

A Study on Customer Perception Towards Electric Vehicles in Kamrup Metro

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Abstract

Electric vehicles (EVs) are a new type of automobile that is powered by electricity instead of gasoline, diesel, or other traditional fuels. The technology behind electric cars has been around for decades, but recent advances in battery technology and charging infrastructure have made them more practical for everyday use. Consumer perception plays a significant role in the adoption of new technologies, including electric vehicles. This study aims to investigate the consumer perception towards electric vehicles in Kamrup Metro, Assam. The global market for electric vehicles is rapidly growing due to increasing environmental concerns and government initiatives promoting the use of clean energy. As perceived by consumers, electric vehicles have numerous advantages such as environmental friendliness, lower fuel and maintenance costs, and improved driving experience.

Key words- Electric vehicle, consumer perception, innovation, technology.

Introduction

Electric vehicles (EVs) are a new type of automobile that is powered by electricity instead of gasoline, diesel, or other traditional fuels. The technology behind electric cars has been around for decades, but recent advances in battery technology and charging infrastructure have made them more practical for everyday use.

Electric vehicles are powered by electricity stored in batteries. The batteries are normally huge and flat, and they are positioned under the car's floor. A set of cables connects them to the motor. The motor is the component of the vehicle that drives the wheels. It is normally situated in the front and is linked to the wheels through a driveshaft. The component of the car that transfers power from the motor to the wheels is called the drivetrain. The driveshaft, differential, and axles are all part of it. The component of the car that maintains wheel contact with the ground is the suspension. It consists of the control arms, shocks, and springs. The portion of the car that houses the occupants and the cargo is called the body. It consists of the roof, doors, and windows.

Electric vehicles have been gaining increasing attention worldwide due to their potential to reduce greenhouse gas emissions, improve energy efficiency and address concerns related to climate change. In India, the government has launched various initiatives to promote electric Mobility, including the National Electric Mobility Mission Plan (NEMMP) in 2013 and the Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles (FAME) scheme in 2015. The state of Assam has also been taking steps to promote electric Mobility, with the launch of the Assam Electric Vehicle Policy in 2019. However, despite these efforts, the adoption of electric vehicles in Guwahati, the largest city in Assam, has been relatively slow Compared to other cities in India.

Consumer perception plays a significant role in the adoption of new technologies, including electric vehicles. Understanding the consumer perception towards electric vehicles in Guwahati is crucial for promoting the adoption of electric vehicles in the city. This study aims to investigate the consumer perception towards electric vehicles in Guwahati city, Assam.

Review of Literature

- Parmar and Pradhan (2021) Conducted a study in Vadodara City of India to understand the perception of consumers toward E-Vehicles as well as their awareness and driving factors. They conducted a survey among 100 consumers in the city. They study observed that people preferred mostly electric cars compared to bike and scooty. Environmental effect, price, noise level and new trend were observed to be important driving factors among people. overall, the study found that people mostly prefer conventional vehicles compared to E- Vehicle.
- Acharya (2019) Conducted a study on the role of electric vehicles in environmental sustainability to understand the perception towards electric vehicles. The main focus of the study is to understand how people will see electric vehicles in the future and to evaluate the performance of electric vehicles in comparison to other modes. He conducted a survey among 100 consumers. The study found that the high-income groups prefer more EV's than the low-income group.
- Tupe, Kishore and Johnvieira (2020) Conducted study on consumer perception of electric vehicles in India. Understanding consumer perception and the elements crucial to Electric vehicles purchases in India is the aim of this research. They study observed that by implementing electric transition, the government has taken the initiative to counteract the depletion of fossil fuels. But time it takes to recharging, the scarcity of charging stations, and the complexity of charging are cited by respondents as the main disadvantages of Electric vehicles today.
- Pandey, Mohan and Subha (2021) Conducted A study on consumer perception towards purchase intention of electric cars in India. They are mainly finding out what influences people's decision to buy electric automobiles. They conducted a survey among 102 consumers in all over the India. they study observed that Customers who are more inventive personally and who sense more financial rewards are more likely to buy electric cars.
- Ansar and Monika (2019) Conducted a study in Bangalore City on Consumer perception towards E-Vehicles as well as awareness and the elements that lead people to buy electric vehicles. they conducted a survey The respondents under survey were 67% male and 33% female. They study observed that people preferred mostly electric bikes and scooty compared to electric car.
- Adhikary, Jalan and Anute (2022) Conducted study on customers' perception about electric vehicles as well as awareness of electric vehicles in the Indian market and the things that prevent people from buying electric cars. They conducted a survey among 100 consumers. they study observed that consumers are much more looking for eco-friendly and sustainable products. Also, the government itself began making efforts to create suitable facilities and infrastructure that might normalize electric vehicles in the Indian market.
- Varghese, Abhilash, and Pillai (2021), Conducted a study on consumers perception and purchase intention of electric vehicles in India. The main focus of the research is Consumers' awareness of the EV and consumer acceptance of electric vehicles. They conducted a survey among 144 consumers in India. The researchers observed how the Government must play an important role in developing infrastructures for Electric vehicles in India.

