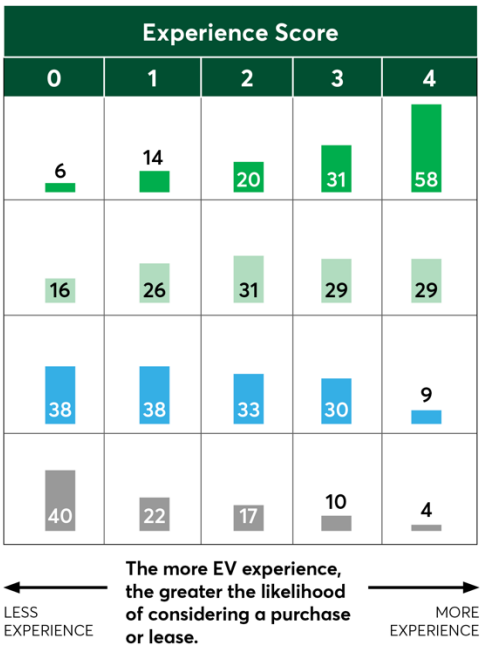
The "EV Experience Index" reflects the **sum total of the following four EV experience/exposure** questions:

1. In the past month, have you seen an electric-only vehicle in your neighborhood?
2. Do you have a friend, relative, or co-worker who owns an electric-only vehicle?
3. In the past 12 months, approximately how many times have you been a passenger in an electric-only vehicle? *(Responses were rescored '0' if respondent answered 0 times or '1' if the respondent had been a passenger at least once in the past year)*
4. In the past 12 months, approximately how many times have you driven an electric-only vehicle? *(Responses were rescored '0' if respondent answered 0 times or '1' if the respondent had driven an electric-only vehicle at least once in the past year)*

According to scores from the "EV Experience Index," more than half of Americans **(54%) report having some EV experience.** There are several differences based on sociodemographics found below.[3]

- English-speaking Asian Americans have more EV experience than any other group. Also, Hispanics have higher EV experience scores than White, non-Hispanic Americans.
- Males have higher experience scores than females.
- Democrats have higher experience scores than Independents or Republicans and Independents have higher experience scores that Republicans.
- Americans from the West have higher EV experience scores than those from any other region. In addition, Midwesterners have less EV experience than Southerners or Northeasterners.
- Americans who live in rural areas have lower EV experience scores than Americans living in urban or suburban areas. Those who live in urban settings have higher experience scores than those who live in suburban areas.
- EV experience scores go up with education and income, but down with age.

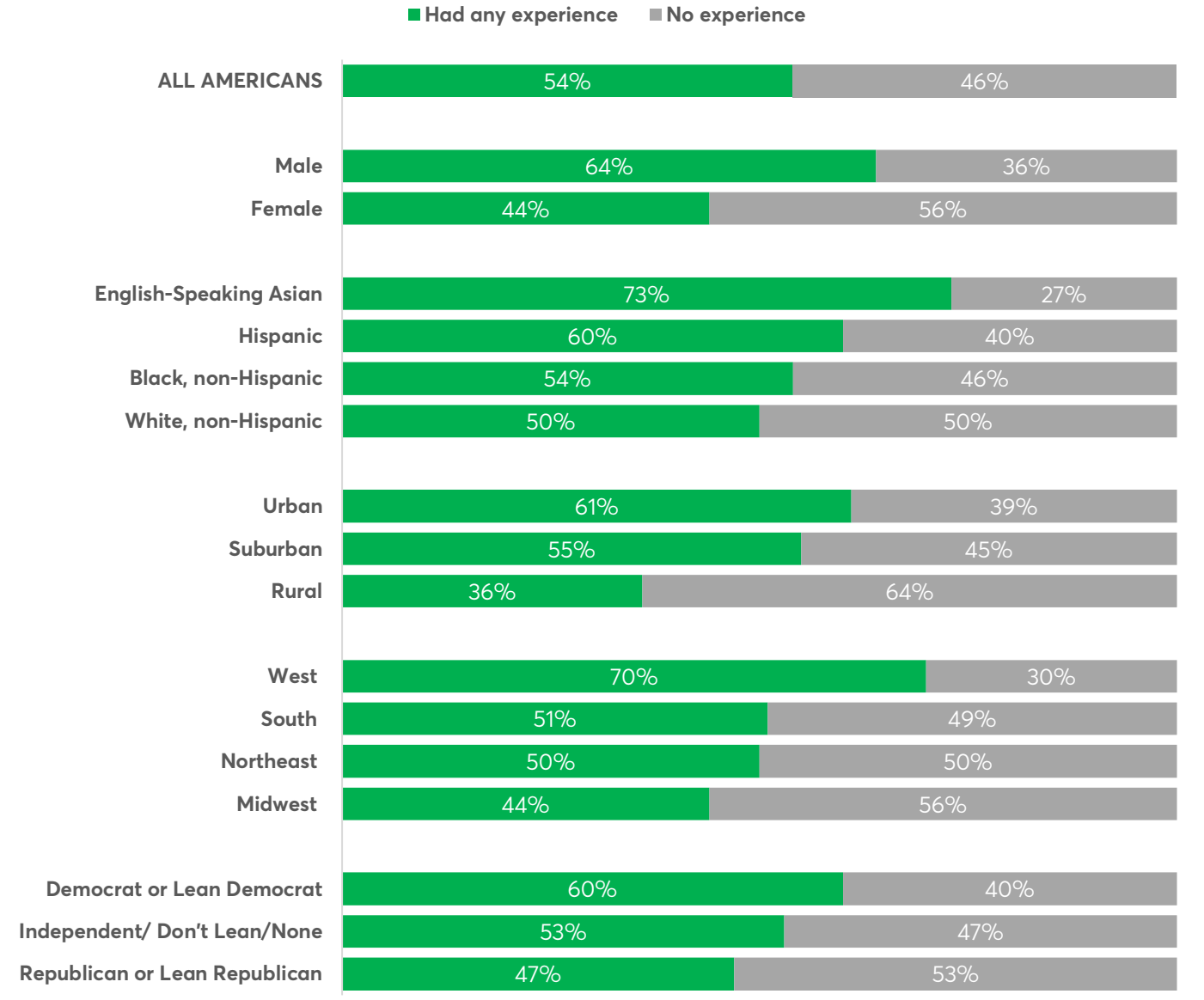




[3] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, and political affiliation.

The graphic below represents a clearer view of the data from the **EV Experience Index** as a dichotomy for some of the sociodemographic variables. Americans who reported '**any experience'** received a '1' for any of the four exposure/experience questions we asked about and those who '**did not report any experience'** received a '0' for all four of the exposure/experience questions we asked about.

HAD 'ANY' EV EXPERIENCE VS. 'NO' EV EXPERIENCE BY SOCIO-DEMOGRAPHIC VARIABLES



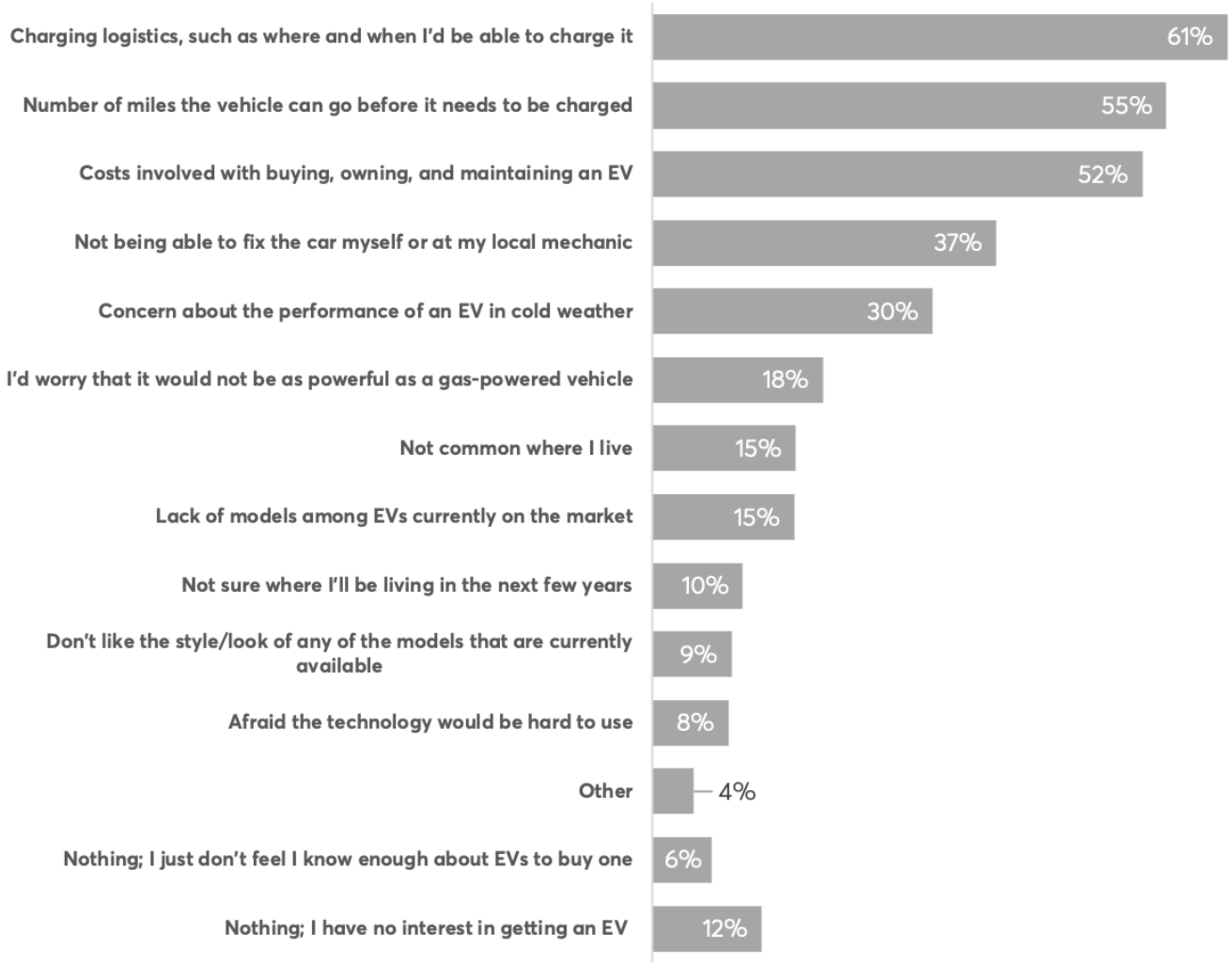
Base: All respondents

BARRIERS TO BUYING OR LEASING AN ELECTRIC-ONLY VEHICLE

We asked Americans who said they were not definitely planning to buy or purchase an EV if they were to buy/lease a car today, "***Of the following attributes, which, if any, would prevent you from buying or leasing an electric-only vehicle if you were to buy or lease a vehicle today?"***

The top three barriers reported are **charging logistics** (61%), the **number of miles the vehicle can go before it needs to be charged** (55%) and the **costs** involved with buying, owning, and maintaining an EV (52%).

BARRIERS TO BUYING OR LEASING AN EV

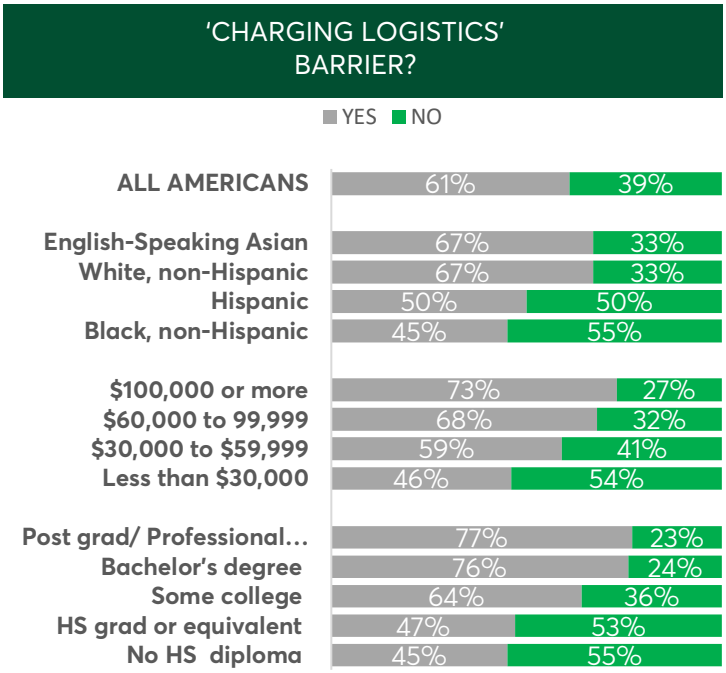


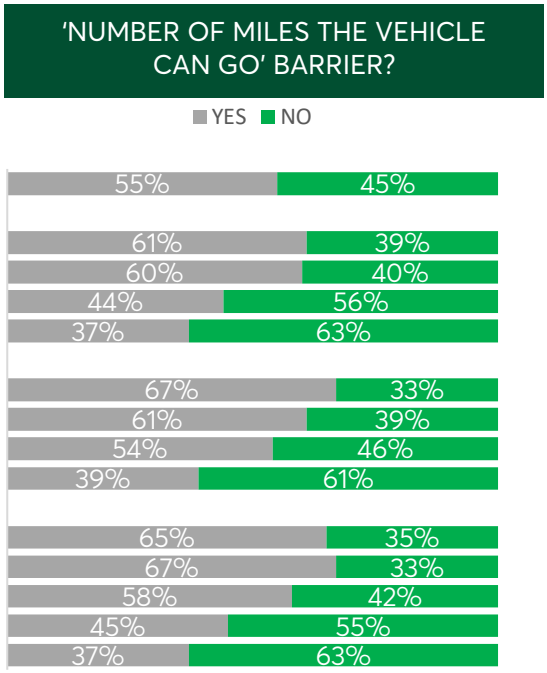
Base: Respondents who said something other than they "definitely plan" to buy or lease an electric-only vehicle if they were to buy or lease a vehicle today.

