

**Ready or Not:
An Analysis of Consumer Acceptance of Electric Vehicles**

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Abstract

ISEF Sample Abstract & Certification

Ready or Not: An Analysis of Consumer Acceptance of Electric Vehicles

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This study researched consumer acceptance of electric vehicles with regard to environmental impact, awareness of New York State regulatory action, the power source of currently owned vehicles and their preferences for future purchases, the availability of marketing information for electric vehicles, factors related to charging, and current government financial incentives. Data was collected through an original online survey, completed by 146 of approximately 1200 recipients. Raw data was analyzed using multiple mathematical methods and displayed using a variety of graphing techniques. 60.3% of the respondents are aware of the current regulatory action; however, 61.1% stated that their next vehicle purchase would be gas-powered, and 60% of the respondents indicated that their next vehicle purchase would be in 0-5 years. Also, 88.3% indicate beliefs ranging from neutral to completely disagree that they are able to purchase an electric vehicle with desired specifications at any time. With regard to government financial incentives, the majority, 77.3%, reported that incentives would influence their decision to purchase an electric vehicle. However, when the same respondents were asked if they consider government incentives when purchasing a vehicle, the majority, 58.9%, responded no they do not. The length of time and the availability of charging stations are highly influential as the majority stated they would install a home charging station. A further point highlighted that the majority of respondents believed that the environment is an important topic when determining the purchase of a vehicle.

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Introduction

Electric vehicles are a type of transportation that produce zero emissions and have increased in popularity in recent years. In the fall of 2022, New York State Governor Kathy Hochul signed legislation to increase the number of standalone electric vehicle charging stations through the reduction of obstacles facing individuals interested in installing such charging stations on private property. Alongside this legislation, Governor Hochul promoted a plan to ensure that by 2035, all new passenger vehicles sold in New York would produce zero emissions. It is currently believed that the implementation of this legislation will lead to less air pollution (notably, reduced carbon dioxide levels) and an improved air quality for citizens of New York State, among other benefits. To assist with the positive impacts of this legislation on society, research into consumer knowledge regarding preparedness for, and acceptance of electric vehicles is paramount. Discussions that may result from this research relate to promoting financial incentives when purchasing an electric vehicle, enhanced marketing strategies regarding features and options of available electric vehicles, and continued education on environmental impacts and regulatory actions.

Research has shown that there are 183 electric vehicles registered in Fulton County as of January 3, 2023 (NYSERDA, 2023). Additional research has shown that there are nine different charging station locations (Level 1, Level 2, DC Fast) found in the 11 zip code area that Fulton County, NY encompasses. This study researched the perceptions of consumers regarding electric vehicles who reside or work in Fulton County, NY. This research specifically examined the types of vehicles owned, the vehicle power sources, awareness of state legislation, and future purchasing preferences. Various mathematical analyses were used to examine the collected data.

Materials and Methods

Materials:

The materials used in this research study include an original, anonymous electronic survey created through the Google Forms web application, and a MacBook Air laptop computer for analysis and graphic design.

Methods:

An original survey consisting of 39 questions including qualitative and quantitative multiple choice, free response, Likert Scale response, and Factor Rating Method analysis was created. It was expected that participants would spend between five and seven minutes to complete the survey, with no risk or reward present. The local Scientific Review Committee/Institutional Review Board (SRC/IRB) determined that written informed consent was not required for participants 18 or older.

The voluntary electronic survey was distributed via email and the ParentSquare application. The survey population consisted of adults (18 or older) who drive, or own vehicles in upstate New York. The respondents are either currently employed at the Broadalbin-Perth Central School District or are parents of children that attend the Broadalbin-Perth Jr/Sr High School, grades 7-12. Approximately, 1200 adults received the survey. The survey was open for a period of two weeks.

The survey responses were reviewed on the Google Forms Responses collection form, and all 146 responses were accepted for all 39 questions. The data was analyzed using multiple mathematical methods and displayed using a variety of graphing techniques. Pie charts were used to divide multiple choice questions into raw data and percentages. Bar graphs were used to divide and show raw data and percentages for Likert Scale responses. The Likert Scales were a

range of five point responses under the categories of Completely Disagree (1), Somewhat Disagree (2), Neutral (3), Somewhat Agree (4), and Completely Agree (5). Text analysis was used to divide free response questions into categories and displayed on tables with qualitative and quantitative results. Factor Rating Method analysis was completed on questions linking Criteria and Alternatives. The process for Factor Rating Method involved the following steps; 1. Averaging the results of the Ranking Questions to obtain the Factor Rating; 2. Averaging the results of the Linking Questions to obtain Initial Scores; 3. Multiplying the Factor Rating with the Initial Scores to obtain the Total Scores; 4. Determining the sum of the Total Scores to obtain the Total Scores for each Alternative. The results were displayed in a table.

Results

The number of electronic surveys completed was a total of 146. The questions and results are as follow:

Question 1: Do you own or regularly use a vehicle? 100% of the respondents regularly use a vehicle.

Question 2: Which of these types of vehicles do you use the most? The top three responses were; SUV's (87 responses \approx 59.6%), Passenger Cars (34 responses \approx 23.3%), and Pickup Trucks (18 responses \approx 12.3%). (See *figure 1*).

Question 3: How many years do you typically own a car before replacing it? Please answer in terms of whole years (ex. 3, 12, 27). The top three responses were; 10 years (34 responses \approx 23.3%), 5 years (25 responses \approx 17.1%), and 3 years (19 responses \approx 13%). (See table 1).

Question 4: Is the vehicle you currently use gas-powered, electric-powered, or hybrid (gas or electric)? The three choices responses were; Gas-Powered (140 responses \approx 95.9%), Hybrid (4 responses \approx 2.7%), and Electric-Powered (2 responses \approx 1.4%). (See *figure 2*).

Question 5: The New York State Department of Environmental Conservation has been directed to take regulatory action that will require all passenger cars, pickup trucks, and SUVs sold in the state to be zero-emissions by 2035. Were you aware of this directive before this survey? The two options were; Yes (88 responses \approx 60.3%) and No (58 responses \approx 39.7%). (See *figure 3*).

Question 6: When do you plan on purchasing your next vehicle? The four multiple choice options were; 0-5 years (86 responses \approx 58.9%), 5-10 years (49 responses \approx 33.6%), 10-15 years (9 responses \approx 6.2%), and 15+ years (2 responses \approx 1.4%). (See *figure 4*).

Question 7: Which type of vehicle will your next purchase be? The three response options were; Gas-Powered (90 responses \approx 61.6%), Hybrid (40 responses \approx 27.4%), and Electric-Powered (16 responses \approx 11%). (See *figure 5*).

