CONSUMER PREFERENCES TOWARDS ELECTRIC TWO-WHEELERS WITHIN COCHIN CORPORATION

Dissertation submitted to

St. Teresa's College (Autonomous)

(Affiliated to Mahatma Gandhi University, Kottayam)

In partial fulfilment of the requirement for the degree of

MASTER OF ARTS IN ECONOMICS

By

BAGHYA SUGATHAN

Register No. AM22ECO004

Under the Guidance of

Dr. PEARLY ANTONY O.

ASSISTANT PROFESSOR

DEPARTMENT OF ECONOMICS

ST. TERESA'S COLLEGE

ERNAKULAM

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Certificate

This is to certify that the project titled "**CONSUMER PREFERENCE TOWARDS TWO WHEELER ELECTRIC VEHICLES WITHIN COCHIN CORPORATION**" is a project done by **BAGHYA SUGATHAN (Register No. AM22ECO004**) under my guidance and supervision in partial fulfillment of the requirements for the award of the degree in Master of Arts in Economics (Affiliated to Mahatma Gandhi University, Kottayam**)**. The research work has not previously formed the basis for any Degree, Diploma, Associate ship, Fellowship or any other similar title and it represents a contributory work on the part of the candidate.

Dr. Anupa Jacob **Dr. Pearly Antony O.**

Head of the Department **Guide and supervisor**

DECLARATION

I hereby declare that the project titled "**CONSUMER PREFERENCES TOWARDS TWO – WHEELER ELECTRIC VEHICLES WITHIN COCHIN CORPORATION**" submitted by me for the M. A Degree in Economics is my original work and this work has not been previously formed the basis for the award of other Academic qualification, fellowship of other similar title of any other university or board.

Signature of the Supervisor **Signature of the Candidate**

Dr . Pearly Antony O . Baghya Sugathan

ACKNOWLEDGEMENT

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I am always thankful to my parents, siblings and friends whose efforts, encouragement and helping hands showered me the best blessings for the successful completion of my project.

And finally, I am deeply thankful to the God, for letting me pass through all the difficulties.

Baghya Sugathan

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CHAPTER -1

INTRODUCTION

1.1 INTRODUCTION

In India, the possibilities for electric two-wheeler seem promising as the nation shifts to a more environmentally friendly and sustainable future. The introduction of innovative two-wheeler electric vehicle has been one of the most significant developments in the Indian electric two-wheeler industry during the previous five years.

Two-wheeler have long been the preferred mode of transportation in India for different reasons, including their overall affordability, ease of getting in highly congested regions, and ease of locating parking spaces. Now, as electrification expands across this industry, the two-wheeler market is vividly changing.

Two-wheeler electric vehicle industry will continuously grow due to the increase in rising cost of fuel, consumers who are becoming more conscious and preferring environmentally friendly transportation, and the ongoing rise of environmental issues.

Electric vehicles (EVs) have gained widespread acceptance in India due to the government's program, namely Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME), which first came into effect on April 2015. This program has significantly contributed to the growth of electric two-wheeler in the past few years, along with a number of other government initiatives like tax cuts and subsidies.

TVS Motor, an established two-wheeler manufacturer in India, introduced the iQube electric scooter. With its 4.4 kW electric motor, top speed of 78km/hour and 100 km range on a single charge, the iQube brought in a new era of reliable features and technology for electric two-wheelers.

The future of two-wheeler electric vehicle in India has been significantly shaped in recent years by the government's support for electric vehicle, growing public awareness of global warming, and the growing demand for environmental friendly transport solutions. In India, we are going through an innovative new phase of electric two-wheelers.

1.2 REVIEW OF LITERATURE

David Layzell and **Sara Hastings-Simon** (**2016**), examined how government incentives influence consumer attitudes toward electric vehicles (EVs) in Canada, their study revealed

that financial incentives, such as tax credits and rebates, are vital in persuading consumers to select electric vehicles (EVs).

Liao (**2017**) provides valuable insights on how government policies affect India's adoption of electric vehicles. This study also emphasizes the use of expressed preference methods to investigate the range of preferences among consumers who are thinking about buying electric automobiles.

Bhat, Subhash , S. A. (2013) point out the Impact of Government Policies on the Adoption of Electric Vehicles in India. The authors examine the ways in which financial programs, rules, and incentives from the Indian government promote the use of electric vehicles.

Benjamin K. Sovacool, Sabine Hielscher, Johannes Kester (2015) examined how social influence affects customer preferences for electric vehicles.

From **Shukla Nitish Sharma, Satyendra Pratap Singh, Ashish Chandrakant, and Surendra Pratap Singh** (2021) point of view, air pollution affects the surroundings and health on a daily basis and is more than just a number. Their lungs are straining to take in the poisonous air as they observe their cities choking on pollution. They understand that the transportation and industrial sectors are mostly to fault for the millions of lives lost each year. Electric vehicles stand out as a better, more environmentally friendly option in this situation. However, they lie in the way of India's mainstream adoption of EVs. They look forward to laws and programs that will create a sustainable future in which access to clean air is no longer a barrier.