Objective of the Study

1. To study the Awareness of Customers regarding electric vehicles;
2. To study its various factors that influence the customer decision making process for Choosing Electric Vehicles;

Methodology

- **Research type:** The present study is descriptive and empirical in nature. Descriptive research is a research design that is used to investigate different phenomenon and situations and

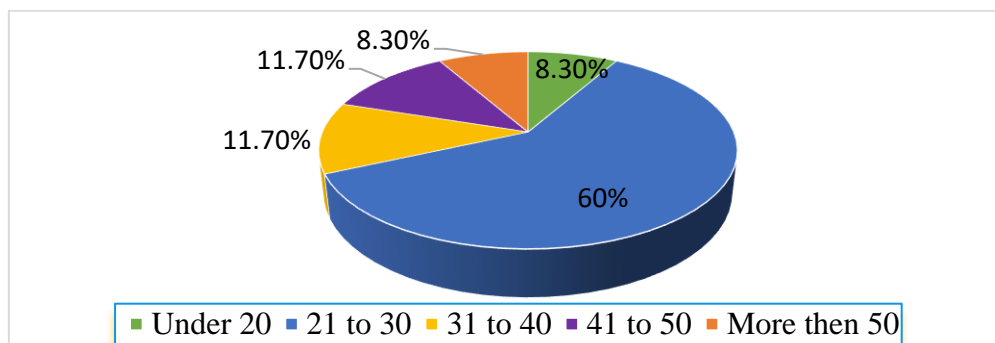
Empirical research is a systematic approach for answering certain types of questions. The study will be based on a field-based survey approach.

- **Source of data:** Primary data is a type of data that is collected by researchers directly from main sources through interviews, surveys, experiments, etc. The study has been conducted on the basis of primary data. The data was collected using a structured questionnaire and through a field survey among the residents of Guwahati city.
- **Sample size:** Sample is an unbiased number of observations taken from a population. The sample size for the study is 60.
- **Sampling technique:** The sampling technique is the method you employ while choosing a sample from a population. The study adopted a convenience sampling approach to collect the data.
- **Analysis:** The present study adopted descriptive analytical approach to interpret the results. For this purpose, pie charts, bar diagram and percentage analysis were used.

Data Analysis and Interpretation of Data

Data Analysis and interpretation is the process of reviewing data and arriving at relevant conclusions using various analytical methods.

Figure 1: Age Group

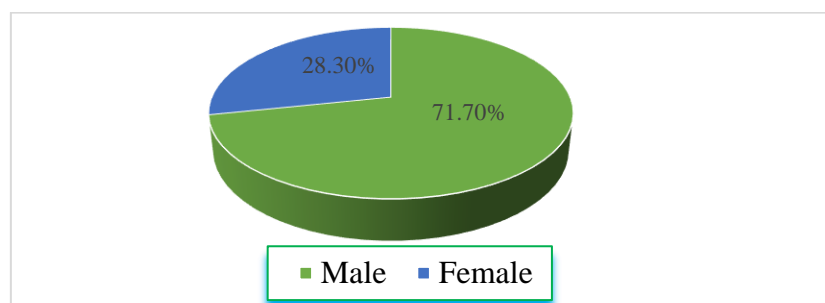


Source: Compiled from Primary data

Interpretation

From the above pie chart, it was found out that, out of 100% of the respondents most of the respondents are between the age of 21 to 30 years of age.

Figure.2: Gender



Source: Compiled from Primary data

Interpretation:

From the above pie chart, it was found out that, out of 100% of the respondents, majority of respondents are Male only 28.30% respondents are Female.