Question 8: I know the major differences between electric and gas vehicles. The Likert Scale responses in order of popularity were; Completely Agree (58 responses \approx 39.7%) Somewhat Agree (42 responses \approx 28.8%), Neutral (33 responses \approx 22.6%), Somewhat Disagree (13 responses \approx 8.9%), and Completely Disagree (zero responses = 0%). (See *figure 6*).

Question 9: Currently, enough information (types, features, brands, etc.) is available to help me in the purchase of an electric vehicle. The Likert Scale responses in order of popularity were; Neutral (56 responses \approx 38.4%), Somewhat Disagree (27 responses \approx 18.5%), Somewhat Agree (24 responses \approx 16.4%), Completely Disagree (20 responses \approx 13.7%), and Completely Agree (19 responses \approx 13%). (See *figure 7*).

Question 10: I am able to purchase an electric vehicle with my desired specifications at any time. The Likert Scale responses in order of popularity were; Completely Disagree (46 responses \approx 31.5%), Neutral (45 responses \approx 30.8%), Somewhat Disagree (38 responses \approx 26%), (10 responses \approx 6.8%) Completely Agree, and Somewhat Agree (7 responses \approx 4.8%). (See *figure 8*).

Question 11: I am willing to pay more for a vehicle if it is zero-emissions. The Likert Scale responses in order of popularity were; Completely Disagree (42 responses \approx 28.8%), Neutral (37 responses \approx 25.3%), Somewhat Agree (32 responses \approx 21.9%), Somewhat Disagree (25 responses \approx 17.1%), and Completely Agree (10 \approx 6.8%). (See *figure 9*).

Question 12: If I purchase an electric vehicle, I will install a home charging station. The Likert Scale responses in order of popularity were; Completely Agree (45 responses \approx 30.8%), Neutral (37 responses \approx 25.3%), Somewhat Agree (35 responses \approx 24%), Completely Disagree (21 responses \approx 14.4%), and Somewhat Disagree (8 responses \approx 5.5%). (See *figure 10*).

Question 13: The length of time to charge an electric vehicle will affect my decision to purchase a new or used electric vehicle. The Likert Scale responses in order of popularity were; Completely Agree (66 responses \approx 45.2%), Somewhat Agree (37 responses \approx 25.3%), Neutral (20 responses \approx 13.7%), Somewhat Disagree (13 responses \approx 8.9%), and Completely Disagree (10 responses \approx 6.8%). (See *figure 11*).

Question 14: How long would you expect the time to charge an electric vehicle to be? Please answer in terms of minutes or hours. The top three responses were; Less Than One Hour (19 responses \approx 13%), One Hour (11 responses \approx 7.5%), and Two Hours (10 responses \approx 6.8%). (See table 2).

Question 15: The availability of electric charging stations will affect my decision to purchase a new or used electric vehicle. The Likert Scale responses in order of popularity were; Completely Agree (67 responses \approx 45.9%), Somewhat Agree (36 responses \approx 24.7%), Neutral (22 responses \approx 15.1%), Completely Disagree (17 responses \approx 11.6%), and Somewhat Disagree (4 responses \approx 2.7%). (See *figure 12*).

Question 16: How often do you encounter electric charging stations in your daily life? The responses were grouped into five categories; Zero/Never (24 responses \approx 16.4%), Rarely/Not Often (55 responses \approx 37.7%), Not Sure (17 responses \approx 11.6%), Often (24 responses \approx 16.4%), and Daily (26 responses \approx 17.8%). (See table 3).

Question 17: New York State's plan to only produce zero-emission vehicles by 2035 will affect my decision to purchase a new or used electric vehicle. The Likert Scale responses in order of popularity were; Neutral (48 responses \approx 32.9%), Somewhat Agree (35 responses \approx 24%), Completely Agree (31 responses \approx 21.2%), Completely Disagree (21 responses \approx 14.4%), and Somewhat Disagree (11 responses \approx 7.5%). (See *figure 13*).

Question 18: How do you feel about New York State's plan? The responses were grouped into three opinion groups; Disagree (62 responses \approx 42.5%), Neutral (40 responses \approx 27.4%), and Agree (44 responses \approx 30.1%). (See table 4).

Question 19: The environmental impacts of zero-emission vehicles will affect my decision to purchase a new or used electric vehicle. The Likert Scale responses in order of popularity were; Neutral (48 responses \approx 32.9%), Somewhat Agree (45 responses \approx 30.8%), Completely Agree (25 responses \approx 17.1%), Completely Disagree (22 responses \approx 15.1%), and Somewhat Disagree (6 responses \approx 4.1%). (See *figure 14*).

Question 20: How do you feel about the environmental impacts of vehicles? Please briefly describe. The responses were grouped into five opinion categories; Not Worried About The Environment (33 responses \approx 22.6%), Safety Issues Involving Electric Vehicles (14 responses \approx 9.6%), Environmental Impacts is an Important Topic (45 responses \approx 30.8%), Something Needs To Be Done (42 responses \approx 28.8%), and 100% Electric Vehicles Now (12 responses \approx 8.2%). (See table 5).

Question 21: State or government incentives related to the purchase of an electric vehicle will affect my decision to purchase a new or used electric vehicle. The Likert Scale responses in order of popularity were; Somewhat Agree (50 responses \approx 34.2%), Neutral (33 responses \approx 22.6%), Completely Agree (30 responses \approx 20.5%), Completely Disagree (23 responses \approx 15.8%), and Somewhat Disagree (10 responses \approx 6.8%). (See *figure 15*).

Question 22: Do you consider state or government incentives when planning to purchase any new or used vehicle? The responses were separated into two opinion groups; No (86 responses \approx 58.9%), and Yes (60 responses \approx 41.1%). (See *table 6*).

Questions 23-39: The Factor Rating Method was used to analyze four criteria and four alternatives to determine the most desired alternative(s). The four criteria were; Low Purchase Price, Short Fueling Time, Low Cost of Fuel/Energy, and Positive Environmental Impacts. The four alternatives were; New Gas-Powered Vehicle, Used Gas-Powered Vehicle, New Electric-Powered Vehicle, and Used Electric-Powered Vehicle. The results indicated that the respondents desired all four alternatives similarly, when considering the four criteria used in the analysis. (See *table 7*).