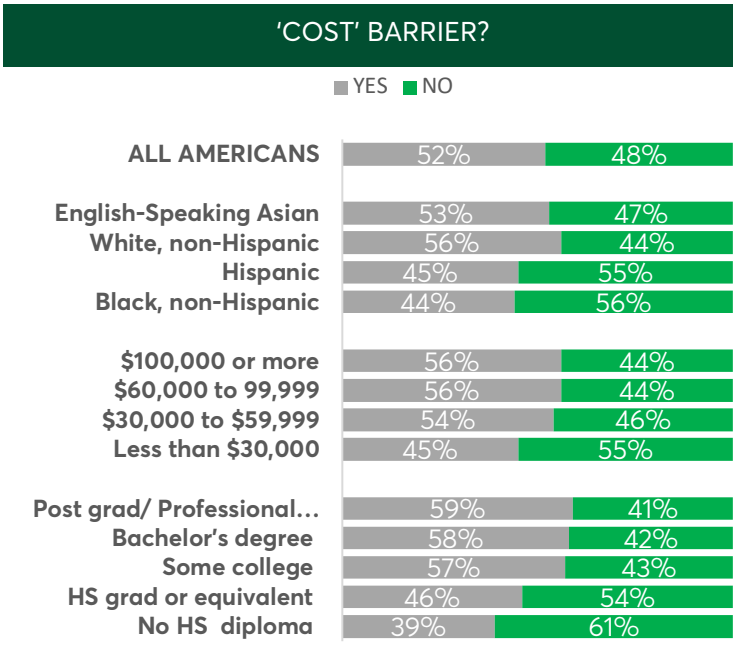
Respondents selected all that apply.

TOP THREE BARRIERS BY SOCIODEMOGRAPHICS

For all three barriers, a higher percentage of Americans with higher household income or higher education than those with lower household income or education selected each of these as a reason to prevent them from buying or leasing an electric-only vehicle if they were to buy a vehicle today. Race/ethnicity differences can be found below.[4]







Race/Ethnicity Differences

- White, non-Hispanic Americans are more likely than Black, non-Hispanic and Hispanic Americans to select charging logistics, miles the vehicle can go before needing a charge, and cost as barriers preventing them from buying an EV if they were to purchase/lease a vehicle today.
- English-speaking Asian Americans are more likely than Black, non-Hispanic and Hispanic Americans to say "the number of miles a vehicle can go before it needs to be charged" is a barrier.
- English-speaking Asian Americans are more likely than Black, non-Hispanic Americans to say "charging logistics" is a barrier.

Base: Respondents who said something other than they "definitely plan" to buy or lease an electric-only vehicle if they were to buy or lease a vehicle today. Respondents selected all that apply.

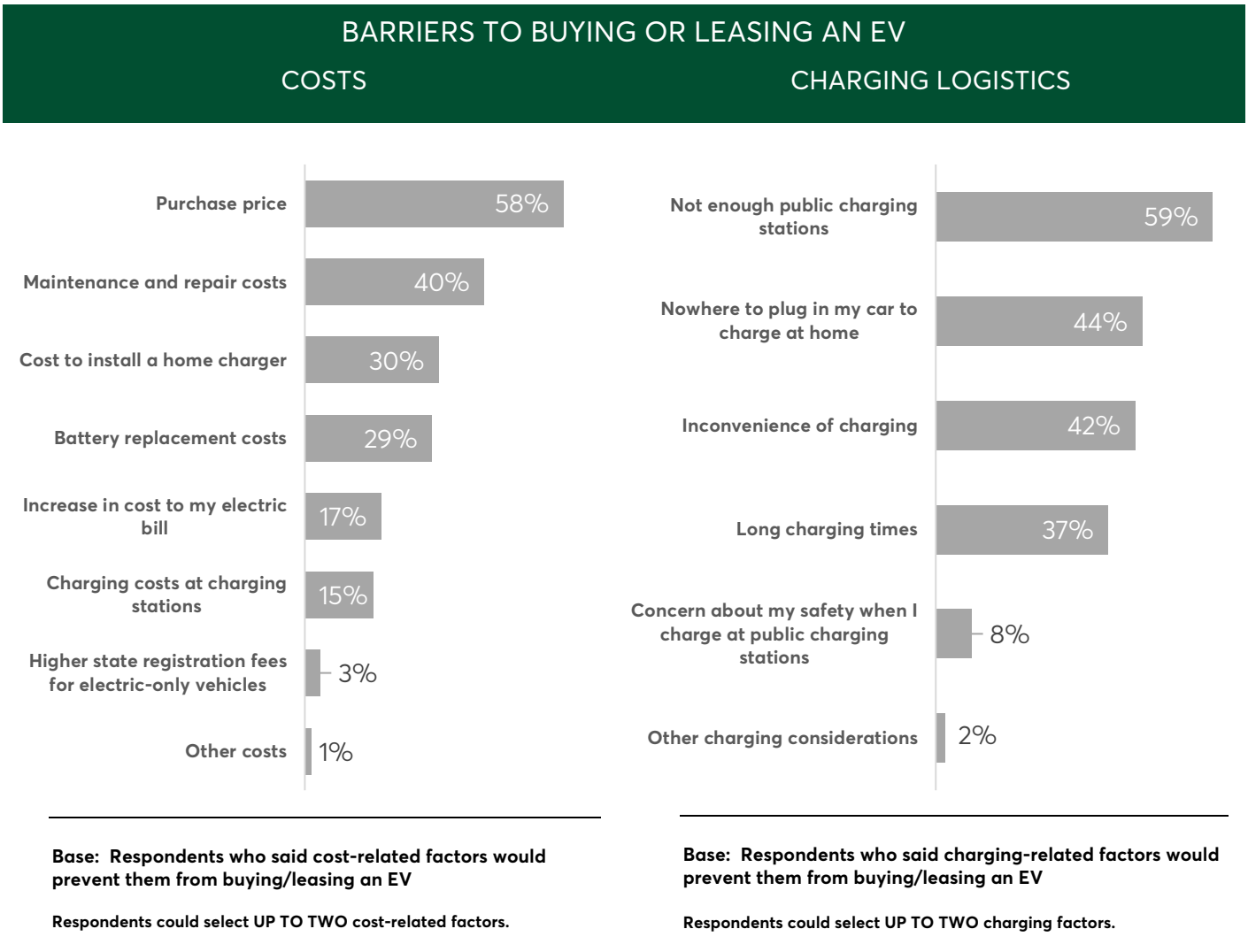
[4] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, political affiliation, number of commute days, weekly time spent driving, home ownership, type of home, likelihood of getting an EV, EV familiarity, EV experience, and access to an outlet at home.

A MORE DETAILED LOOK AT COST AND CHARGING LOGISTICS BARRIERS

For respondents who had indicated that **cost-related factors or charging logistics are barriers** preventing them from getting an EV, we asked an additional question for each specifically about which costs and/or charging-related barriers would be most likely to hold them back from purchasing/leasing an EV.

Purchase price (58%) and maintenance and repair costs (40%) are the top two cost-related factors holding people back while **not enough public charging stations was the top charging-related logistical factor (59%)** holding Americans back from purchasing/leasing an EV.

A larger percentage of **Black, non-Hispanic (54%) and Hispanic (48%)** Americans than white, non-Hispanic Americans (37%) say **maintenance and repair cost**s are holding them back. And a larger percentage of **English-speaking Asian Americans (15%), Hispanic (12%), and Black, non-Hispanic (11%)** than white, non-Hispanic Americans (6%) say **concern about their safety when charging at public charging stations** is a reason for holding them back.[5]



Base: Respondents who said cost-related factors would prevent them from buying/leasing an EV

Respondents could select UP TO TWO cost-related factors.

Base: Respondents who said charging-related factors would prevent them from buying/leasing an EV

Respondents could select UP TO TWO charging factors.

[5] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, EV experience, and political affiliation.

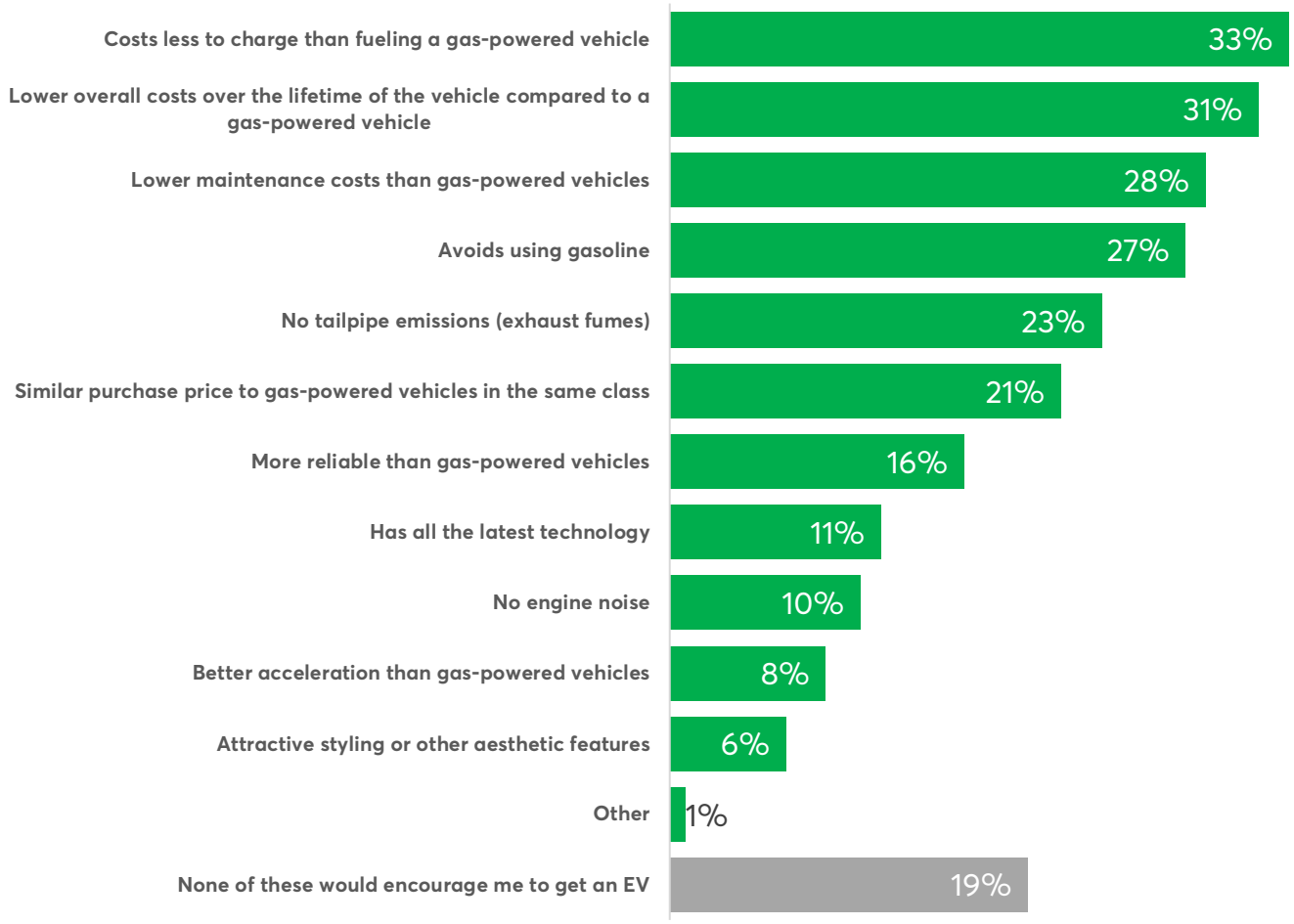
REASONS FOR BUYING/LEASING AN ELECTRIC-ONLY VEHICLE

EV ATTRIBUTES

We informed respondents ***"Below are attributes that an electric-only vehicle might have."*** And, then asked ***"Which, if any, of these would MOST encourage you to buy or lease an electric vehicle?"***

Cost-related factors are the most desirable attributes of an EV. **About three in 10 Americans** say that **"costs less to charge** than fueling a gas-powered vehicle" (33%) , "**lower overall costs over the lifetime of the vehicle** compared to a gas-powered vehicle" (31%), and "**lower maintenance costs** than a gas-powered vehicle" (28%) are the attributes that would most encourage them to get an EV.

WHICH, IF ANY, OF THESE WOULD MOST ENCOURAGE YOU TO BUY OR LEASE AN EV?



Base: All respondents

Respondents selected UP TO THREE responses.

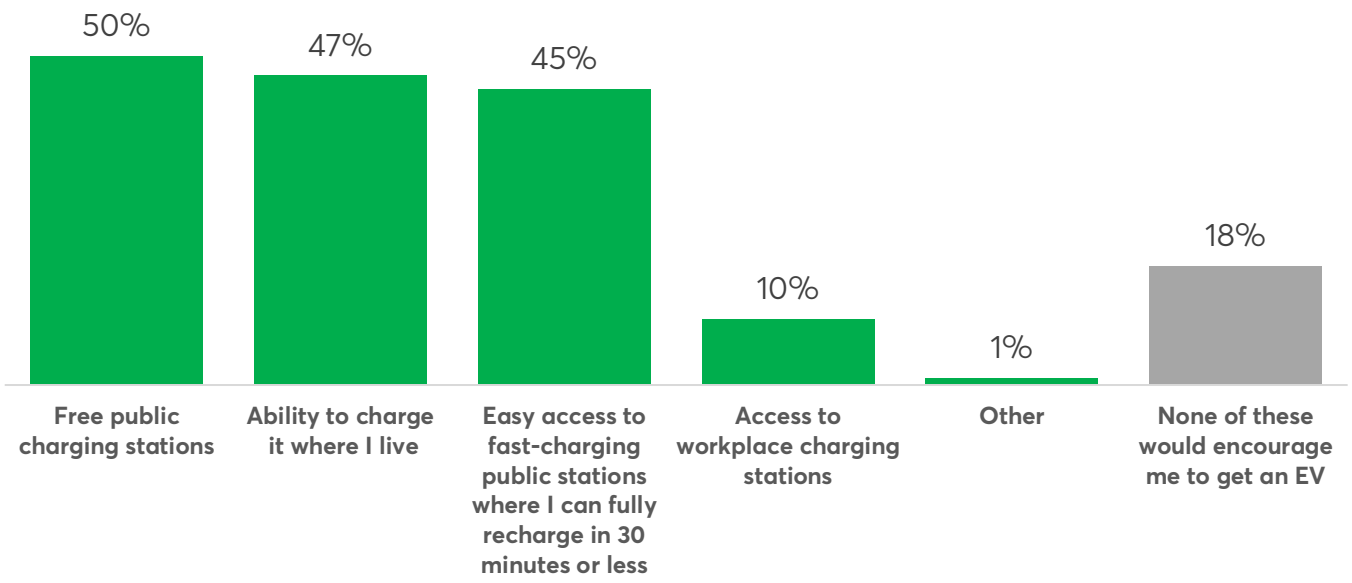
MOST DESIRABLE CHARGING OPTIONS

Half of Americans say **free public charging stations is the charging option that would most likely encourage** them to buy or lease an electric-only vehicle.