Table3: Occupation

Occupation	No. of Respondents	Percentage
Employed	12	20%
Business	07	11.7%
Student	30	50%
Professional	08	13.3%
Others	03	5%
Total	60	100%

Source: Compiled from Primary data

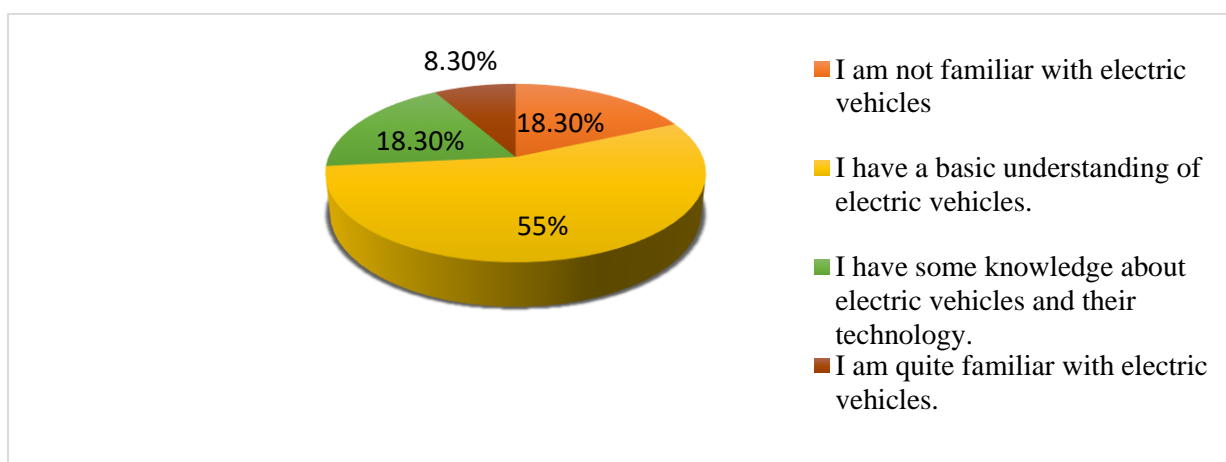
Interpretation:

From the above table, it was found out that, out of 100% of the respondents, 20% of respondents are Employed, 11.7% of respondents are Business, 50% of respondents are Students, 13.3% of respondents are Professional, and 5% of respondents are Others. This shows that the majority of the respondents are Students.

Table 4: How familiar are you with electric vehicles?

Statement	No. of Respondents	Percentage
I am not familiar with electric vehicles.	11	18.3%
I have a basic understanding of electric vehicles.	33	55%
I have some knowledge about electric vehicles and their technology.	11	18.3%
I am quite familiar with electric vehicles.	5	8.3%
Total	60	100%

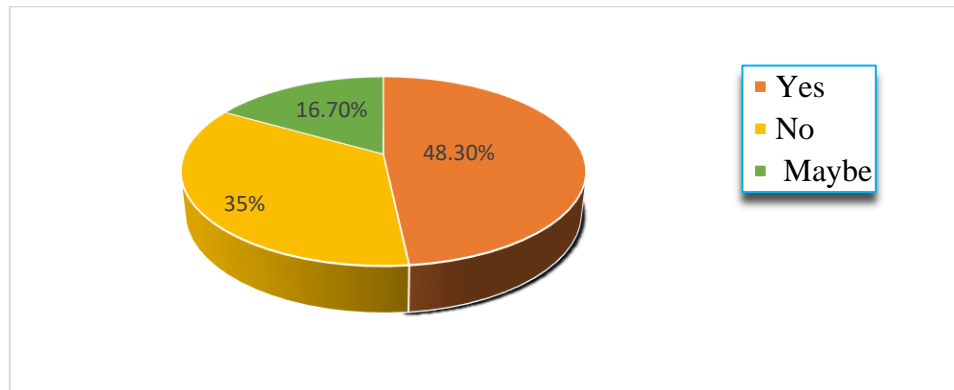
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Figure No:4.

Interpretation:

From the above Pie chart, it was found out that, out of 100% of the respondents, 18.3% respondents are not familiar with electric vehicles, 55% respondents have a basic understanding of electric vehicles, 18.3% respondents have some knowledge about electric vehicles and their technology, 8.3% respondents are quite familiar with electric vehicles. This shows that the majority of the respondents are have a basic understanding of electric vehicles.

Figure 5: Have you ever driven or ridden an electric vehicle?



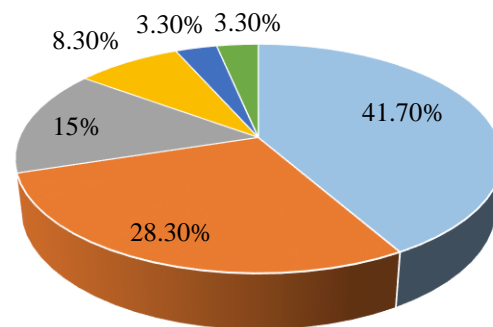
Source: Compiled from Primary data

Interpretation:

From the above Pie chart, it was found out that, out of 100% of the respondents, 48.3% respondents have driven or ridden in an electric vehicle, 35% respondents have not, and 16.7% respondents have possibly. This shows that majority of the respondents either driven or ridden an electric vehicle.