Discussion

“As many markets shift to greater levels of electrification, we expect vehicle pricing to be pressured to the upside, presenting a headwind to demand in the short-to-intermediate term. Longer-term questions remain, especially regarding charging infrastructure, grid power, battery supply chains, and the appropriate level of policymaker support to help smooth the transition

from fossil fuel vehicles to electric vehicles” (S&P, 2023). New York State (NYS) is moving toward clean transportation with less reliance on fossil fuels, and Governor Kath Hochul is providing new and ongoing investments to include advances in infrastructure for electric vehicles and purchasing incentives (rebates) for zero-emission vehicles (Hochul, 2022). Additionally, by 2035 regulatory action will require all new passenger vehicles sold in New York to produce zero-emissions. The results of this study indicate that more than half (60.3%) of the respondents are aware of this current regulatory action; however, that leaves approximately 39.7% of the respondents unaware of the changes coming down the road in just over ten years. Furthermore, approximately 70% of the respondents disagree with the NYS plan for zero-emissions. This puts NYS in a clear position to increase state-wide community outreach. Current sources of information for legislative action include social-media postings, financial advisors, radio, televised and printed news feeds, and the NYS Governor’s Pressroom releases, to name a few. Ideally, increased publicity would in turn increase public awareness and possible agreement and acceptance. Interestingly, approximately 80% of the respondents indicated that the NYS plan to produce zero-emission vehicles by 2035 will positively affect their decision to purchase an electric vehicle. This is a step in the right direction to reducing greenhouse gas emissions.

The current study revealed SUVs, passenger cars, and pickup trucks are the dominant vehicles driven by the respondents, and over 95% of those vehicles are fully gas-powered. The research also revealed that the respondents owned their cars between 3 years (13%) to 10 years (23.3%); however, just under 60% of the respondents indicated that they will purchase their next vehicle within 0-5 years. These results highlight that the respondents are on the tail end of ownership regarding their current vehicle. Furthermore, when asked about the power source of their next vehicle, there was a 34.3% decrease for the purchase preference of gas-powered

vehicles, leaving 61.6% purchasing gas-powered vehicles in the future. Which in turn, increased the anticipated purchase of hybrid-powered or electric-powered vehicles by 34.3%. These findings are consistent with national trends, “[Electric Vehicles] EV sales grew by 85% from 2020 to 2021, while sales of [Plug-in Hybrid Electric Vehicles] PHEVs more than doubled, with an increase of 138% over the previous year” (Minos, 2022). Even after knowing about the new regulatory action, many residents still plan on buying gas-powered vehicles. Based upon the typical length of ownership, many may buy at least one if not two new gas-powered vehicles before the regulatory action goes into effect in 2035.

Commonly known differences between gas-powered vehicles and electric-powered vehicles include: gas-powered vehicles have hundreds of moving parts to create energy and move the vehicle; electric vehicles have a battery; fuel economy and fuel capacity increase the range for gas-powered vehicles; electric batteries limit the range; and the average fueling time at a gas pump is measured in minutes compared to the average charging time at an electric charging station, which is measured in hours (“3 Major Differences”, 2023). The findings of this study show that the majority of the respondents, 68.5%, somewhat or completely agree that they know the major differences between electric-powered and gas-powered vehicles. However, there are many more differences between these two types of vehicles regarding features such as; safety, style, accessories/options, availability, and pricing. This is highlighted in the results of this study where the majority of the respondents, 38.4%, indicated “neutral” status regarding the availability of the information about electric vehicles and their features. Furthermore, the vast majority of the respondents, 88.3%, indicate beliefs ranging from “neutral” to “completely disagree” that they are able to purchase an electric vehicle with desired specifications at any time. While specific features and vehicle specifications were not designated in this study to gain

further insight, it is known that EV batteries can cut into passenger and cargo space, not all dealerships sell electric vehicles, availability may be limited in certain states, traditional home maintenance is difficult, and replacement parts can be expensive (Loveday, 2022). Interestingly, the results from the Factor Rating Method analysis also revealed that there was no significant difference between the criteria; Low Purchase Price, Short Fueling Time, Low Cost of Fuel/Energy, and Positive Environmental Impacts, and the purchase of new/used gas-powered or electric-powered vehicles. Further studies into features and desired specifications may reveal worthy information.

The 146 survey respondents were asked if government incentives will influence their decision to purchase an electric vehicle. The results revealed that the majority, 77.3%, indicated “neutral” beliefs, “somewhat agree”, or “completely agree” with there being an influence on their decision to purchase an electric vehicle. Interestingly, when the same respondents were asked if they consider government incentives when purchasing a vehicle of any power source, the majority, 58.9%, responded “no” they do not. In this free response question, a sampling of replies includes: I have never considered them; I did not know they existed; and I do not meet the qualifications. Currently, “The Charge NY initiative offers electric car buyers the Drive Clean Rebate of up to \$2,000 for new car purchases or leases” (NYSERDA, 2023). Additionally, “credit up to \$7,500 under Internal Revenue Code Section 30D if you buy a new, qualified plug-in EV or fuel cell electric vehicle (FCV)” (IRS, 2023). In light of this discrepancy between knowledge and use of incentives and the availability of incentives, more information needs to be publicized by NYS and the Federal Government as a step toward increasing public knowledge.

As noted previously, one of the major differences between a gas-powered vehicle and an electric-powered vehicle is the length of time required to fuel. The expected length of time to

charge an electric vehicle varies, and 13% of respondents of this survey indicated that the expected time would be less than one hour, 7.5% indicated that the expected time would be one hour, and 6.8% indicated that the expected time would be two hours. The remainder of the respondents believed that the expected time to charge an electric vehicle would be between 3 and 30 hours. Additionally, the majority of respondents, 70.5%, indicated that the length of time to charge an electric vehicle would impact their decision to purchase an electric vehicle. The U.S. Department of Transportation highlighted three levels of charging speed; Level 1 (40-50 hours to fully charge), Level 2 (4-10 hours to fully charge), and Direct Current Fast Charging (DCFC) (80% charge in 20 minutes to one hour) (2022). These charging stations are located in residential homes, workplaces, at public locations, and along heavy-traffic highways. The majority of respondents, 70.6%, further indicated that the availability of electric charging stations would influence their decision to purchase an electric vehicle. The results also show that 54.1% of the respondents “never” or “rarely” encounter a charging station in their daily life, which suggests why the majority, 80.1%, prefer to install a home charging station after the purchase of an electric vehicle.