While 47% of Americans say the ability to charge it where they live would most encourage them to get an EV, a larger percentage of white, non-Hispanic Americans (49%) than Black, non-Hispanic (44%) or Hispanic Americans (42%) say this.[6]

Only **one in 10 Americans say access to workplace charging stations** would most encourage them to get an EV, but a larger percentage of Hispanic Americans (16%) than white, non-Hispanic Americans (9%) say this charging option would be most likely to encourage them to buy or lease an electric-only vehicle.[7]

WHICH, TWO, IF ANY, OF THE FOLLOWING CHARGING OPTIONS WOULD MOST ENCOURAGE YOU TO BUY OR LEASE AN ELECTRIC-ONLY VEHICLE?



Base: All respondents

Respondents selected UP TO TWO responses.

[6] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, political affiliation, number of days commuting, and access to an outlet at home.

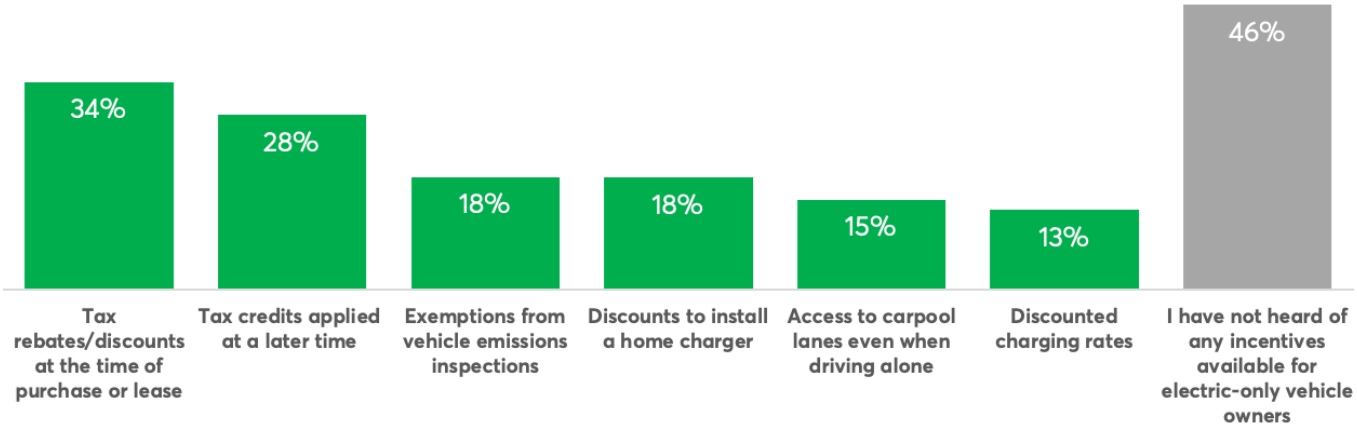
[7] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, political affiliation, number of days commuting, and access to an outlet at home.

KNOWLEDGE ABOUT INCENTIVES

We asked Americans about which incentives for electric-only vehicle owners they have heard about. Nearly half of Americans **(46%) have not heard about any incentives available for electric-only vehicle owners.**

A larger percentage of males (65%) than females (43%) say they have heard of incentives. Americans from households with higher incomes and with higher education are more likely to say they've heard of incentives for EV owners. Also, Westerners are more likely than people from other regions of the country and Democrats are more likely than Independents or Republicans to say they have heard of incentives available for electric-only vehicle owners.[8]

WHICH, IF ANY, OF THE FOLLOWING INCENTIVES FOR ELECTRIC-ONLY VEHICLE OWNERS HAVE YOU HEARD ABOUT?



Base: All respondents

Respondents selected all that apply.

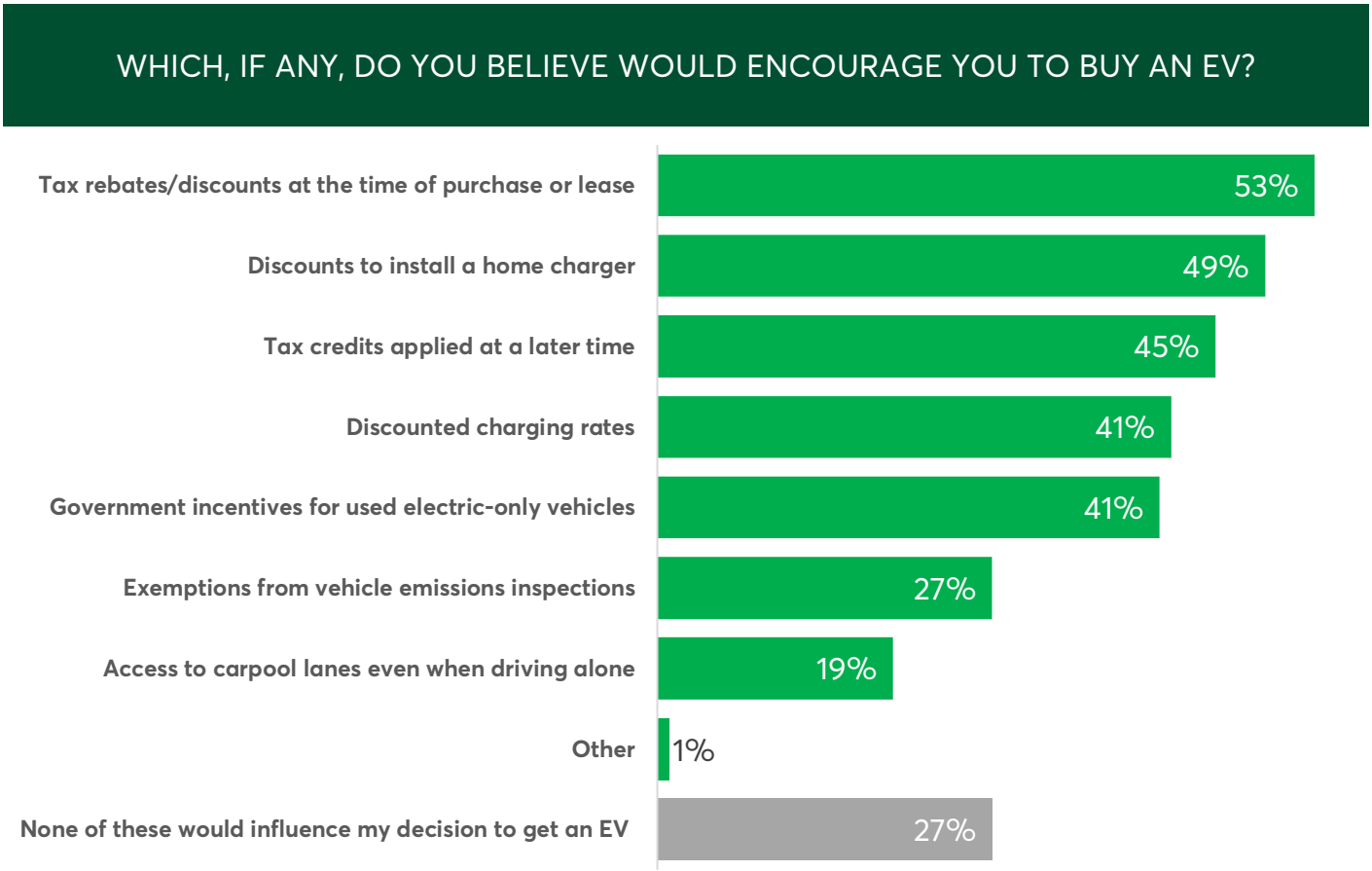
[8] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, EV experience, and political affiliation.

INCENTIVES

We then informed respondents ***"The following are incentives that are either already available for electric-only vehicle owners or are being considered by local or national government. Which, if any, do you believe would encourage you to buy or an electric-only vehicle?***

About half say "tax rebates/discounts at the time of purchase or lease" (53%) and/or "discounts to install a home charger" (49%).

Americans from **households with higher incomes are more likely** than those with lower household incomes to say **each of these incentives** (with the exception of 'exemptions from vehicle emissions inspections') **would encourage them to buy an EV.**[9]



Base: All respondents
Respondents selected all that apply.

[9] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, and political affiliation.

EV OWNERS VS. NON-OWNERS

EV INCIDENCE

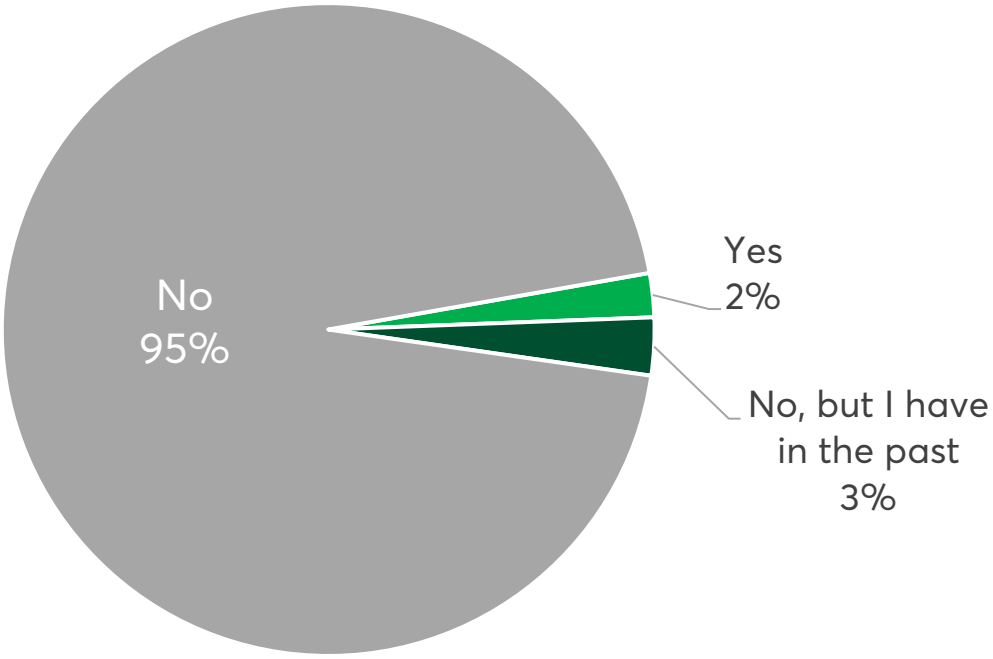
Only **two percent** of Americans **currently have a battery electric vehicle (BEV).** A BEV was defined as:

> ***"A vehicle like Tesla and the Nissan Leaf that are electric ONLY and do not take gasoline or any fuel other than electricity."***

While the sample of EV owners is too small to detect any potential demographic differences between EV owners and non-EV owners, there are some notable similarities and differences in the experiences, attitudes, and behaviors of EV owners vs. non-EV.

For one, an unexpected similarity is that EV owners' driving behaviors in terms of commuting frequency and distance, and the number of total hours spent driving weekly is similar to non-EV owners. Also, there are no differences between in the number of household vehicles between EV owners and non-EV owners. EV owners also live in similar types housing to non-EV owners.[10]

EV OWNERSHIP



Base: All respondents

[10] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, and political affiliation.

EV OWNERS' INNER CIRCLE

Current EV owners (71%) are more likely than past EV owners (45%) or those who have never owned an EV (44%) to say they have **seen an electric-only vehicle in their neighborhood** in the past month. However, it is quite possible that it's more a matter of being familiar with EVs than actually seeing or not seeing them where you live.[11]

In the past month, have you seen an electric-only vehicle in your neighborhood?

71%
OF **CURRENT EV OWNERS** SAY 'YES'
9% are unsure

45%
OF **PAST EV OWNERS** SAY 'YES'
11% are unsure

44%
OF **NON-EV OWNERS** SAY 'YES'
15% are unsure

Do you have a friend, relative, or co-worker who owns an electric-only vehicle?

A higher percentage of **current EV owners (61%)** than past EV owners (40%) or Americans who have never owned an EV (26%) have **a friend, relative, or co-worker who owns an electric only vehicle.** Also, past EV owners are more likely than those who have never owned one to have a friend, relative, or co-worker own an electric-only vehicle.[12]

61%
OF **CURRENT EV OWNERS** SAY 'YES'
11% are unsure

40%
OF **PAST EV OWNERS** SAY 'YES'
9% are unsure

26%
OF **NON-EV OWNERS** SAY 'YES'
8% are unsure

[11] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, and political affiliation.
[12] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, and political affiliation.

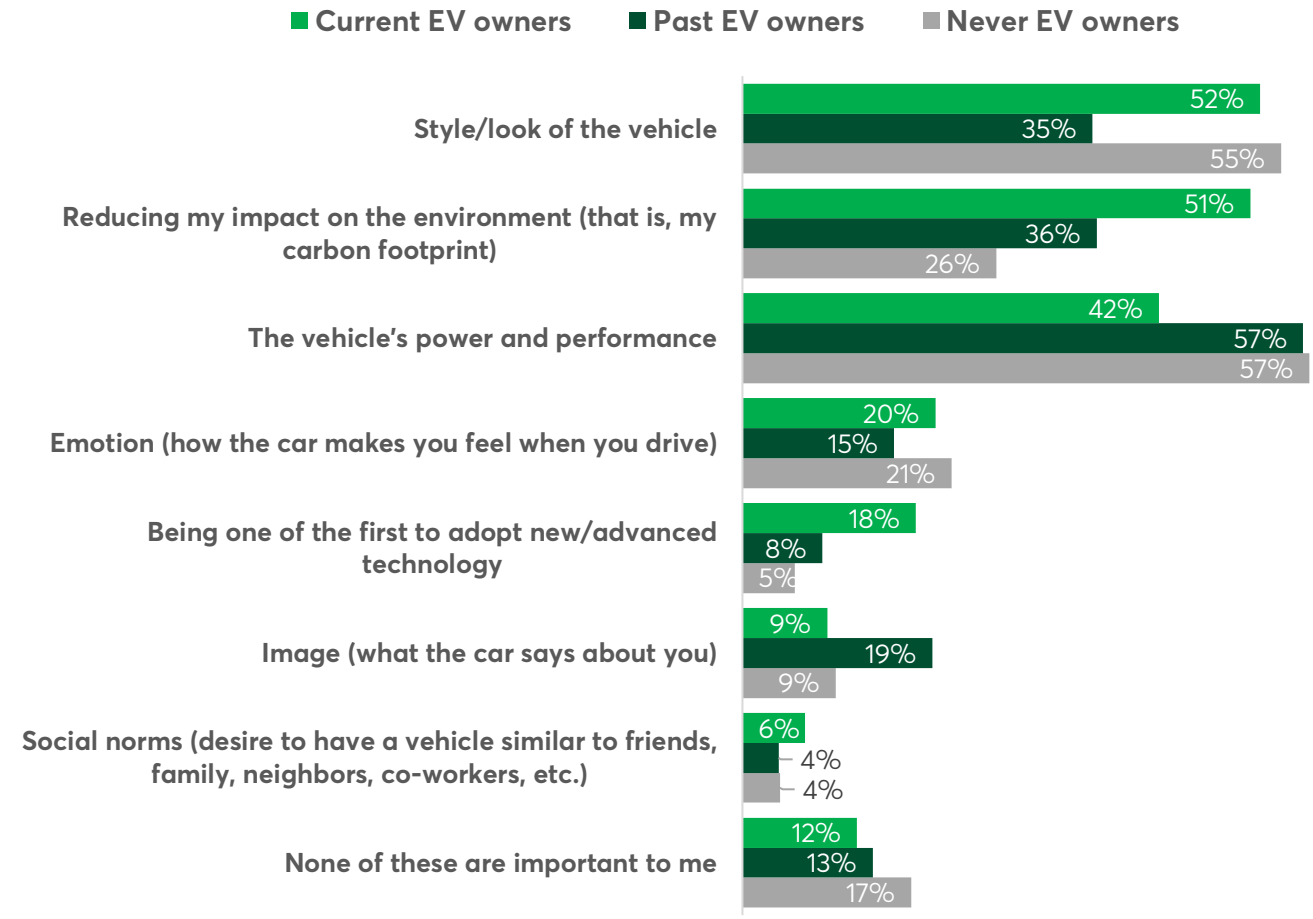
MOST IMPORTANT SOCIAL/EMOTIONAL FACTORS THAT IMPACT VEHICLE PURCHASE DECISIONS

We provided the following statement:

> *"While we understand there are many factors to consider when buying or leasing a vehicle, for this question we are interested in understanding what social/emotional factors impact your vehicle purchasing decisions. After reading the list below, please tell us which, if any, would be most important to you if you were to buy or lease a vehicle today."*

A larger percentage of **current EV owners (51%)** than past EV owners (36%) or those who have never owned an EV (26%) say **reducing their impact on the environment is one of the most important factors** to them if they were to buy or lease a vehicle today. **Current EV owners (18%)** are also more likely to report **"being one of the first to adopt new/advanced technology"** compared to past EV owners (8%) or those who have never owned one (5%). A larger percentage of **non-EV owners (57%)** than EV owners (42%) say the **vehicle's power and performance** is one of the most important social/emotional factors when purchasing a vehicle. [13]

MOST IMPORTANT SOCIAL/EMOTIONAL FACTORS WHEN PURCHASING A VEHICLE



Base: All respondents
Respondents selected UP TO THREE responses.

[13] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, and political affiliation.

LIKELIHOOD OF MAKING ENVIRONMENTALLY-FRIENDLY TRANSPORTATION CHOICES

CHOOSING A VEHICLE

Overall, **fourteen percent** of Americans say if they were to buy or lease a vehicle today, they **would definitely buy or lease an electric-only vehicle.** In contrast, **six in 10 current EV owners** say they **would definitely buy or lease an electric-only vehicle if they were to buy a vehicle today**. Only 24% of past EV owners and 13% of those who never owned one say they "would definitely buy or lease an electric-only vehicle" if they were buying a vehicle today.[14]

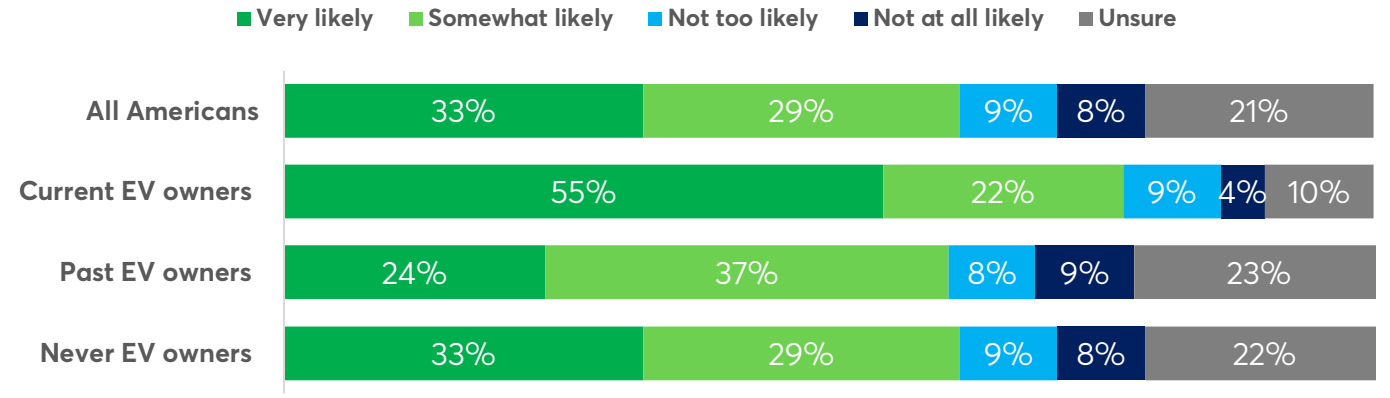
WHICH STATEMENT BEST DESCRIBES YOUR THOUGHTS ON BUYING OR LEASING AN ELECTRIC-ONLY VEHICLE IF YOU WERE TO BUY OR LEASE A VEHICLE TODAY?

	Total %	Current EV owners %	Past EV owners %	Never EV owners %
Definitely would buy or lease an electric-only vehicle	14	60	24	13
Seriously consider buying or leasing an electric-only vehicle	22	19	28	22
Might consider getting an electric-only vehicle in the future, but not If I were to buy or lease a vehicle today	35	14	30	36
Would not consider getting an electric-only vehicle	28	8	18	29
Base: All respondents	8,014			

CHOOSING A FLIGHT ON A PLANE THAT USES LOW CARBON FUEL

More than half of current EV owners (55%) say that if they had a choice, they would be 'very likely' to choose a flight on a plane that uses low carbon fuel if the cost of the ticket was the same as flying on a plane that uses traditional jet fuel compared to 24% of past EV owners and a third of those who have never owned one.[15]

LIKELIHOOD OF CHOOSING A FLIGHT ON A PLANE THAT USES LOW CARBON FUEL IF THE COST OF THE TICKET WAS THE SAME AS FLYING ON A PLANE THAT USES TRADITIONAL JET FUEL



Base: All respondents

[14] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, and political affiliation.

[15] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, and political affiliation.

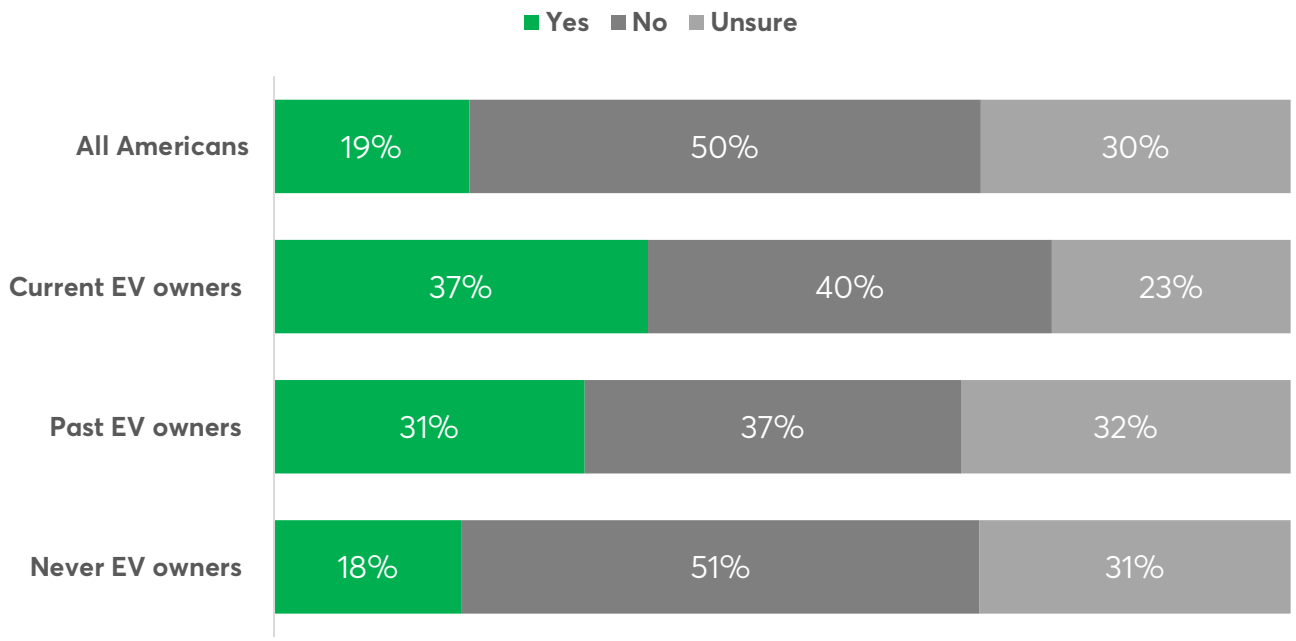
PAYING MORE FOR SHIPPING THAT USES AN ELECTRIC-ONLY DELIVERY TRUCK

We asked respondents ***"While many online retailers provide free shipping to their customers, would you be willing to forego free shipping, or pay more when shopping at retailers where free shipping is not an option, if a company uses an electric-only delivery truck?"***

Overall, **nineteen percent of Americans** who use online retailers say they would be willing to **forego free shipping, or pay more** when shopping at retailers where free shipping is not an option, **if a company uses an electric-only delivery truck.**

A larger percentage of both current EV owners (37%) and past EV owners (31%) than Americans who have never owned an EV (18%) say they are willing to pay more if a company uses an electric-only delivery truck.[16]

WILLINGNESS TO PAY MORE FOR SHIPPING USING AN ELECTRIC-ONLY DELIVERY TRUCK



Base: All respondents with the exception of those saying 'not applicable' which were removed from the base

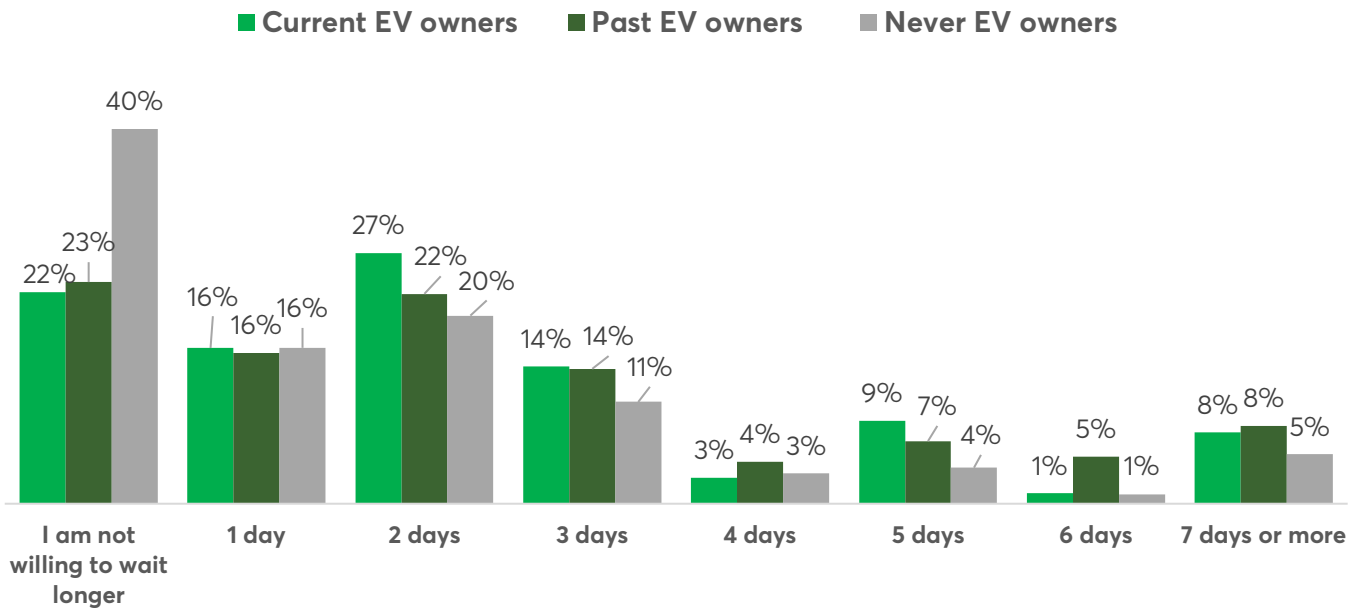
[16] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, and political affiliation.

WILLING TO WAIT LONGER FOR SHIPPING THAT USES AN ELECTRIC-ONLY DELIVERY TRUCK

About **four in 10 (39%) Americans** who use online retailers say they are **not willing to wait longer** to receive a package to ensure that it is shipped by an electric-only delivery truck. For those who are, they are willing to wait an average of three days.

Current and past EV owners are also more likely than non-EV owners to say they would be willing to wait to receive a package to ensure that it is shipped by an electric-only delivery truck. About eight in 10 current EV owners (78%) and past EV owners (77%) say they are **willing** to wait longer compared to six in 10 non-EV owners.[17]

IN GENERAL, HOW MUCH LONGER WOULD YOU BE WILLING TO WAIT TO RECEIVE A PACKAGE TO ENSURE IT'S SHIPPED BY AN ELECTRIC-ONLY DELIVERY TRUCK?