Figure No 6: What sources have you used to learn about electric vehicles?

- Internet search
- Social Media Platform (Facebook, Twitter, Instagram, etc..)
- Friends or Family members who own an Electric-vehicles.
- Television or print media
- Electric Vehicles manufacturers' website
- Others



Source: Compiled from Primary data

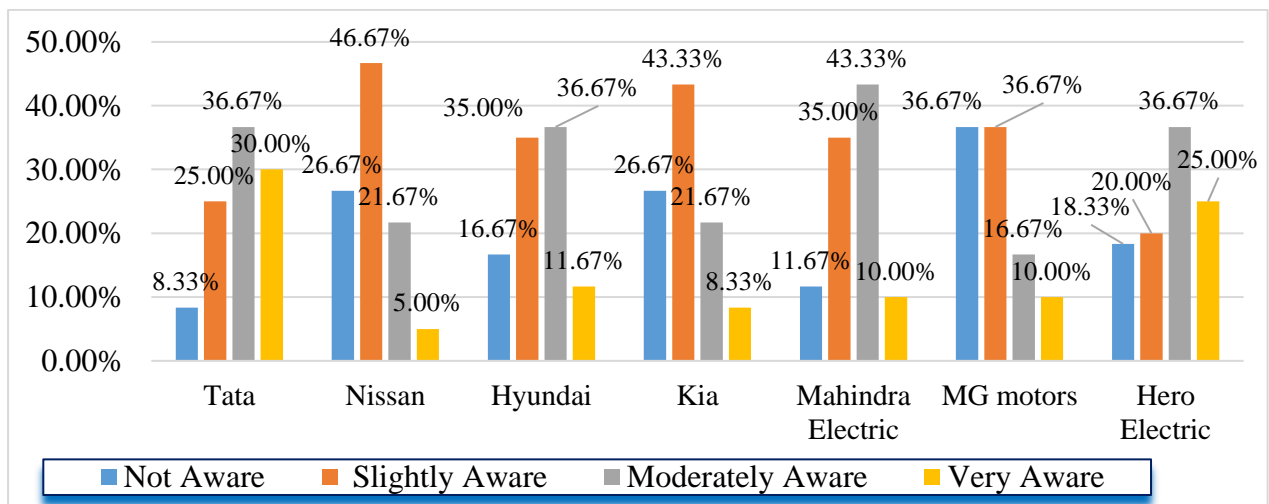
Interpretation:

From the above Pie chart, it was found out that, out of 100% of the respondents, 41.7% used Internet searches, 28.3% used social media platforms, 15% used friends or family who owned electric vehicles, 8.3% used television or print media, 3.3% used the websites of electric vehicle manufacturers, and 3.3% used other sources to learn about electric vehicles. This shows that majority of respondents learn about electric vehicles through Internet searches.

Table 7: How much awareness do you have regarding the electric vehicle brands mentioned below.

Electric Vehicles	Not Aware	Slightly Aware	Moderately Aware	Very Aware	Total
Tata	5	15	22	18	60
Percentage	8.33%	25.00%	36.67%	30.00%	100.00%
Nissan	16	28	13	3	60
Percentage	26.67%	46.67%	21.67%	5.00%	100.00%
Hyundai	10	21	22	7	60
Percentage	16.67%	35.00%	36.67%	11.67%	100.00%
Kia	16	26	13	5	60
Percentage	26.67%	43.33%	21.67%	8.33%	100.00%
Mahindra E.	7	21	26	6	60
Percentage	11.67%	35.00%	43.33%	10.00%	100.00%
MG motors	22	22	10	6	60
Percentage	36.67%	36.67%	16.67%	10.00%	100.00%
Hero Electric	11	12	22	15	60
Percentage	18.33%	20.00%	36.67%	25.00%	100.00%

Source: Compiled from Primary data

Figure No 7**Interpretation:**

From the above Column, it was found out of 100% Respondents that, 36.67% of Respondents are Moderately aware about TATA Electric vehicle. 46.67% of Respondents are Slightly aware about Nissan electric vehicles. 36.67% of Respondents are Moderately aware about Hyundai Electric vehicle. 43.33% Respondents are Slightly aware about Kia Electric vehicle. 43.33% of Respondents are Moderately aware about Mahindra Electric. 36.67% Respondents are Slightly Aware and also 36.67% Respondents are Not Aware about MG Motors. 36.67% of Respondents are Moderately aware about