Finally, the respondents were presented with questions regarding purchasing zero-emissions vehicles and the environmental impact of vehicles. The results indicate 30.8% of the respondents believe the environmental impact of vehicles is an important topic, 28.8% believe that something needs to be done, and 8.2% are in full support of electric vehicles. The U.S. Environmental Protection Agency reports, “that an EV is typically responsible for lower levels of greenhouse gases (GHGs) than an average new gasoline car” and “over the lifetime of the vehicle, total GHG emissions associated with manufacturing, charging, and driving an EV are typically lower than the total GHGs associated with a gasoline car” (2023). Interestingly,

32.2% of the respondents indicated that they were not worried about the environment or the safety issues affiliated with electric vehicles (fires, pollution, disposal of batteries) were most important. This is concurrent with the Factor Rating Method analysis, which failed to reveal a standout alternative between new/used gas-powered and electric-powered vehicles.

Conclusion

An original survey of 39 questions including qualitative and quantitative multiple choice, free response, Likert Scale response, and Factor Rating Method analysis was completed by 146 of approximately 1200 recipients. The highlighted topics were: awareness of NYS regulatory action to ensure that by 2035 all new passenger vehicles sold in New York would produce zero-emissions; purchasing preferences between gas-powered and electric-powered vehicles; availability of information to make informed decisions; the availability of government incentives; the length of time to charge an electric vehicle; and the perceived environmental impacts of electric vehicles. This study found that more than half (60.3%) of the respondents are aware of this current regulatory action; however, 61.1% stated that their next vehicle purchase would be gas-powered, and 60% of the respondents indicated that their next vehicle purchase would be in 0-5 years. Furthermore, the vast majority of the respondents, 88.3%, indicate that they are unable to purchase an electric vehicle with desired specifications at this time. With regard to government financial incentives the majority, 77.3%, reported that incentives would influence their decision to purchase an electric vehicle. However, when the same respondents were asked if they consider government incentives when purchasing a vehicle, the majority, 58.9%, responded “no” they do not. Additionally, the length of time and the availability of charging stations are highly influential as the majority stated they would install a home charging

station. A further point highlighted that the majority of respondents believed that the environment is an important topic when determining the purchase of a vehicle. Finally, when considering consumer acceptance of electric vehicles, numerous topics remain to be researched and promoted including the marketing of NYS regulations and vehicle financial incentives, plans for infrastructure growth, consumer preferences for specifications and accessories associated with electric vehicles, and continued representation of the environmental benefits of zero-emissions.

Appendix

Table 1. How many years do you typically own a car before replacing it?

Number of Years Before Replacing Vehicle	Number of Responses
2 years	4 \approx 2.7%
3 years	19 \approx 13%
4 years	6 \approx 4.1%
5 years	25 \approx 17.1%
6 years	16 \approx 11%
7 years	10 \approx 6.8%
8 years	13 \approx 8.9%
9 years	1 \approx 0.7%
10 years	34 \approx 23.3%
12 years	3 \approx 2.1%
13 years	1 \approx 0.7%
14 years	3 \approx 2.1%
15 years	7 \approx 4.8%
20 years	1 \approx 0.7%
Until it dies	3 \approx 2.1%

Table 2. How long would you expect the time to charge an electric vehicle to be?

Expected Time To Charge An Electric Vehicle	Number of Responses
0 hours	2 \approx 1.4%
Less than 1 hour	19 \approx 13%
1 hour	11 \approx 7.5%
2 hours	10 \approx 6.8%
3 hours	5 \approx 3.4%
4 hours	7 \approx 4.8%
5 hours	2 \approx 1.4%
6 hours	5 \approx 3.4%
8 hours	6 \approx 4.1%
10 hours	4 \approx 2.7%
12 hours	3 \approx 2.1%
30 hours	1 \approx 0.7%
No Clue	2 \approx 1.4%

Table 3. How often do you encounter electric charging stations in your daily life?

Frequency of Encounters	Number of Responses
Zero/Never	24 \approx 16.4%
Rarely/Not Often	55 \approx 37.7%
Not Sure	17 \approx 11.6%
Often	24 \approx 16.4%
Daily	26 \approx 17.8%

Table 4. How do you feel about New York State's plan?

Opinion Categories	Number of Responses
Disagree	62 \approx 42.5%
Neutral	40 \approx 27.4%
Agree	44 \approx 30.1%

Table 5. How do you feel about the environmental impacts of vehicles?

Opinion Categories	Number of Responses
Not Worried About The Environment	33 \approx 22.6%
Safety Issues Involving Electric Vehicles	14 \approx 9.6%
Environmental Impact is an Important Topic	45 \approx 30.8%
Something Needs To Be Done	42 \approx 28.8%
100% Electric Vehicles Now	12 \approx 8.2%

Table 6. Do you consider state or government incentives when planning to purchase any new or used vehicle?

Opinion Categories	Number of Responses
No	86 \approx 58.9%
Yes	60 \approx 41.1%

Table: 7. Results From The Factor Rating Method Analysis.

		New Gas-Powered Vehicle		Used Gas-Powered Vehicle		New Electric-Powered Vehicle		Used Electric-Powered Vehicle	
Criteria	Factor Rating	Initial Score	Weighted Score	Initial Score	Weighted Score	Initial Score	Weighted Score	Initial Score	Weighted Score
<i>Low Purchase Price</i>	2.64	3.58	9.45	3.86	10.19	3.17	8.37	3.32	8.76
<i>Short Fueling Time</i>	2.31	3.23	7.46	3.05	7.05	3.30	7.62	3.22	7.44
<i>Low Cost of Fuel / Energy</i>	2.70	3.54	9.56	3.38	9.13	3.74	10.10	3.58	9.67
<i>Positive Environmental Impacts</i>	2.34	3.05	7.14	2.86	6.69	3.70	8.66	3.53	8.26
		Total: 33.61		Total: 33.05		Total: 34.75		Total: 34.13	

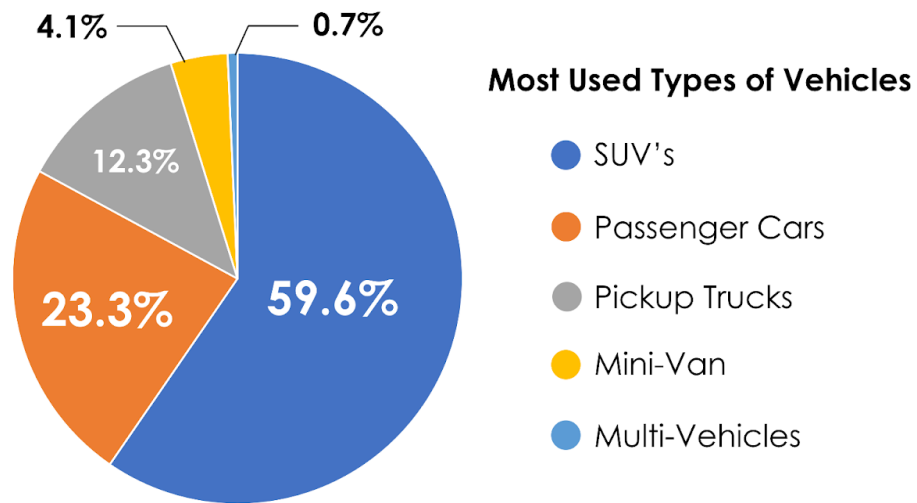


Figure 1. Types of vehicles most used by the 146 respondents.