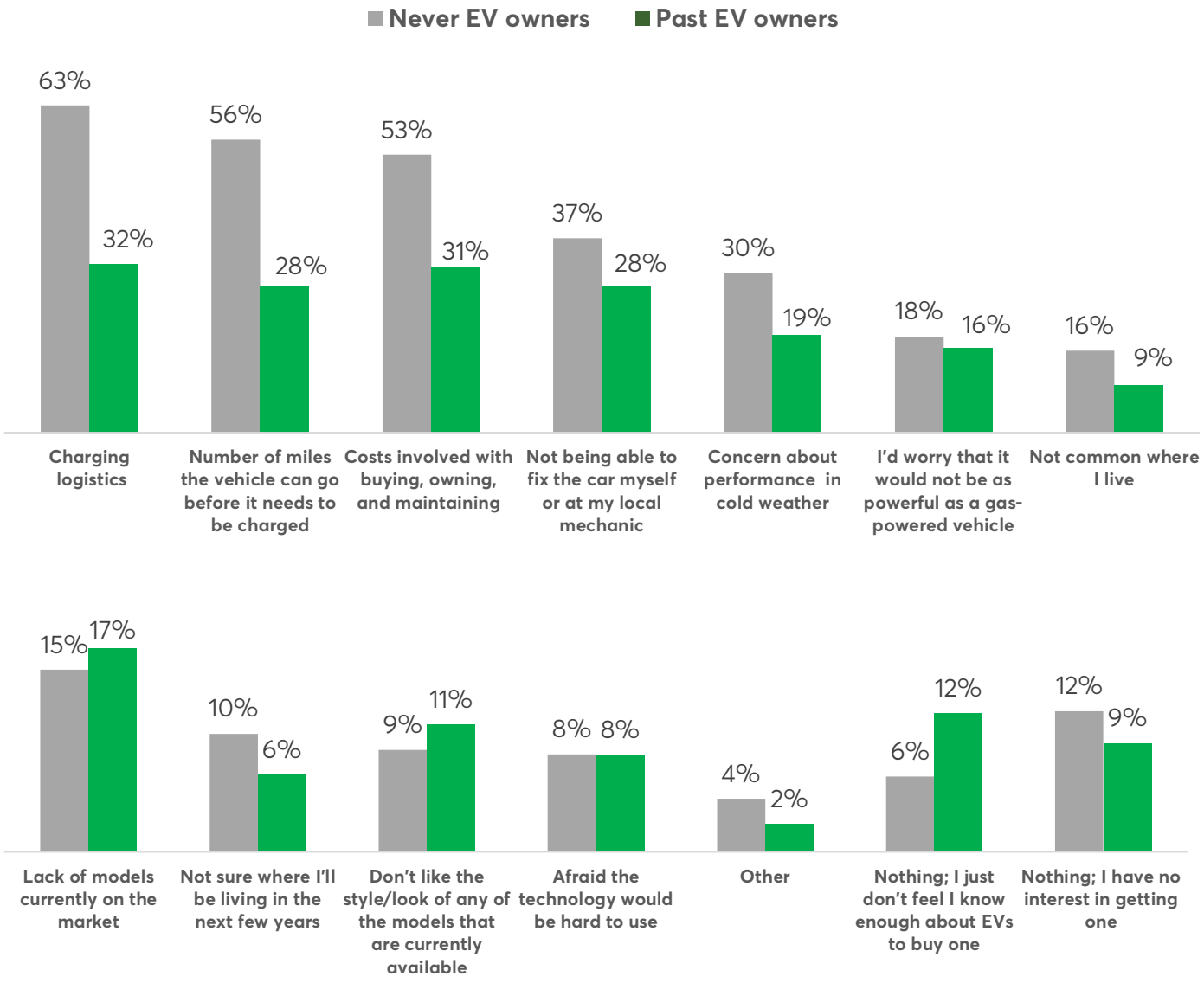
Base: All respondents with the exception of those saying 'not applicable' which were removed from the base

[17] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, and political affiliation.

BARRIERS TO BUYING/LEASING AN EV

There is a **clear pattern to the perceptions of barriers between past EV owners and Americans who have never owned an EV**. Six in 10 **(63%) Americans who have never owned an EV say that charging logistics** would prevent them from buying or leasing an EV **compared to 32% of past owners** who say this. Similarly, more than half of those who have never owned an EV say the number of miles the vehicle can go before it needs a charge (56%) and costs involved with buying, owning, and maintaining it (53%) compared to 28% and 31% respectively for past EV owners.

BARRIERS TO BUYING OR LEASING AN EV



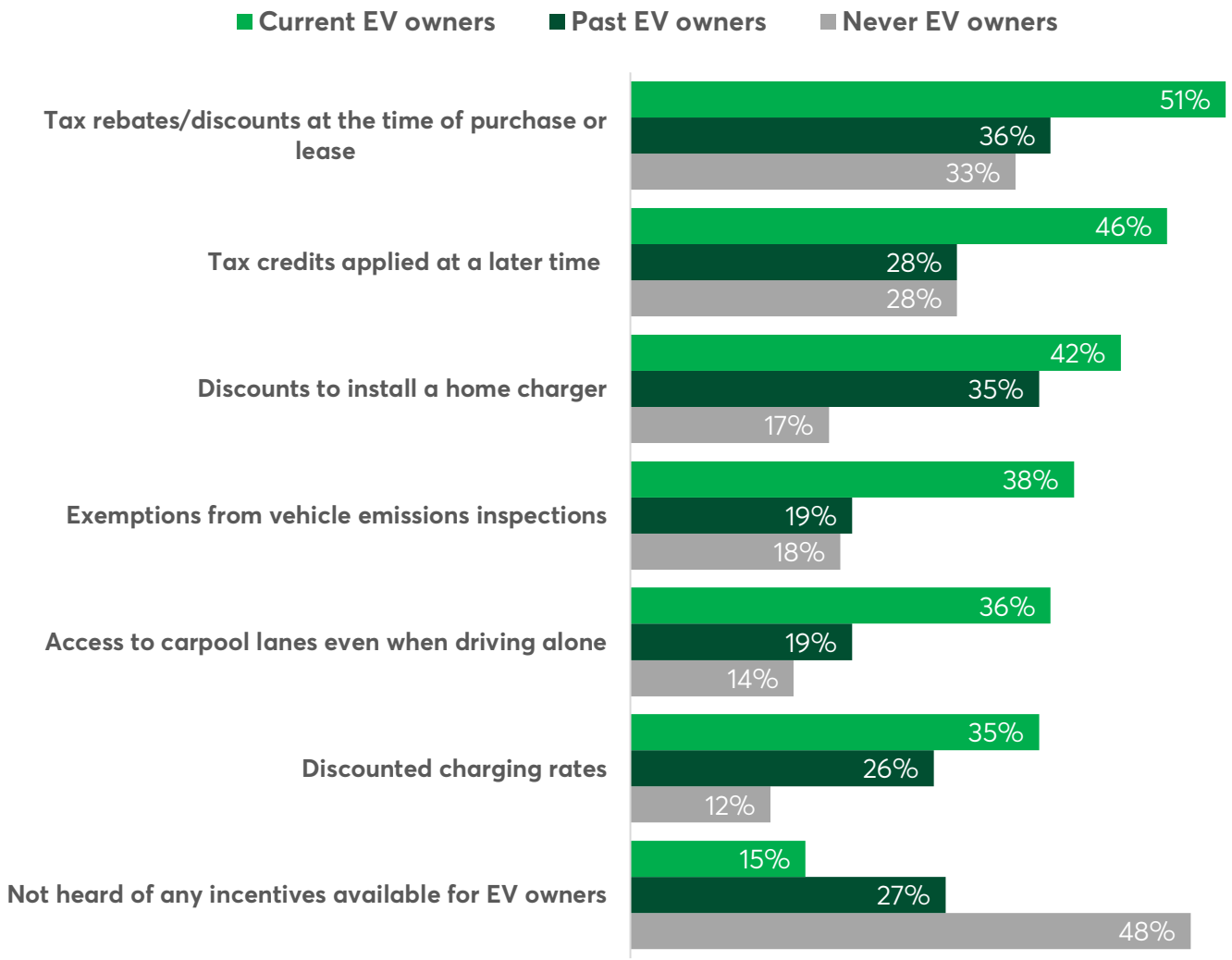
Base: Respondents who said something other than they "definitely plan" to buy or lease an electric-only vehicle if they were to buy or lease a vehicle today.

Respondents selected all that apply.

AWARENESS ABOUT INCENTIVES

While it is not surprising that a greater percentage of current EV owners report having heard about each of the incentives we asked about compared to past EV owners or Americans who have never owned an EV, it is surprisingly that **15% of current EV owners have not heard of any of the incentives we asked about.** In addition, for most of the incentives we asked about, a large majority of current EV owners have not heard about them.

WHICH, IF ANY, OF THE FOLLOWING INCENTIVES FOR ELECTRIC-ONLY VEHICLE OWNERS HAVE YOU HEARD ABOUT?

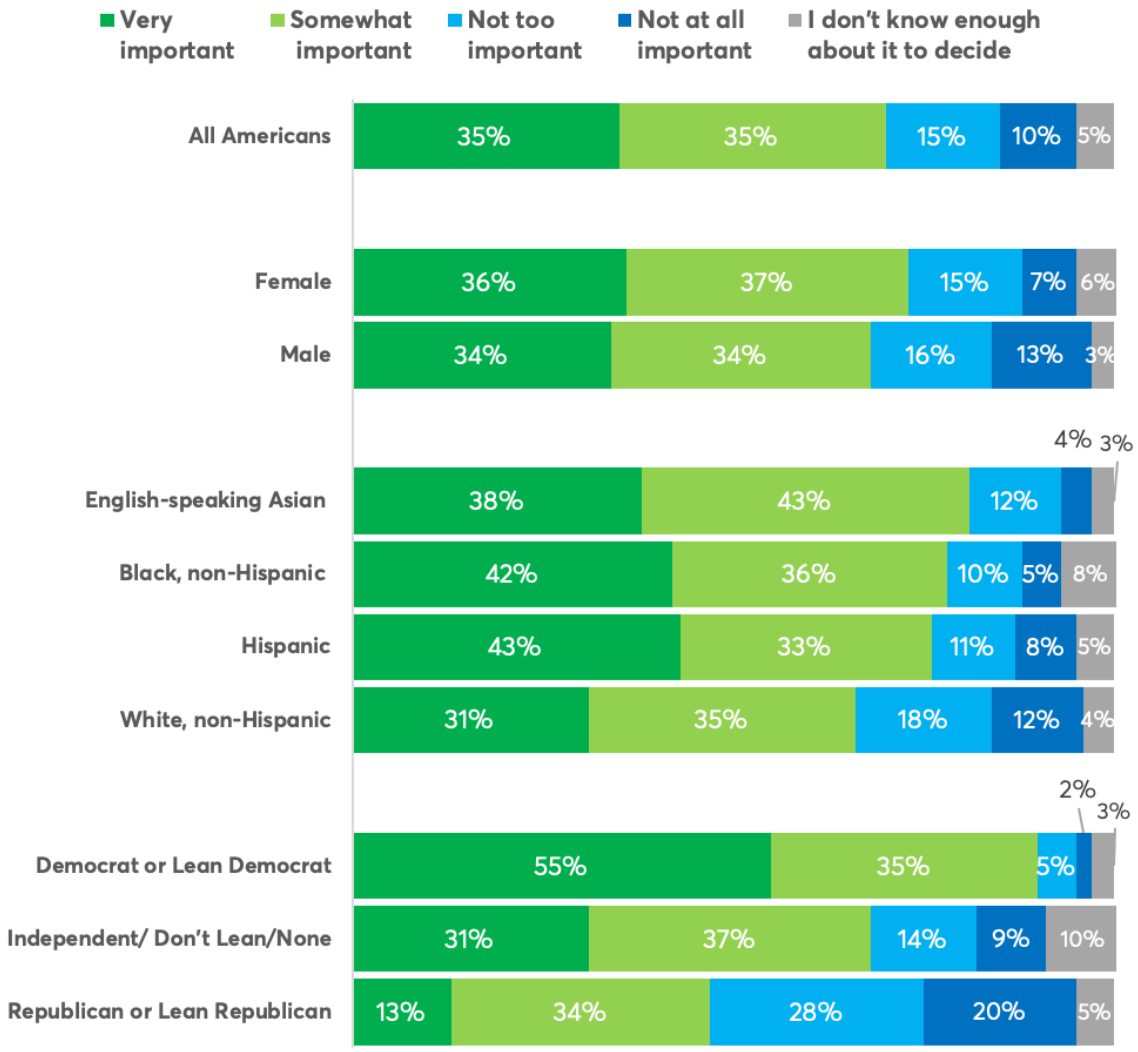


Base: All respondents

THE IMPORTANCE OF CLIMATE CHANGE

Seven in 10 Americans say the issue of climate change is personally 'very important' (35%) or 'somewhat important' (35%) to them. Females are more likely than males and Democrats are more likely than Independents or Republicans to say climate change is personally important to them. A larger percentage of Black, non-Hispanic (78%) and Hispanic (76%) than white, non-Hispanic (67%) Americans say climate change is 'very' or 'somewhat' important to them.[18]

HOW IMPORTANT OR NOT IMPORTANT TO YOU PERSONALLY IS THE ISSUE OF CLIMATE CHANGE?



Base: All respondents

[18] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, and political affiliation.

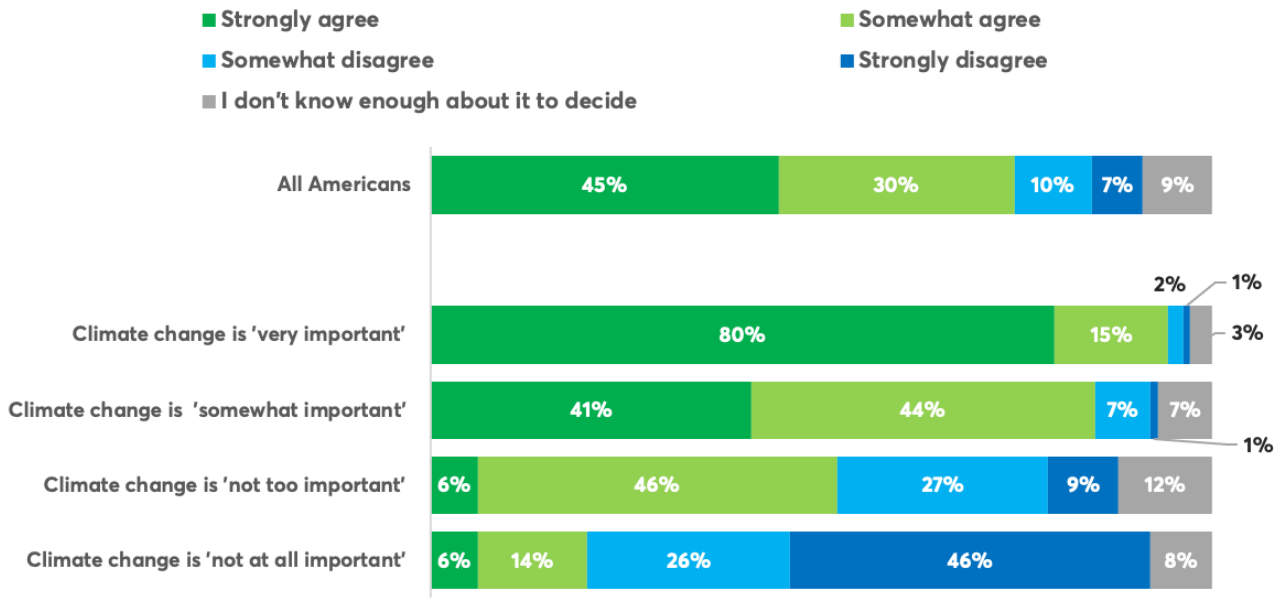
OPINIONS ABOUT CLIMATE CHANGE

We asked Americans ***"How much do you agree or disagree with the following statement:***
"Human activities contribute to climate change"

Overall, **three quarters of Americans agree that human activities contribute to climate change**. Age and education are related to opinions about this statement. A larger percentage of **younger adults and those with higher education than older adults and people with less education agree that human activities contribute to climate change.** A larger percentage of English-speaking Asian Americans (86%) and Black, non-Hispanic (76%) Americans than white, non-Hispanic Americans (74%) agree with that statement. Lastly, a larger percentage of Democrats (90%) than Independents (69%) or Republicans (59%) agree that human activities contribute to climate change.[19]

The importance of climate change as a personal issue for an individual is directly related to taking ownership for it. **Eight in 10 Americans who say climate change is 'very important' to them personally 'strongly agree' that human activities contributed to it.** In contrast, only six percent of Americans who say climate change is 'not at all important' to them 'strongly agree' that humans contributed to climate change.