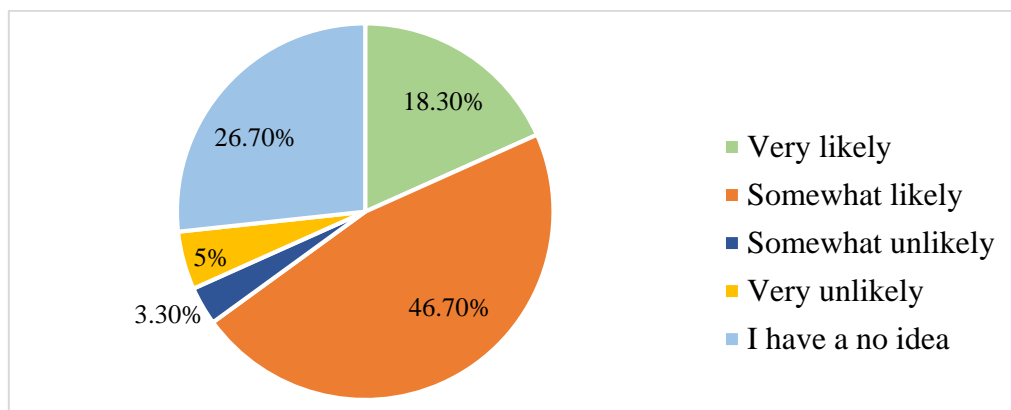
Hero Electric. This shows that the majority of the respondents are Very aware about Tata motors and hero electric

Table 8: How likely are you considering purchase an electric vehicle.

Statement	No. of Respondents	Percentage
Very likely	11	18.30%
Somewhat likely	28	46.70%
Somewhat unlikely	2	3.30%
Very unlikely	3	5%
I have a no idea	16	26.70%
Total	60	100%

Source: Compiled from Primary data

Figure. 8



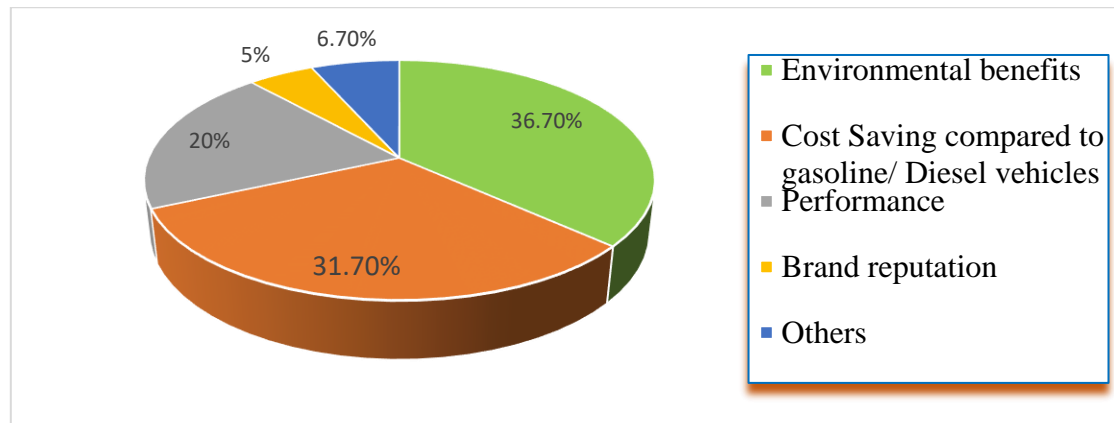
Interpretation

From the above Pie Chart, it was found out of 100% Respondents that, 18.30% Respondents are Very likely, 46.70% Respondents are Somewhat likely, 3.30% Respondents are Somewhat unlikely, 5% Respondents are Very unlikely, and 26.70% Respondents are I have no idea about considering purchase an Electric vehicle. This shows that the majority of the respondents are somewhat likely considering purchase electric vehicles.

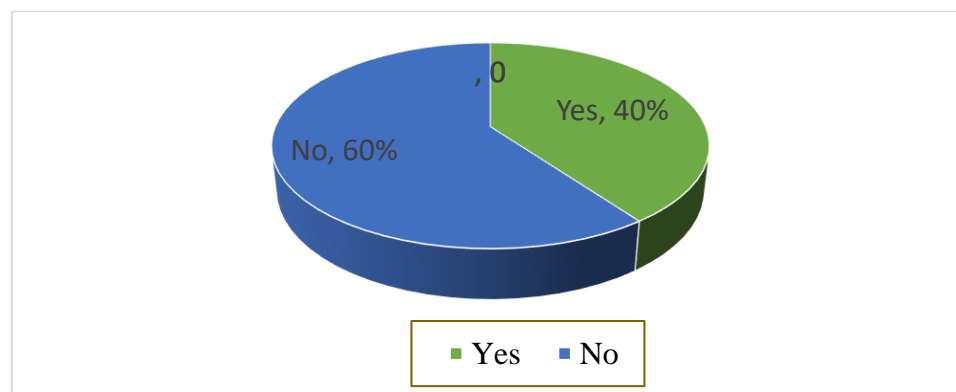
Table 9: What is the most important factor that would influence your decision to purchase an electric vehicle.