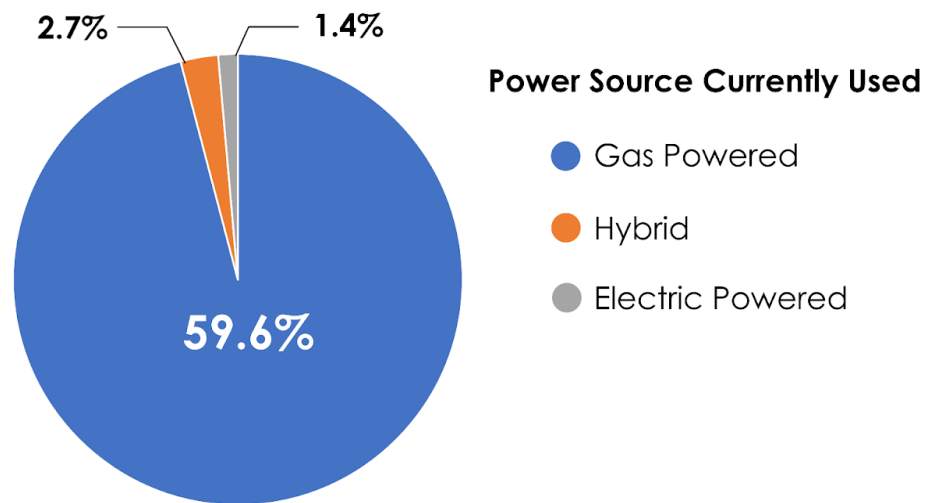


Figure 2. Power sources of the currently used vehicles of the 146 respondents.

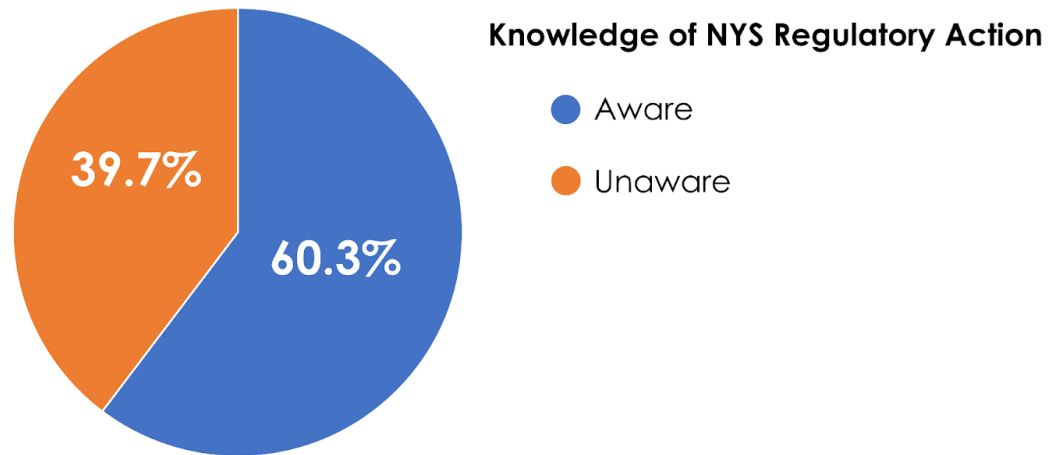


Figure 3. Awareness of New York State Department of Environmental Conservation Regulatory Action.

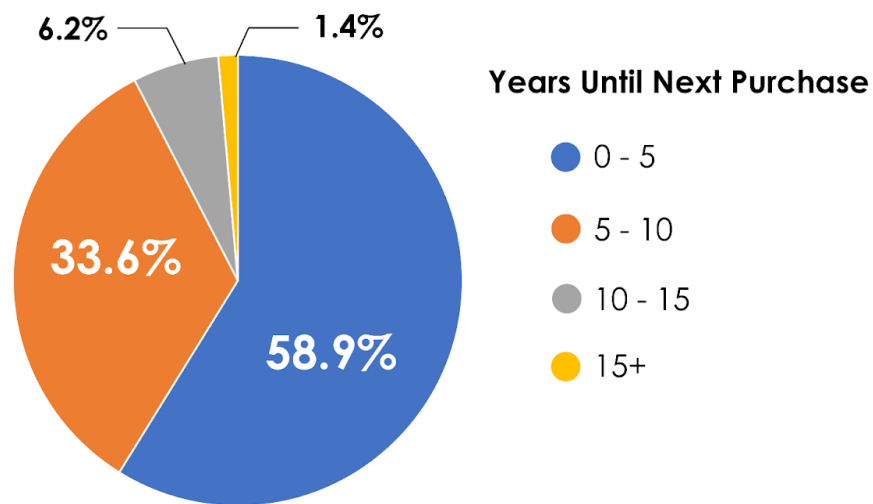


Figure 4. The number of years indicated until the next vehicle purchase.

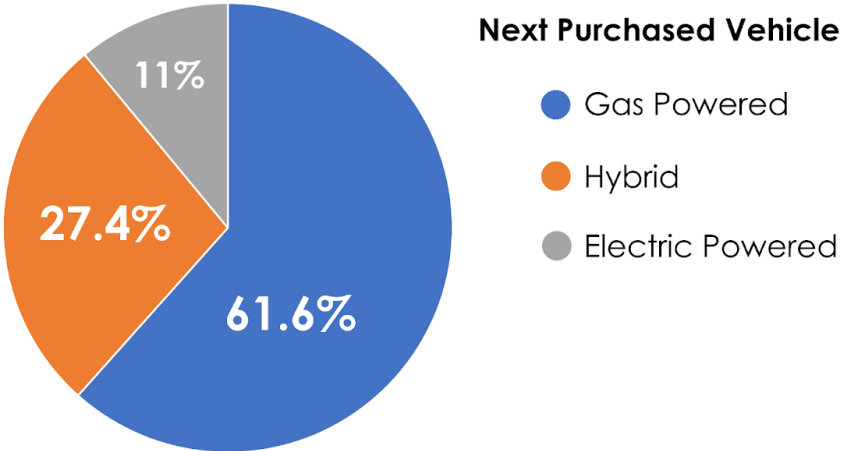


Figure 5. The power source of the next purchased vehicle.