PERCENTAGE OF WHO AGREE/DISAGREE THAT
"HUMAN ACTIVITIES CONTRIBUTE TO CLIMATE CHANGE "



Base: All respondents

[19] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, and political affiliation.

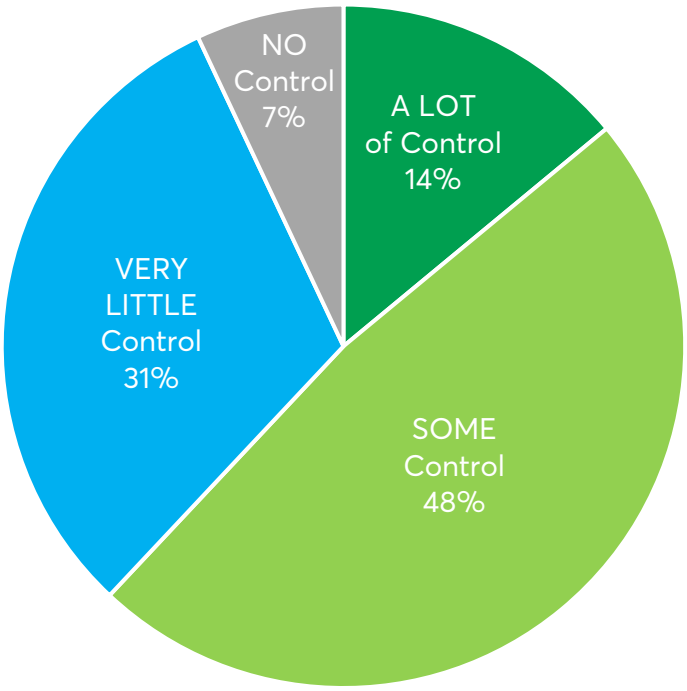
AMERICANS' DEGREE OF CONTROL OVER THEIR PERSONAL IMPACT ON THE ENVIRONMENT

We asked Americans ***"In your day-to-day life (shopping, transportation, household behaviors, food choices, etc.), how much control do you believe you have over your personal impact on the environment?"***

Six in 10 (62%) Americans feel as though they have **at least some control over their personal impact on the environment.** Americans who say the **issue of climate change is important** to them **are more likely than those who don't view climate change as important** to them **personally to say they have control over their personal impact on the environment** in their day-to-day life.

Some sociodemographic differences are shown in the graph below.[20]

HOW MUCH CONTROL DO YOU BELIEVE YOU HAVE OVER YOUR PERSONAL IMPACT ON THE ENVIRONMENT?



HAVING MORE CONTROL...

- Females are more likely than males
- Older adults are more likely than younger adults
- Americans with higher education are more likely than those with lower education
- Democrats are more likely than either Independents or Republicans
- Americans who say they are more likely to get an electric-only vehicle if they were to buy or lease a vehicle today

Base: All respondents

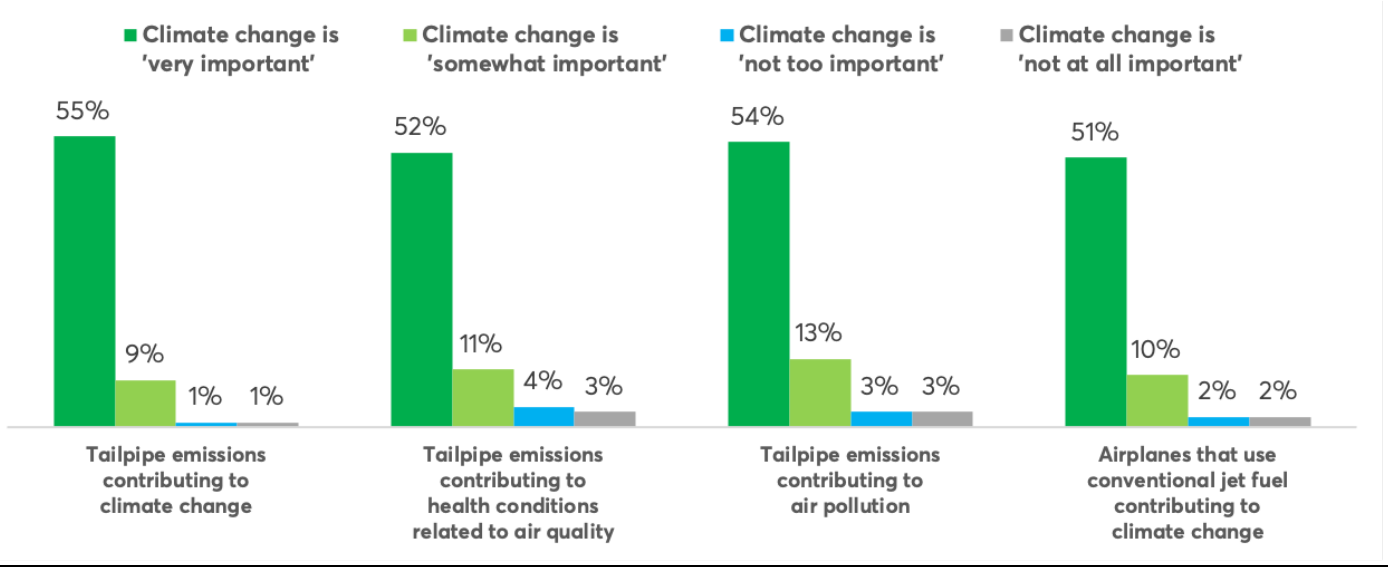
[20] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, and political affiliation.

LEVEL OF CONCERN ABOUT EMISSIONS BASED ON VIEWS TOWARDS CLIMATE CHANGE

Americans who say the **issue of climate change is personally 'very important'** to them are more likely than all other groups to say they are **'very concerned' about each of the emissions scenarios** we asked them about. [21]

For example, 55% of Americans **who say the issue of climate change is 'very important'** to them personally say they are '**very concerned' about vehicle tailpipe emissions contributing to climate change; this is** compared to **9% of Americans who say climate change is 'somewhat important'** to them and one percent of Americans who say climate change is 'not too' or 'not at all' important to them.

PERCENTAGE OF AMERICANS 'VERY CONCERNED' ABOUT EACH OF THE FOLLOWING EMISSIONS PROBLEMS



Base: Respondents who say they are 'very concerned' about each of the above emissions problems

[21] Differences are significant when controlling for gender, age, education, household income, race/ethnicity, urbanicity, region, and political affiliation.

LIKELIHOOD OF MAKING ENVIRONMENTALLY-FRIENDLY TRANSPORTATION CHOICES BASED ON VIEWS TOWARDS CLIMATE CHANGE

CHOOSING A VEHICLE & DECIDING ABOUT HOW TO GET TO AND FROM A DESTINATION

Four in 10 Americans who say the issue of climate change is 'very important' to them personally say impact on the environment is 'very important' to them **when buying or leasing a vehicle** (40%) and when deciding about **how to get to and from a destination** (39%). This is compared to four percent and 14%, respectively who say climate change is 'not at all important' to them personally.

IMPORTANCE OF IMPACT ON THE ENVIRONMENT WHEN MAKING THE FOLLOWING TRANSPORTATION CHOICES...		How important or not important to you personally is the issue of climate change?			
Buying or leasing a vehicle	**Total %**	**Not at all important %**	**Not too important %**	**Somewhat important %**	**Very important %**
Very important	18	4	4	7	40
Somewhat important	43	10	23	56	48
Not too important	25	20	50	30	11
Not at all important	14	66	23	7	2
Base: All respondents with not applicables removed from the base	7,403				
Deciding about how to get to and from a destination (such as walking, cycling, driving a car, rail, air travel, public bus, subway, etc.)					
Very important	23	14	9	15	39
Somewhat important	35	11	20	43	40
Not too important	26	17	43	32	17
Not at all important	16	58	27	10	4
Base: All respondents with not applicables removed from the base	7,314				

Nearly a quarter of Americans **(24%) who say climate change is 'very important' to them say they would definitely buy or lease an electric-only vehicle if they were to buy/lease a vehicle today** compared to only five percent of those who say climate change is 'not at all important' to them.

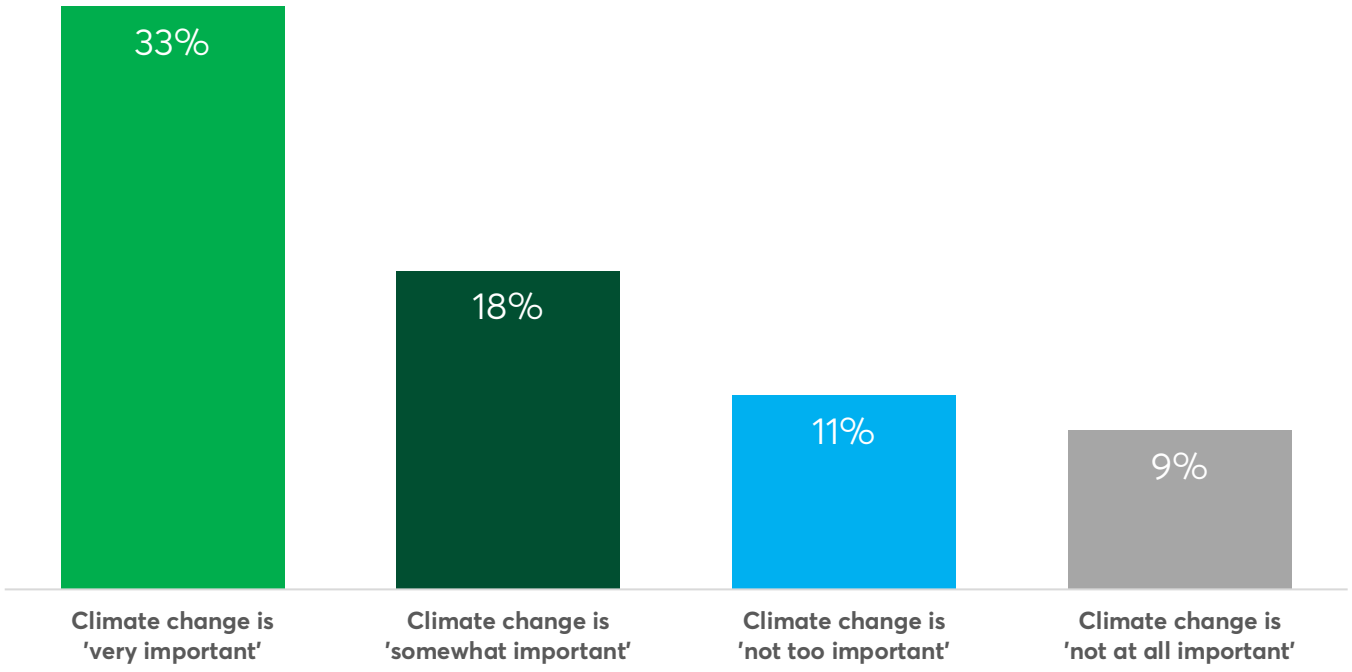
THOUGHTS ON BUYING/LEASING AN EV IF YOU WERE TO BUY OR LEASE A VEHICLE TODAY?		How important or not important to you personally is the issue of climate change?			
	Total %	**Not at all important %**	**Not too important %**	**Somewhat important %**	**Very important %**
I would definitely buy or lease an electric-only vehicle.	14	5	7	11	24
I would seriously consider buying or leasing an electric-only vehicle.	22	8	15	23	31
I might consider getting an electric-only vehicle in the future, but not If I were to buy or lease a vehicle today.	35	30	37	42	30
I would not consider getting an electric-only vehicle.	28	57	41	24	14
Base: All respondents	8,014				

USING PUBLIC TRANSPORTATION

Only **two in 10 Americans have used public transportation** (specifically, a public bus, train, or subway) **in the past six months** for getting around.

And, for those who have used it, a larger percentage of Americans who say climate change is 'very important' to them (33%) than those who say it is 'not at all important' to them (9%) say they use public transportation because ***"It's better for the environment***."

AMERICANS WHO SAY THEY USE PUBLIC TRANSPORATION BECAUSE 'IT'S BETTER FOR THE ENVIRONMENT'



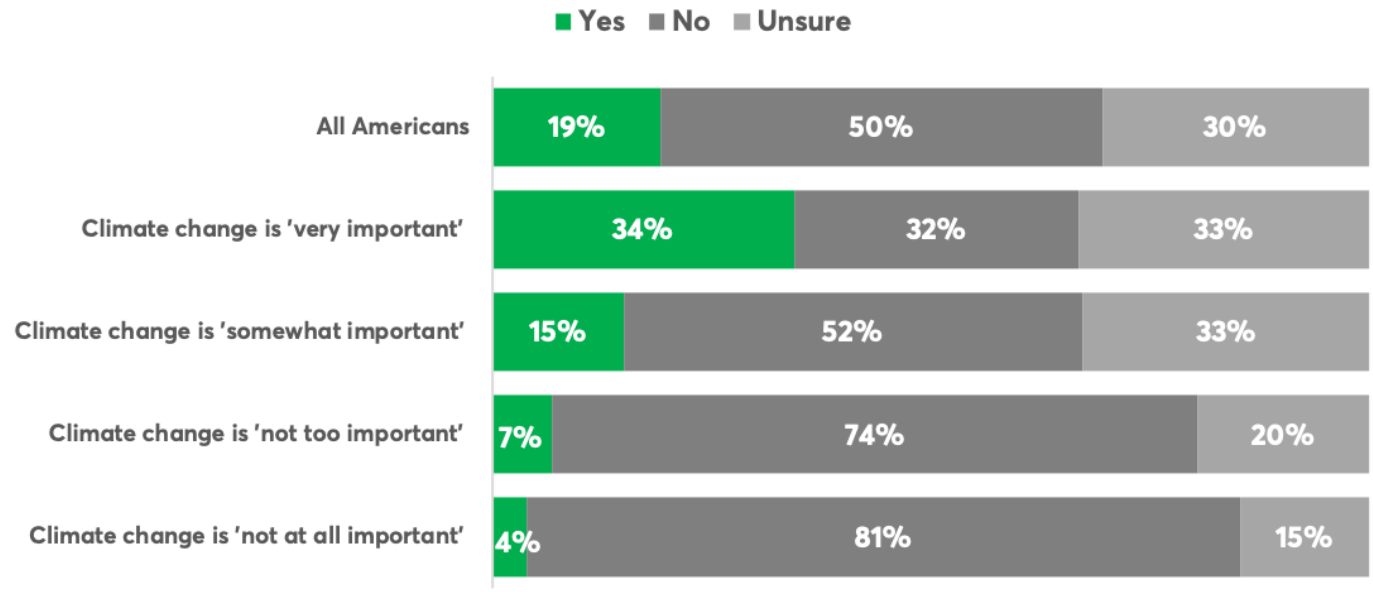
Base: Respondents who have used a public bus, train, or subway in the past six months

PAYING MORE FOR SHIPPING USING AN ELECTRIC-ONLY DELIVERY TRUCK

We asked respondents ***"While many online retailers provide free shipping to their customers, would you be willing to forego free shipping, or pay more when shopping at retailers where free shipping is not an option, if a company uses an electric-only delivery truck?"***

Overall, about two in 10 (19%) Americans who shop online say they would be willing to forego free shipping, or pay more when shopping at a retailer where free shipping is not an option, if a company uses an electric-only delivery truck. More than a third **(34%) of Americans who say climate change is 'very important'** to them personally say they are **willing to pay more for shipping** compared to just **four percent of Americans who say climate change is 'not at all important'** to them.