Statement	No. of Respondents	Percentage
Environmental benefits	22	36.7%
Cost Saving compared to gasoline/ Diesel vehicles	19	31.7%
Performance	12	20%
Brand reputation	3	5%
Others	4	6.7%
Total	60	100%

Source: Compiled from Primary data

Figure No. 9**Interpretation:**

According to the aforementioned pie chart, out of 100% respondents, 36.7% respondents cited environmental benefits as a factor in their decision to buy an electric vehicle, followed by 31% respondents who cited cost saving compared to gasoline/ Diesel vehicles, 20% respondent who cited performance, 5% respondents who cited brand reputation, and 6.7% respondents who cited other significant factors. This shows that the majority of the respondents cited environmental benefits as a factor in their decision to buy an electric vehicle.

Figure No.10 Have you ever tried test-driven an electric vehicle?

Source: Compiled from Primary data

Interpretation

According to the aforementioned pie chart, out of 100% respondents, 40% respondents have tried test-driving in an electric vehicle and 60% respondents have not. This shows that majority of the respondents not driven an electric vehicle.

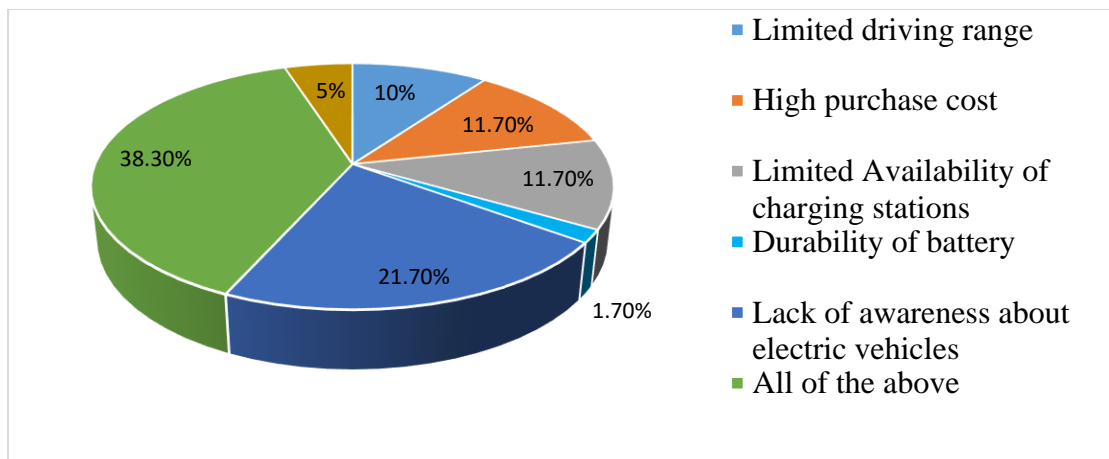
Table 11: Which of the following factors do you think are hindering the adoption of Electric Vehicles in Guwahati city?

Statement	No. of Respondents	Percentage
Limited driving range	6	10%
High purchase cost	7	11.7%
Limited Availability of charging stations	7	11.7%

Durability of battery	1	1.7%
Lack of awareness about electric vehicles	13	21.7%
All of the above	23	38.3%
None of the above	3	5%
Total	60	100%