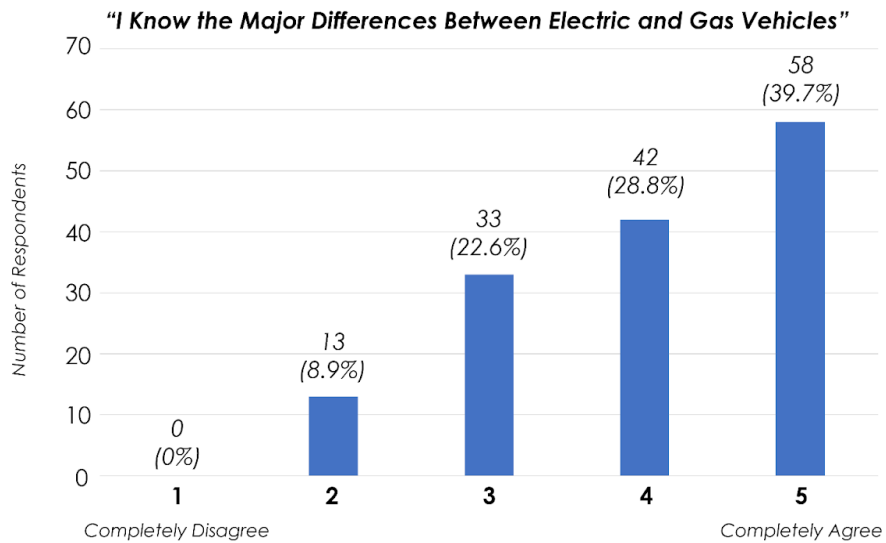


Figure 6. I know the major differences between electric and gas vehicles.

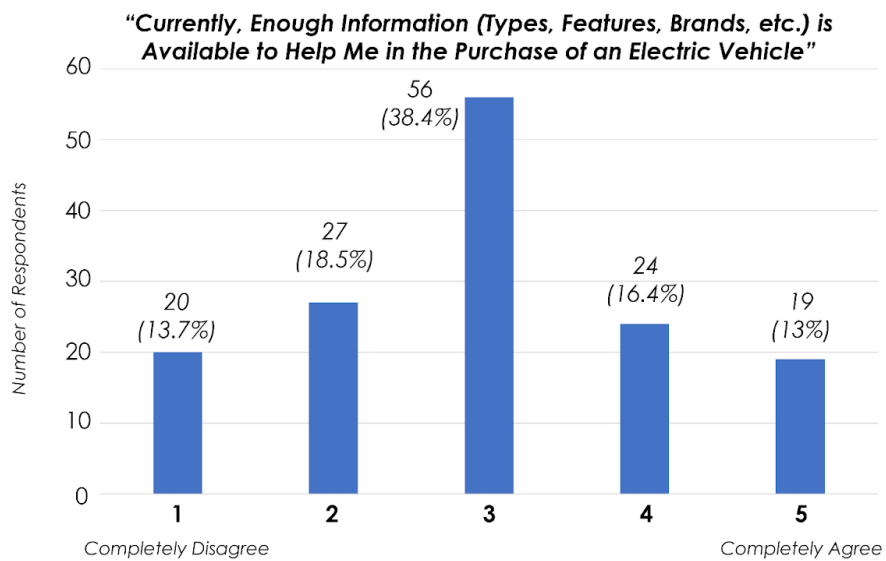


Figure 7. Information about electric vehicles and their features is available to aid in purchasing.

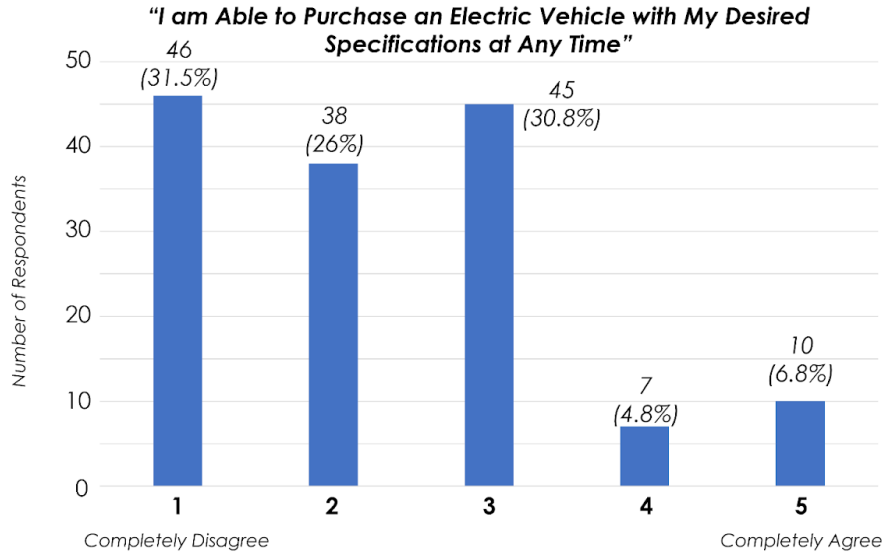


Figure 8. The ability to purchase an electric vehicle with the desired specifications at any time.

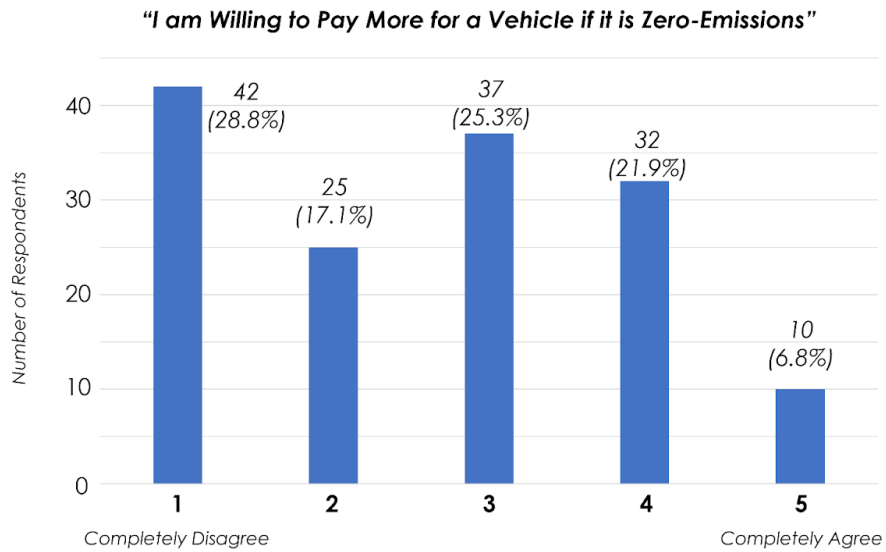


Figure 9. Willingness to pay more for a zero-emission vehicle.