WILLINGNESS TO PAY MORE FOR SHIPPING USING AN ELECTRIC-ONLY DELIVERY TRUCK

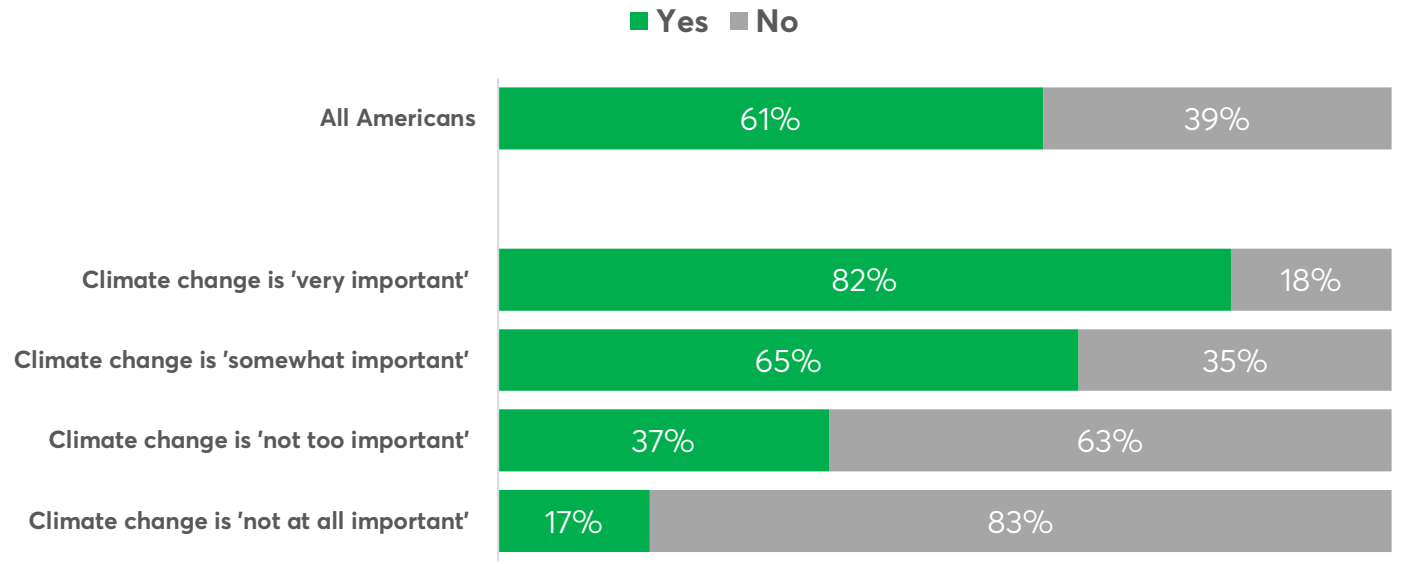


Base: All respondents with the exception of those saying 'not applicable' which were removed from the base

WILLING TO WAIT LONGER FOR SHIPPING USING AN ELECTRIC-ONLY DELIVERY TRUCK

Americans who shop online and say climate change is 'very important' to them not only are willing to pay more for shipping using an electric-only delivery truck, they are also willing to wait longer to receive a package to ensure it is shipped by an electric-only delivery truck. Eight in 10 **(82%) Americans who say climate change is 'very important'** to them will **wait longer compared to 17% of Americans who say climate change is 'not at all important' to them.**

WILLINGNESS TO WAIT LONGER FOR SHIPPING USING AN ELECTRIC-ONLY DELIVERY TRUCK



Base: All respondents with the exception of those saying 'not applicable' which were removed from the base

LOW CARBON FUELS IN VEHICLES

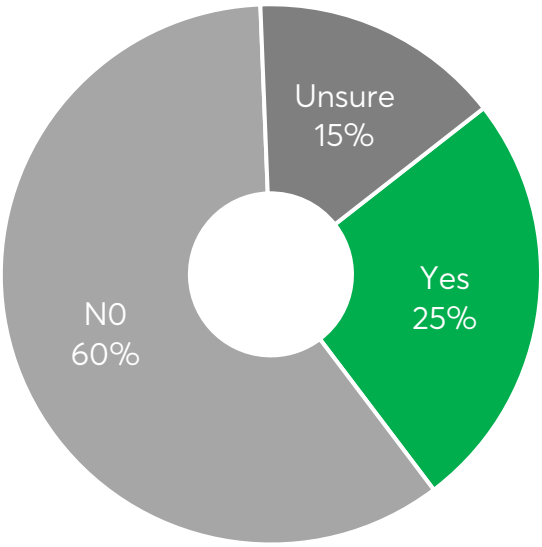
AWARENESS OF LOW CARBON FUELS FOR USE IN PERSONAL VEHICLES

Respondents were provided the following information:

> *"Alternative low carbon fuels are becoming more available in the US as an alternative to traditional petroleum-based fuels . The use of these fuels in vehicles can reduce the impact to the environment by at least 50% compared to traditional fuels.*
>
> *For the purpose of this survey we are asking about "drop-in fuels." These are low carbon fuels that can be used with your current vehicle. While much is unknown at the moment, we'd like to understand your thoughts on using these low-carbon fuels in your personal gasoline-powered vehicle."*

Overall, **one in four Americans say they have heard about the use of low carbon fuels in vehicles** before taking the survey.

BEFORE TAKING THIS SURVEY, HAD YOU HEARD ABOUT THE USE OF LOW CARBON FUELS IN VEHICLES?



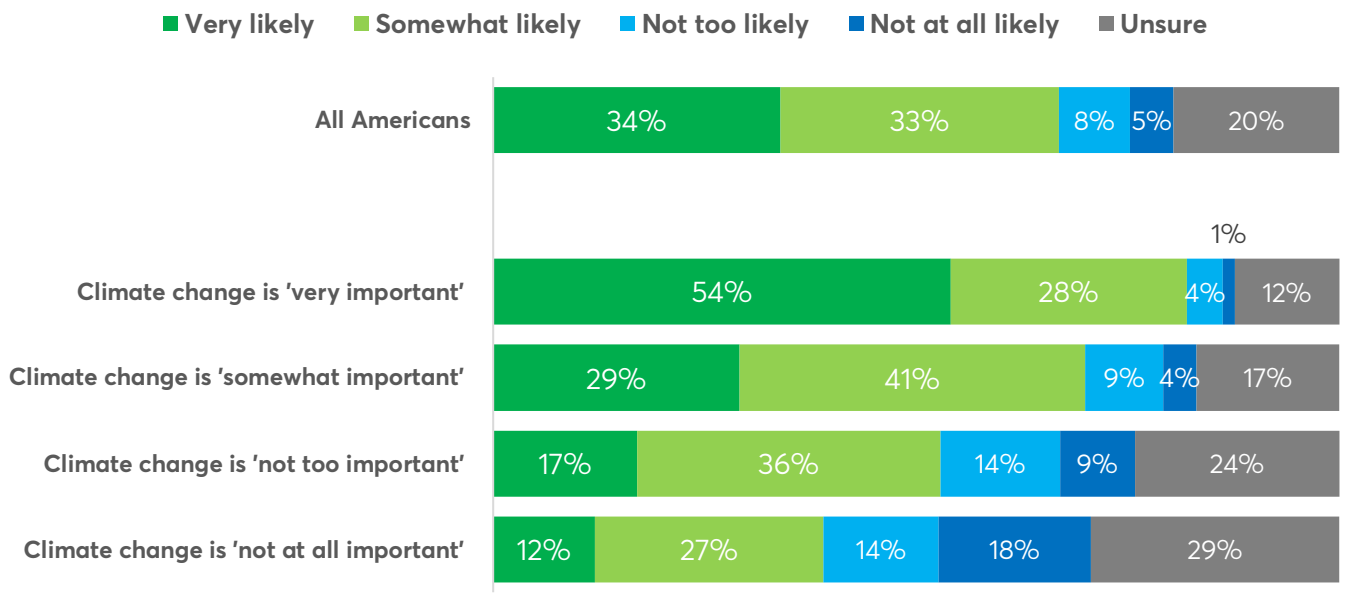
Base: All respondents

CHOOSING LOW CARBON FUELS AS AN ALTERNATIVE IN A PERSONAL VEHICLE

The importance of climate change as an issue had no effect on whether or not Americans are aware of low carbon fuels for use in personal vehicles or in airplanes.

However, Americans who say that climate change is **personally important to them** are more likely to say they **would use these low carbon fuels in their personal vehicle.** More than half of Americans (54%) who say climate change is 'very important' to them personally say they are 'very likely' use these low carbon fuels in their personal vehicles compared to 12% of Americans who say climate change is 'not at all important' to them.

LIKELIHOOD OF CHOOSING A LOW CARBON FUEL FOR YOUR PERSONAL VEHICLE INSTEAD OF TRADITIONAL FUEL



Base: All respondents with the exception of those who said 'not applicable' which were removed from the base

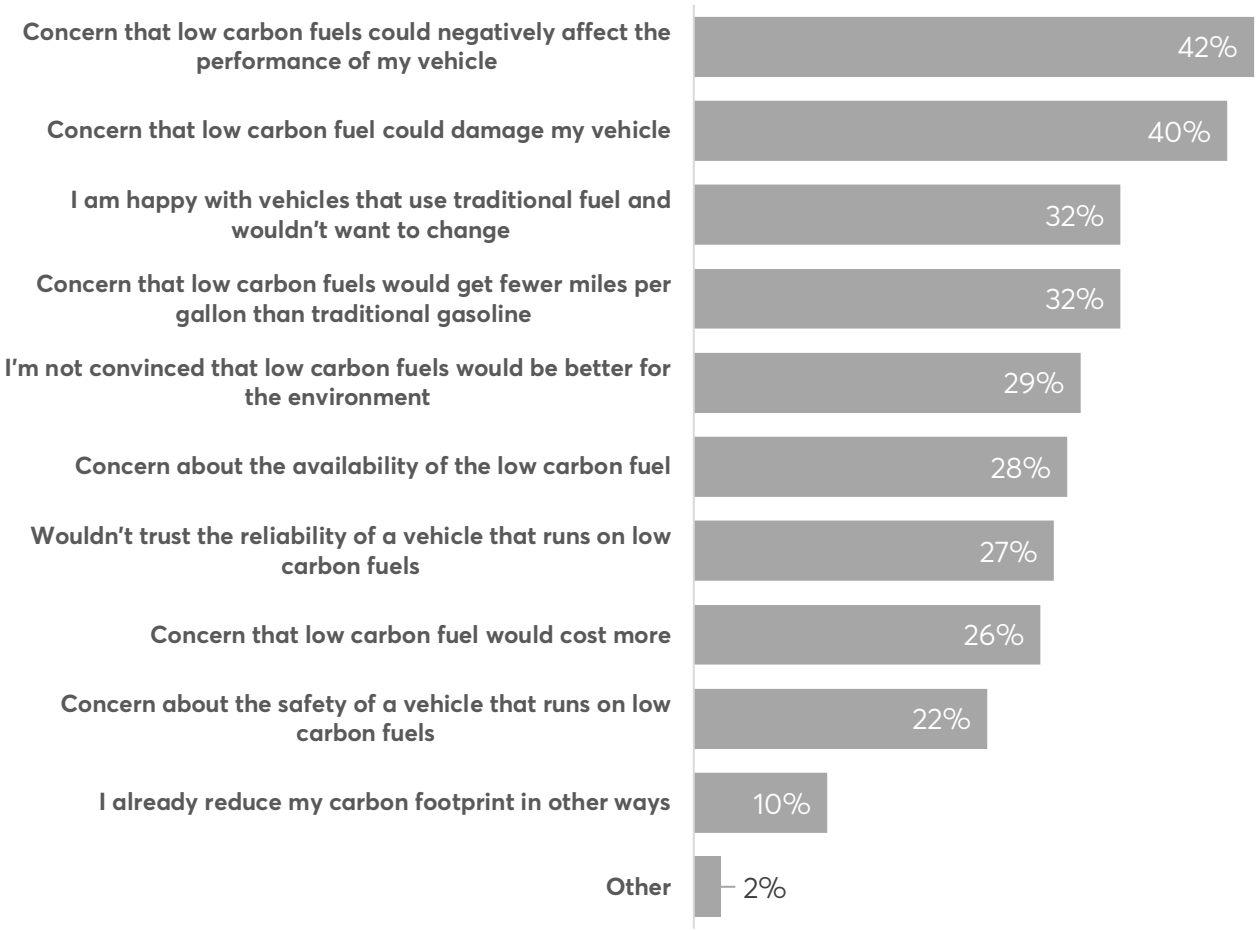
REASONS FOR NOT USING LOW CARBON FUELS AS AN ALTERNATIVE IN A PERSONAL VEHICLE

Overall, two-thirds of Americans **(67%) say they would likely use low carbon fuel in their personal vehicle** if the cost per gallon was the same as the cost for traditional fuel. Two in 10 Americans are unsure. Of the **14% of Americans who say they would be unlikely to use low carbon fuel** instead of traditional gasoline in their personal vehicle, we asked them why.