An overview of electric vehicles and their charging infrastructure in India was published in **2007** by **Jayashree S**. and **B.G. Fernandez**. Their study looks at the current state of EVs in India, covering **topics** like adoption rates, market size and the laws that govern it.

In a study on the factors influencing consumer choices for electric vehicles (EVs), **Priyabrata Mandal**, **V. Ravi Kumar**, and **Abhijeet Chandra** covered the influences of society, financial incentives, technological improvements, and environmental considerations.

According to the data from the government's Vahan portal, sales of electric two-wheeler manufacturers reached 81,608 units in January 2024 , increasing 8% month over month and 26% from the previous year .

Mahendra Nath Pandey, the Minister of heavy industries, has announced that Rs 500 crore will be set aside for the Electric Mobility Promotion Scheme (EMPS), 2024. This program will run for four months starting on April 1.

Lingzhi Jin (2017) claims that although there are still early stages of the market expansion for electric vehicles, a number of barriers are preventing them from being widely adopted. The new technology, increased cost, relative discomfort in relation to range and recharge times, and consumer ignorance of the technology and availability are some of these challenges.

1.3 STATEMENT OF THE PROBLEM

This study's primary objective is to determine the different elements that affect people's decisions to use two-wheeler electric vehicles (EVs). Governments can create policies that work by knowing these factors, and automakers can better fulfill the demands and preferences of customers. To accomplish this goal, though, a comprehensive market analysis is a challenge we must overcome.

In addition, trying to gauge consumer preferences with two-wheeler EVs can help in tailoring cars to suit individual tastes and spur innovation by embracing cutting-edge technologies.

1.4 OBJECTIVES OF THE STUDY

The study intends,

- To identify the factors affecting consumers to purchase two-wheeler E-vehicles.
- To analyze whether the consumer preference has changed from the fuelled vehicles to two-wheeler electric vehicles.
- To find out the extent of consumers awareness regarding various government schemes for the promotion of e-vehicles.

1.5 THEORETICAL FRAMEWORK

1. Consumer behaviour provide valuable insights to understand the choices consumer make regarding whether or not to purchase a product, as well as the factors that affect the choices.

2. Consumer preference theory is also used as a theoretical framework. Consumer preferences with variables are a theoretical framework that examines the elements influencing customers'

purchasing decisions and decision-making processes. Cost value, performance, expectation, societal influence, and other determinants are a few examples of these variables. In order to assess and comprehend consumer interests and support their marketing methods and objectives, marketers must have a thorough understanding of these elements.

1.6 RESEARCH METHODOLOGY

The study was conducted using primary and secondary data. Primary data includes personal interview and questionnaire method. Secondary data was collected using journal, research papers, websites and publications. The sampling technique used for the study is purposive sampling .For the study , 70 respondents were selected who were the two-wheeler vehicle users .To understand the data, percentage analysis has been used. Also diagrammatic representations such as Pie diagrams, column diagrams are also used .

1.7 SCHEMES OF THE STUDY

Chapter 1: Introduction

The first chapter deals with the introduction, review of literature, objectives of the study, statement of the problem, theoretical framework, methodology of research, limitations of the study , concepts and definition .

Chapter 2: Overview

In the second chapter, an overview about the topic is discussed. An outlay of two-wheeler electric vehicle is discussed.

Chapter 3: Data interpretation

In the third chapter, the interpretation of the data collected through the survey is discussed. The analysis of the respondents of the questionnaire that satisfies the objective is given in this chapter.

Chapter 4: Findings and recommendations

In the fourth chapter, major findings, recommendations and conclusion of the study is included.

1.8 LIMITATIONS OF THE STUDY

- Respondents were reluctant to give information.
- The primary data collected may be biased.

1.9 CONCEPTS AND DEFINITION

A consumer is a person or organization that purchases goods or services for their own use; they are frequently not involved in business ventures. A number of criteria, including price, quality, accessibility, brand, advertising, and social and cultural aspects, have an impact on their purchasing decisions.

Consumer preference is a concept that refers to the choices consumers make to maximize their satisfaction.

Consumer preference is a key factor in the economy .It is one of the most important factors influencing demand, supply, and price.

An electric vehicle (EV) is a mode of transport which is powered by electricity. Unlike conventional vehicles that use a gasoline (petrol) or diesel-powered engine, electric cars and trucks use an electric motor powered by electricity from batteries or a fuel cell.

A vehicle with two wheels is called a two-wheeler. The two wheels might be positioned side by side on the same axle or in tandem, one behind the other, as with single – track vehicles.

CHAPTER -2

TWO-WHEELER ELECTRIC VEHICLES; AN OVERVIEW

2.1 INTRODUCTION

India, a country with more than a billion citizens, is on the edge of a revolution in environmental protection. It is more important than ever to switch to sustainable transportation options due to the startling increases in air pollution, greenhouse gas emissions, and the usage of fossil fuels. Electric vehicles with two wheels (EVs) have become a ray of hope for India's efforts to achieve net zero emissions.