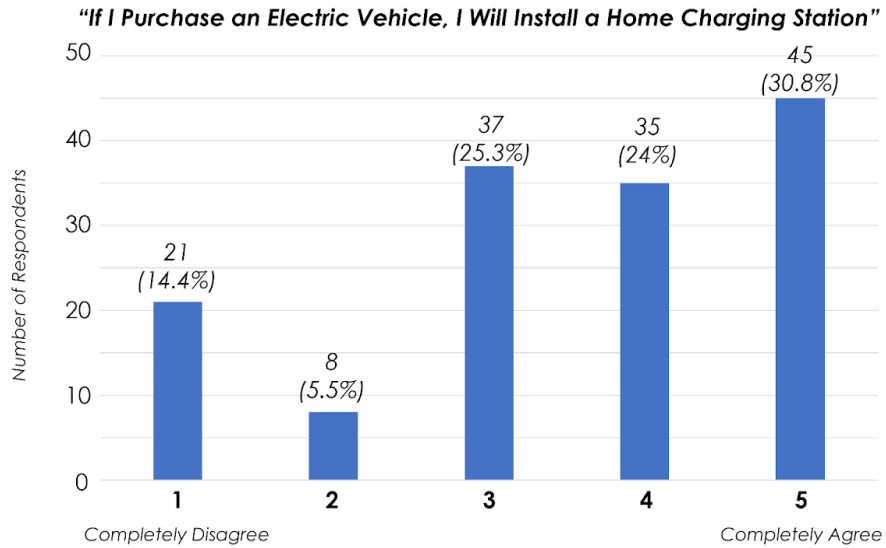


Figure 10. The preference for installing a home charging station if an electric vehicle is purchased.

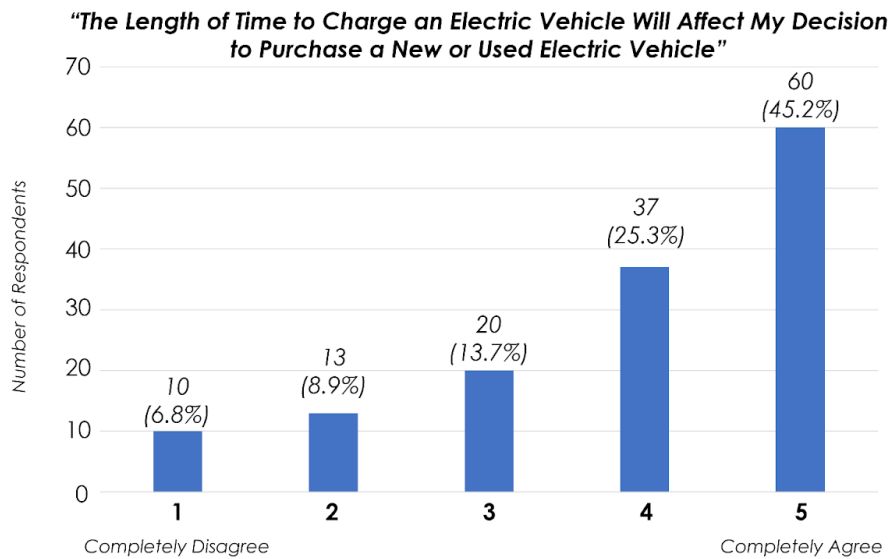


Figure 11. The length of time to charge an electric vehicle will affect one's decision to purchase an electric vehicle.

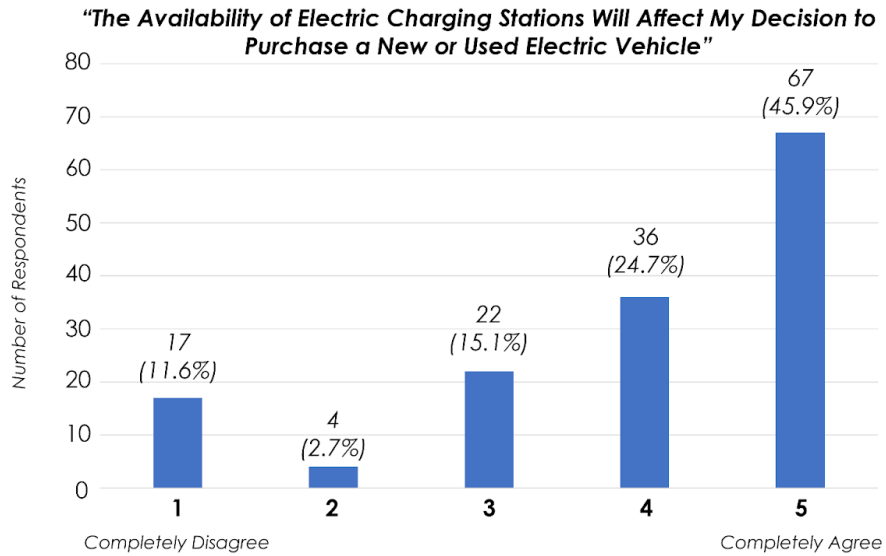


Figure 12. The effects of the availability of electric charging stations on the decision to purchase.

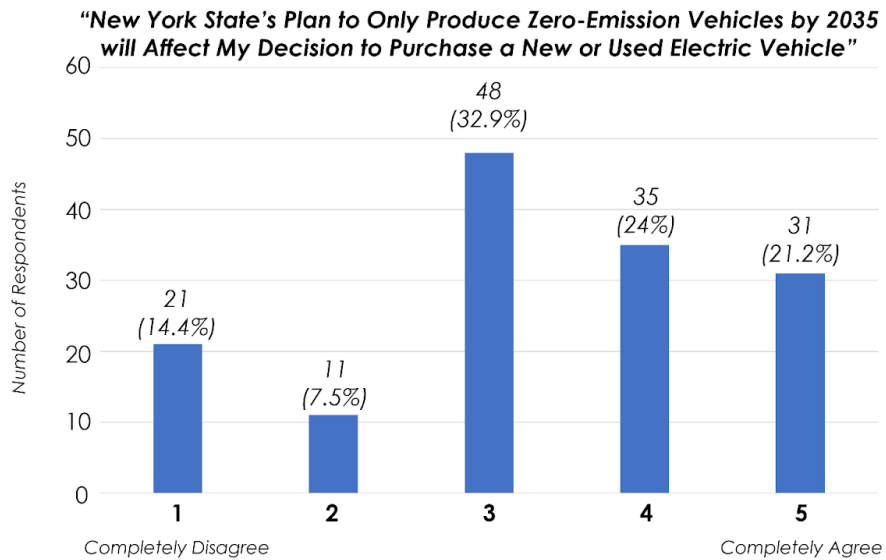


Figure 13. The effect of New York State’s plan to only produce zero-emissions vehicles by 2035 on the decision to purchase an electric vehicle.