Source: Compiled from Primary data

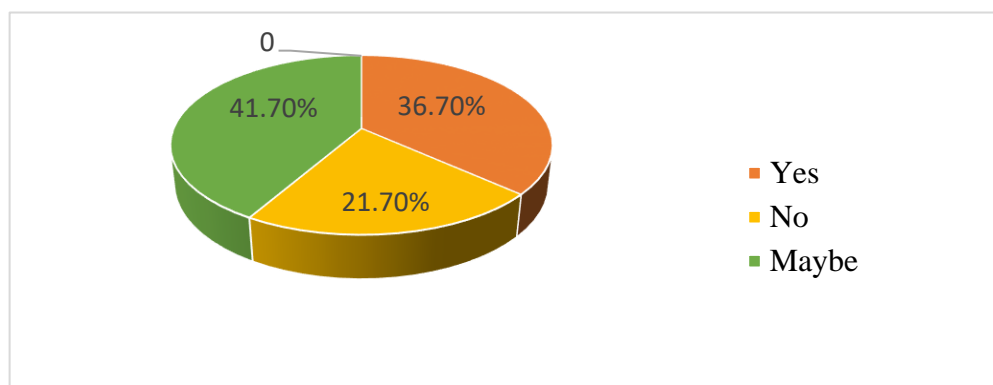
Figure No.11



Interpretation

According to the aforementioned pie chart, out of 100% of respondents, 10% reported having a limited driving range, 11.7% had a high purchase price, 11.7% had a limited availability of charging stations, 1.7% reported battery durability, and 21.7% reported not knowing much about electric vehicles. All of the aforementioned problems are cited as preventing the adoption of electric vehicles in Guwahati city by 38.3% of respondents, while none of the aforementioned factors are cited as preventing the adoption of electric vehicles in Guwahati city by 5% of respondents. This shows that majority of the respondents all of the listed aforementioned problems are cited as preventing the adoption of electric vehicles in Guwahati city.

Figure12: Are you willing to pay more for an electric vehicle compared to a gasoline/diesel vehicle.



Source:

Compiled from Primary data

Interpretation: From the above Pie chart, it was found out that, out of 100% of the respondents, 36.7% respondents willing to pay more for an electric vehicle compared to a gasoline/diesel

vehicle, 21.7% respondents willing not, and 41.7% respondents willing possibly. This shows that majority of the respondents possibly willing to pay more for an electric vehicle compared to a gasoline/diesel vehicle.

Table 13: What kind of charging infrastructure do you think is necessary for electric vehicles?

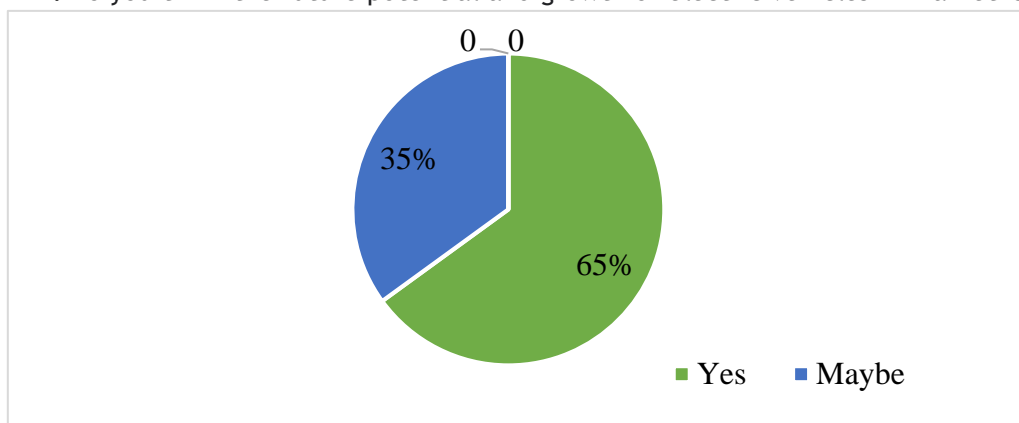
Statement	No. of Respondents	Percentage
Charging station at gas stations	11	18.3%
Charging station at public parking lots	4	6.7%
Home charging stations	3	5%
Wireless charging technology	9	15%
All of the above	33	55%
Total	60	100%

Source: Compiled from Primary data

Interpretation

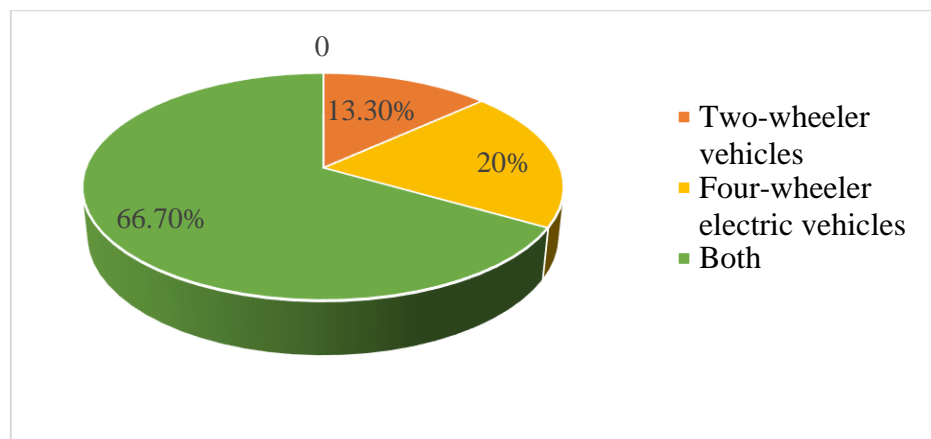
From the above table, it was found out that, out of 100% of the respondents, 18.3% respondents cited charging infrastructure is necessary for electric vehicles in Charging station at gas stations, followed by 6.7% respondents who cited charging station at public parking lots. 5% respondent who cited home charging stations, 15% respondents who cited Wireless charging technology, and 55% respondents who cited all listed charging infrastructure is necessary for electric vehicles. This shows that majority of the respondents, mention all listed charging infrastructure is necessary for electric vehicles.