Four in 10 Americans who say they would be unlikely to use low carbon fuel in their personal vehicle say it's because of **"concern that low carbon fuels could negatively affect the performance of the vehicle" (42%) and "concern that low carbon fuel could damage the vehicle" (40%).**

Americans who **say that climate change is <u>not</u> important to them personally** are more likely than those who say climate change is important to them to say they would not use low carbon fuel in their vehicle because they are **"happy with vehicles that use traditional fuel and wouldn't want to change"** and they are **"not convinced it would be better for the environment."**

REASONS WHY AMERICANS WOULD BE UNLIKELY TO USE LOW CARBON FUEL INSTEAD OF TRADITIONAL GAS IN THEIR PERSONAL VEHICLE



Base: Respondents who said they would be unlikely to use low carbon fuel in their personal vehicle even if it was the same cost as traditional fuel.
Respondents selected all that apply.

LOW CARBON FUELS IN AVIATION

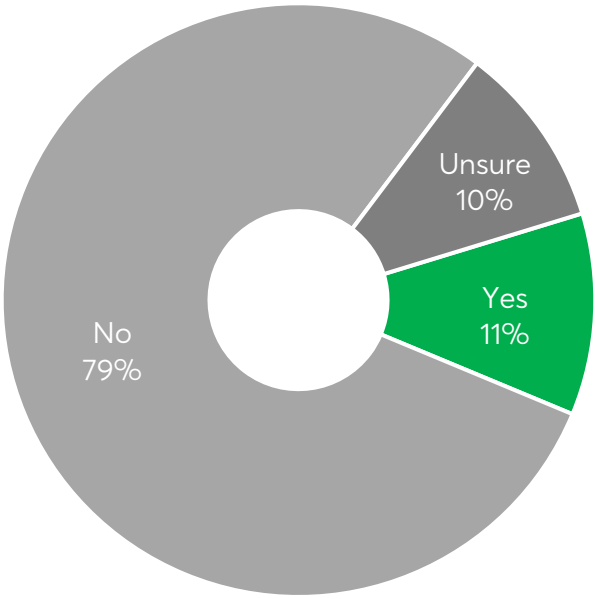
AWARENESS OF LOW CARBON FUELS FOR USE IN AVIATION

Respondents were provided the following information:

> *"Airlines are considering using more efficient fuel called sustainable aviation fuel (SAF). SAF is a renewable, low-carbon intensity substitute for conventional jet fuel. SAF is widely considered the best approach to rapidly reducing greenhouse gas emissions from commercial and business aviation. While this fuel is very new, we'd like to understand your thoughts on flying on airplanes that use these fuels."*

Overall, just one in 10 Americans **(11%) say they have heard about the use of sustainable aviation fuel (SAF)** in airplanes before taking the survey.

BEFORE TAKING THIS SURVEY, HAD YOU HEARD ABOUT THE USE OF SUSTAINABLE AVIATION FUEL IN AIRPLANES?



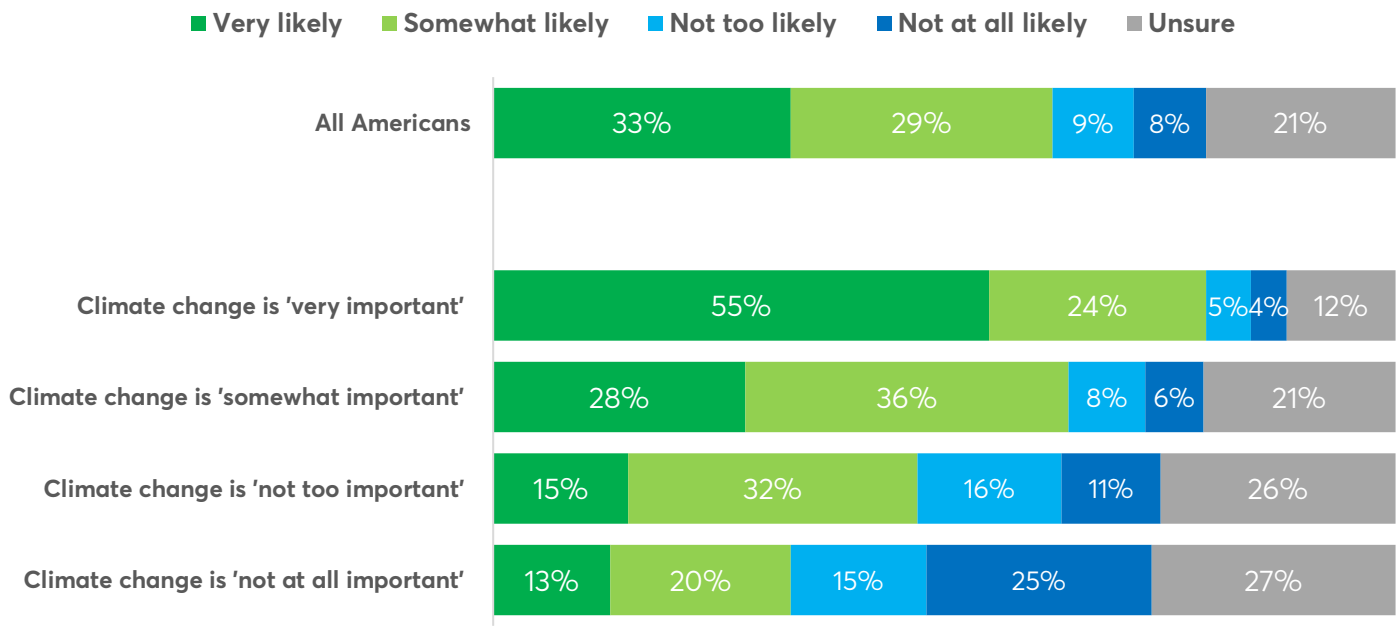
Base: All respondents

CHOOSING A FLIGHT ON A PLANE THAT USES LOW CARBON FUEL

Similarly, Americans who say climate change is personally important to them are more likely to say if they had a choice they would be more likely to choose a flight on a plane that uses low carbon fuel if the cost of the ticket was the same as flying on a plane that uses traditional jet fuel.

Overall, **a third of Americans** say they would be **'very likely' to choose a flight on a plane that uses low carbon fuel. Fifty-five percent** of Americans who say **climate change is 'very important'** to them say they would be **'very likely' to choose a flight on a plane that uses low carbon fuel** compared to **only 13%** of Americans who feel climate change is **'not at all important'** to them personally.

LIKELIHOOD OF CHOOSING A FLIGHT ON A PLANE THAT USES LOW CARBON FUEL IF THE COST OF THE TICKET WAS THE SAME AS FLYING ON A PLANE THAT USES TRADITIONAL JET FUEL



Base: All respondents

SUMMARY

WHERE WE STAND WITH EV ADOPTION

Only two percent of Americans currently own a battery-electric vehicle. **Fourteen percent** of Americans say they **would definitely** buy or lease an electric-only vehicle if they were to buy or lease a vehicle today. Another two in 10 **(22%)** say they **would seriously** consider it. More than a quarter **(28%)** say they **would not consider getting an electric-only vehicle.**

BARRIERS TO ADOPTION

The top three barriers reported by those who are reluctant to get an electric-only vehicle are **charging logistics,** the **number of miles the vehicle can go before it needs to be charged**, and the **costs** involved with buying, owning, and maintaining an EV. Interestingly, a much higher percentage of Americans who have never owned an EV than those who have report these as barriers. Therefore, it seems more likely to be an issue about lacking the correct information about electric-only vehicles, than real obstacles that should deter people from getting one.

MOST DESIRABLE ATTRIBUTES

While concern over costs is one of the top three perceived barriers, the **potential cost-savings with owning an EV landed among the top most desirable attributes of an EV**. Specifically, Americans said that costing less to charge than fueling a gas-powered vehicle, lower overall costs over the lifetime of the vehicle and lower maintenance costs than a gas-powered vehicle were all attributes that would most encourage them to get an EV.

WHAT 'DRIVES' POTENTIAL EV ADOPTERS?

Americans who say they are **more likely to buy an EV are clearly climate-forward enthusiasts**. They are more likely to say climate change is an issue that is personally important to them, they are more concerned about the dangers from vehicle and plane emissions, they feel they have more control over their personal impact on the environment and are willing to make environmentally-friendly transportation choices to reduce their impact on the environment as compared to those who are less likely to buy an EV.

Six in 10 Americans who say they would definitely buy or lease an EV say the climate change is a very important to them personally compared to just 18% of Americans who would not consider getting an EV. In addition, nearly half (49%) of Americans who say they would definitely buy or lease an electric-only vehicle say reducing their impact on the environment is one of the most important things to them when choosing a vehicle compared to 9% of Americans who would not consider buying or leasing an EV. Americans who are more likely to purchase an electric-only vehicle are also much more likely to say that they'd use low carbon fuels in their personal vehicles and if they had the choice would choose a flight on a plane that uses low carbon fuel.

WHAT NEEDS TO HAPPEN TO GET THE EV RELUCTANT 'ON BOARD'?

Fewer than one in 10 Americans say they are 'very familiar 'with the fundamentals of owning a battery-electric vehicle. There seems to be a genuine lack of information in the public about EVs. Not only are there, misconceptions about barriers but also the incentives available for EV owners. Nearly half of Americans have not heard about the incentives available for EV owners and the large majority of CURRENT EV owners haven't heard

of most of the incentives we asked about. Given that nearly three-quarters of Americans say the incentives that are available would encourage them to get an EV this is a missed opportunity. There is a real need for clear messaging about the fundamentals of owning an EV including the potential barriers, how to overcome them, desirable attributes of EVs, and lastly, incentives available for EV owners.

However, even with clear messaging and education, one of the top barriers that remains is the cost of purchasing, owning, and maintaining an EV. Moreover, with the cost of fuel today and supply chain issues, there has been a surge in the price of used EVs. Without some real changes in the market, the cost of EVs may still remain out of reach for the general population.

LOW CARBON FUELS

A **quarter of Americans have heard about the use of low carbon fuels in vehicles** and just **one in 10** have heard about them being used in **airplanes,** prior to taking the survey. Americans are quite receptive to the possibility of using these fuels in their own personal vehicles. **Two-thirds of Americans say they would be likely to use low carbon fuel instead of traditional gasoline** in their personal vehicle if the cost per gallon was the same as the cost for traditional fuel. Of those who say they would be unlikely to use low carbon fuels, four in 10 say they would be concerned that it could negatively affect the performance of the vehicle and/or a concern that it could damage the vehicle.

Similarly, **six in 10 Americans say if they had a choice, they would be likely to choose a flight on a plane that uses low carbon fuel.** For those who say they **would be unlikely to fly on a plane that uses this fuel,** about four in 10 say they are **happy with their current experience** and wouldn't want to change, they **wouldn't trust planes** that fly on this low carbon fuel to be as **safe,** and they **wouldn't trust the reliability of the service** of planes that fly on this fuel given the new technology.

Analogous to the likelihood of EV adoption, those who say climate change is important to them personally are more likely to be willing to adopt these new fuel changes into their transportation behaviors.

METHODOLOGY

This multi-mode survey was fielded by NORC at the University of Chicago using a nationally representative sample. The survey was conducted from January 27 – February 18, 2022. Interviews were conducted in English and in Spanish, and were administered both online and by phone.

A general population sample of U.S adults age 18 and older was selected from NORC's AmeriSpeak® Panel for this study. Funded and operated by NORC at the University of Chicago, AmeriSpeak® is a probability-based panel designed to be representative of the US household population. Randomly selected US households are sampled using area probability and address-based sampling, with a known, non-zero probability of selection from the NORC National Sample Frame. These sampled households are then contacted by US mail, telephone, and field interviewers (face to face). The panel provides sample coverage of approximately 97% of the U.S. household population. Those excluded from the sample include people with P.O. Box only addresses, some addresses not listed in the USPS Delivery Sequence File, and some newly constructed dwellings. While most AmeriSpeak households participate in surveys by web, non-internet households can participate in AmeriSpeak surveys by telephone. Households without conventional internet access but having web access via smartphones are allowed to participate in AmeriSpeak surveys by web. AmeriSpeak panelists participate in NORC studies or studies conducted by NORC on behalf of governmental agencies, academic researchers, and media and commercial organizations.

In total, NORC collected 8,027 interviews, 7,795 by web mode and 232 by phone mode, 7,820 in English and 207 in Spanish. The margin of error for the sample of 8,027 is +/- 1.59 percentage points at the 95% confidence level. Smaller subgroups will have larger error margins. In addition, we oversampled English-speaking Asian Americans. This sample of Asian Americans is composed of people from many different countries of origin and ethnicities, and all took the survey in English. Panelists were offered the cash equivalent of $2 after successfully completing the survey.

Final data are weighted by age, gender, race/Hispanic ethnicity, housing tenure, telephone status, education, and Census Division to be proportionally representative of the U.S. adult population. Key demographic characteristics (after weighting is applied) of this sample are presented below:

- 52% female
- Average age of 48 years old
- 62% White, Non-Hispanic
- 35% 4-year college graduates
- 57% have a household income of $50,000 or more

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Demographic details of EV experience.

		Gender		Age				Annual Household Income				Highest Education				
EV Experience Index	Total %	Male %	Female %	18-29 %	30-44 %	45-59 %	60+ %	Less than $30,000 %	$30,000 to $59,999 %	$60,000 to $99,999 %	$100,000 or more %	Less than High School %	High School Graduate %	Vocational/ Some College /Associates %	BA %	Graduate School %
0	46	36	56	40	39	50	54	58	50	45	31	50	58	49	36	30
1	27	31	24	31	29	25	25	23	29	30	27	28	24	29	29	28
2	16	19	13	18	18	15	14	10	14	15	25	12	12	15	19	24
3	7	9	5	8	9	6	6	6	5	7	11	7	4	6	11	10
4	4	5	2	3	5	4	2	3	2	3	6	4	2	2	5	7
Base: All respondents	*8,026*															

		Region				Urbanicity			Political Leaning			Race/Ethnicity			
EV Experience Index	Total %	Northeast %	Midwest %	South %	West %	Urban %	Suburban %	Rural %	Democrat or Lean Democrat %	Independent/ Don't Lean/None %	Republican or Lean Republican %	White, non-Hispanic %	Black, non-Hispanic %	Hispanic %	English-speaking Asian %
0	46	50	56	49	30	39	45	64	40	47	53	50	46	40	27
1	27	26	25	28	29	29	28	22	29	26	25	27	28	31	21
2	16	15	12	15	21	18	17	9	17	17	14	14	17	18	26
3	7	7	5	5	12	9	7	3	9	7	5	6	6	7	18
4	4	2	2	3	7	5	3	2	5	4	2	3	3	5	8
Base: All respondents	*8,026*														