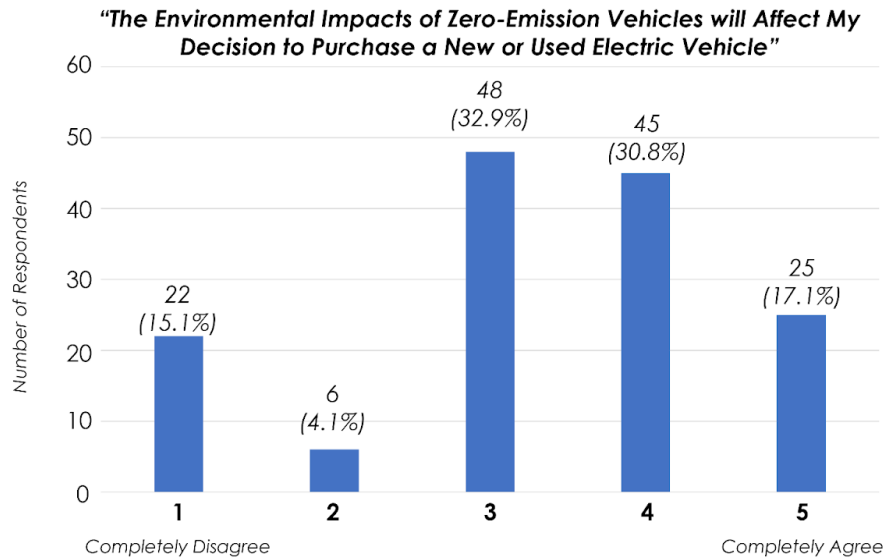


Figure 14. The effects of the environmental impacts of zero-emission vehicles on the decision to purchase an electric vehicle.

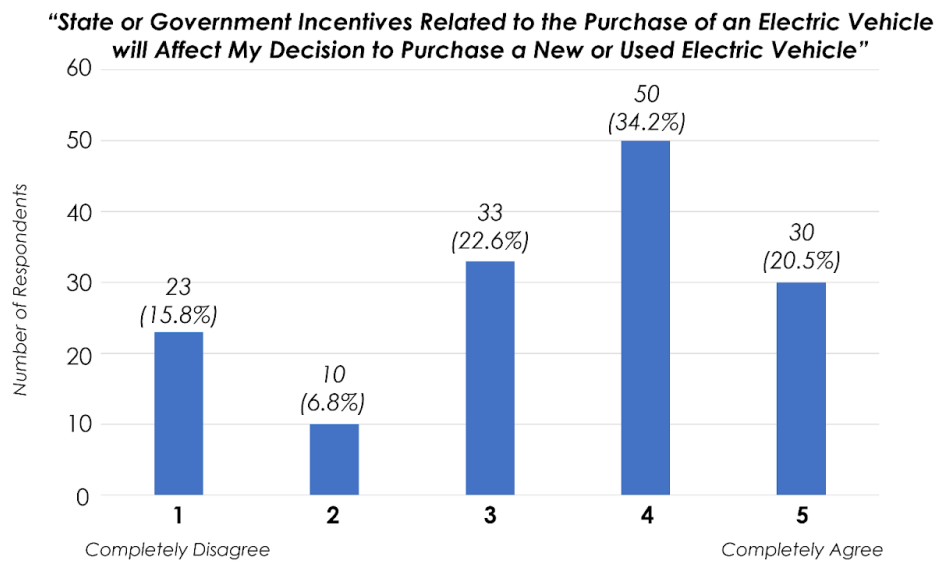


Figure 15. The effects of state or government incentives on the decision to purchase an electric vehicle.

Bibliography

3 major differences between electric cars and gas-powered cars. (n.d.).

<https://simpletire.com/learn/tire-news-information/3-major-differences-electric-cars-gas-powered-cars>

Charge NY. NYSERDA. (n.d.).

<https://www.nysenda.ny.gov/All-Programs/ChargeNY/Support-Electric/Map-of-EV-Registration>

Drive clean rebate for Electric Cars. NYSERDA. (n.d.).

<https://www.nysenda.ny.gov/All-Programs/Drive-Clean-Rebate-For-Electric-Cars-Program>

Drive clean rebate for Electric Cars. NYSERDA. (n.d.).

<https://www.nysenda.ny.gov/All-Programs/Drive-Clean-Rebate-For-Electric-Cars-Program#:~:text=Drive%20Clean%20Rebate%20for%20Plug%2DIn%20Electric%20Cars&text=The%20Charge%20NY%20initiative%20offers,wouldn't%20want%20to%20miss>

Governor Hochul drives forward New York's transition to Clean Transportation. Governor Kathy Hochul. (n.d.).

<https://www.governor.ny.gov/news/governor-hochul-drives-forward-new-yorks-transition-clean-transportation>

Governor Hochul signs legislation to advance New York's transition to Clean Transportation.

Governor Kathy Hochul. (n.d.).

<https://www.governor.ny.gov/news/governor-hochul-signs-legislation-advance-new-yorks-transition-clean-transportation>

Here's why people don't buy electric cars (and why they're wrong). (n.d.).

<https://cars.usnews.com/cars-trucks/advice/why-people-dont-buy-electric-cars>

Lesjak, Z. (2023, February 10). *Electric car sales and statistics for 2023*. Tridens.

<https://tridenstechnology.com/electric-car-sales-statistics/>

Marta.moses. (2023, February 27). *Benefits of electric cars on the environment*. EDF.

<https://www.edfenergy.com/for-home/energywise/electric-cars-and-environment>

New plug-in electric vehicle sales in the United States nearly doubled from 2020 to 2021.

Energy.gov. (n.d.).

<https://www.energy.gov/energysaver/articles/new-plug-electric-vehicle-sales-united-states-nearly-doubled-2020-2021#:~:text=Sales%20of%20new%20light%2Dduty,electric%20vehicle%20sales%20in%202021>

S&P Global Mobility forecasts 83.6m units in 2023 as light vehicle market cautiously recovers.

News Release Archive. (n.d.).

<https://press.spglobal.com/2022-12-20-S-P-Global-Mobility-forecasts-83-6M-units-in-20>