Figure14: Do you think the future potential and growth of electric vehicles in market is high?



Interpretation

According to the aforementioned pie chart, out of 100% respondents, 65% believe that the future potential and growth of electric vehicles in the market is high, and 35% maybe. This demonstrates that a large majority of respondents concur that the future potential and growth of electric vehicles in the market is high.

Figure No15: Which electric vehicle do you prefer the most?

Interpretation

According to the aforementioned pie chart, out of 100% respondents, 13% respondents are preferring Two-wheeler electric vehicle, 20% respondents are Four-wheeler electric vehicle and 66.7% prefer Two-wheeler and Four-wheeler both electric vehicles. This shows that majority of the respondents prefer Two-wheeler and Four-wheeler both electric vehicles.

Findings

- In this study it is found that 71.7% of the respondents are male and 28.3% of the respondents are female. And most of them are of the age group between 21 to 30 years.
- Most of the respondents are Students and professional.
- Based on analysis we find that 55% individuals have a basic understanding of Electric vehicles.
- Out of 100% respondents, 48.3% respondents have driven or ridden in an electric vehicle.
- Most of the respondents learn about electric vehicles through Internet searches.
- Out of 100% respondents the majority of the respondents are Very aware about Tata motors and Hero electric, also majority respondents are not aware about MG motors, Nissan and kia.
- Out of 100% respondents, majority of respondents will consider buying an electric vehicle, 26.7% respondents may buy and remaining only 8.3% respondents will not consider buying an electric vehicle.
- Based on analysis we find that most of respondents are environmental conscious, 31.7% respondents decide to purchase an electric vehicle for cost saving compared to gasoline/diesel vehicle.
- Out of the 100% of respondents, 60% had driven an electric vehicle and most of them had positive feedback.
- Based on analysis we find that most of respondents think Limited driving range, high purchase cost, limited availability of charging stations, durability of battery, lack of awareness about electric vehicle, all factors are hindering the adoption of electric vehicle in Guwahati city.
- Based on analysis we find that out of 100% respondent, most of the respondents willing to pay more for an electric vehicle compared to a gasoline/ diesel vehicle.
- Out of 100% respondents the majority of the respondents think charging station at gas stations and wireless charging technology is necessary for electric vehicle.
- The future potential and growth of electric vehicle in the market is very high. Because including government policies and regulations, advancements in battery technology, consumer demand for eco-friendly vehicles, and the increasing cost-effectiveness of electric vehicles over traditional gasoline vehicle.

- Most of the respondents prefer two-wheeler and four-wheeler both of electric vehicle.

Social Implications

The social and environmental impacts of electric vehicles There is a huge impact on society as well on environment by electric vehicles. The electric vehicle will have impact on mobility and travel, it will also have an impact on consumption of petroleum as well as other fuel, as on environmental impact, it will definitely help to reduce air pollution and also traffic noise to a great extent.

Suggestions

- ❖ There should be more awareness camp about electric vehicle. Customers are less aware of electric vehicle models, also there are very few models available in Guwahati city, so more brand can come up with adding more EV models.
- ❖ Only a few models are involved in producing electric vehicle models with limited brands.
- ❖ The price of electric vehicle is a big concern for the customer thus the brand should try to provide electric vehicles model cars at an affordable rate at the market.
- ❖ Another big issue with electric vehicle is of charging stations, which are located in very few locations in Guwahati city. More charging stations need to be established so that it can be beneficial for long drive.

Conclusion

The global market for electric vehicles is rapidly growing due to increasing environmental concerns and government initiatives promoting the use of clean energy. As perceived by consumers, electric vehicles have numerous advantages such as environmental friendliness, lower fuel and maintenance costs, and improved driving experience. However, there are also concerns such as range anxiety, high initial cost, and lack of charging infrastructure, which affect consumer purchasing decisions. Automotive industry players and policymakers need to focus on addressing consumers' concerns and providing incentives to encourage the adoption of electric vehicles. With time, it is expected that consumer attitudes, government policies, and advancements in technology will lead to a significant shift towards electric vehicle adoption worldwide.

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