Electric scooters and electric motorbikes are examples of two-wheeler EVs, a class of electric vehicles intended for personal mobility. These vehicles run mostly on electricity stored in rechargeable batteries which replaces the requirement for conventional gasoline or diesel fuel. Their electric motors provide the necessary power .Two-wheeler electric vehicles (EVs) are a cleaner option than gasoline-powered vehicles because they emit no pollutants when in operation .

Two-wheeler EVs not only offer a lower emissions option, but they also tend to be less expensive to run and maintain than conventional gasoline-powered cars. Because two-wheeler EVs have fewer moving parts and a simpler design, they require less maintenance over time. In the EV business, India has achieved significant success; however, Indian customers' tastes and needs are changing quickly with regard to EVs.

With the growing popularity of electric two-wheelers, consumers are looking for more fashionable, cost-effective, and environmentally friendly methods to satisfy their transportation needs. But the availability and presence of charging infrastructure is critical to EV adoption in India.

2.2 HISTORY OF ELECTRIC VEHICLE

Electric vehicles (EVs) are defined as vehicles that are propelled by one or more traction motors or electric motors. Electric vehicles can be self-sufficient, powered by electricity obtained from sources outside the car through a collector system, or they can be self-sufficient and equipped with fuel cells, batteries, solar panels, or electric generators to turn gasoline into energy. Examples of electric vehicles include electric airplanes, electric spaceships, electric railroad and road vehicles and surface and underwater watercraft.

Midway through the 1800s, when electric was a popular method of powering automobiles, electric vehicles (EVs) first came into being. While electric power remained common in other vehicle types, such as railroads, internal combustion engines remained the main source of propulsion for cars and trucks for almost a century.

2.3 TWO-WHEELER ELECTRIC VEHICLE MARKET IN INDIA

India's two-wheeler electric vehicle (EV) market is rapidly evolving due to a number of reasons, such as governmental policies, advances in technology, and shifting consumer tastes. The ease of electric scooters and motorbikes, as well as growing gasoline prices and environmental awareness, are all factors contributing to the growth.

The leading players in the industry have doubled down on the two-wheeler EV market as a result of the industry's quick penetration. They have expanded their product lines to target a variety of custom categories, offering new vehicles that range from high-performance bikes to inexpensive scooters.

It is anticipated that the two-wheeler EV industry in India would continue to grow. The market for two-wheeler electric vehicles (EVs) in India is expected to expand at a compound annual growth rate (CAGR) of 44% from 2020 to 2025, reaching USD 75 million. Two-wheeler EVs are predicted to account for 60–70% of new car sales in the nation by 2030.

India's growing two-wheeler EV market is a step in the right direction for environmentally friendly mobility. Even while there are still obstacles to overcome, government, business, and consumer actions together are opening the door to a future that is greener, cleaner, and more prosperous economically. This shift involves embracing a new way of living and way of thinking in addition to using new technologies, which could have significant effects on the area and beyond.

2.3.1 FUTURE OF TWO-WHEELER VEHICLES IN INDIA

In India, two-wheelers are widely acknowledged as a great choice for everyday transportation in both urban and rural regions. The adoption of sustainable and environmentally friendly procedures has led to a notable surge in the electric two-wheeler business in India in recent times. The Indian government's objective of lowering greenhouse gas emissions and guaranteeing a sustainable, low-carbon future is expected to propel the growth of the electric two-wheeler sector even further.

The NITI Aayog and RMI study on India's Electric Mobility Transformation validates this, stating that electric two-wheeler sales penetration in India could reach 80% by 2030 if Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles (FAME) Phase II and other measures are successful.

The two-wheeler industry in all of India will grow quickly thanks to tried-and-true technologies and applications. The industry is changing to satisfy consumer needs, as evidenced by the introduction of CAN-based chargers, the creation of high mileage low consumption automobiles, and the application of AIS 156 rules. Electric two-wheelers are predicted to grow in popularity as a form of transportation in India with continuing innovation and research, helping to create a more sustainable and clean future .

2.4 MAIN REASONS FOR THE GROWTH OF TWO-WHEELER ELECTRIC VEHICLE

Electric two-wheelers are a more economical option than traditional fuel scooters and motorbikes because they are more affordable and suitable for short -to medium distance travel. The FAME II scheme, which offers incentives and subsidies for electric two-wheelers, is one example of how the Indian government has demonstrated its support for electric mobility. Economic benefits, such as lower customs duties and recycling expenditures, have made the climate more conducive to the expansion of electric two-wheelers. In November 2023, sales of electric two-wheelers were 91,243 vehicles.

The main reasons for the growth of two- wheeler electric vehicles are:-

In India, two-wheelers have traditionally been the lifeblood of transportation. Their cost-effectiveness and adaptability for short to moderate-distance travel perfectly match the requirements of urban and semi-urban regions. Particularly, the two-wheeler electric vehicle is becoming more and more popular as an affordable substitute for conventional motorbikes and scooters, opening up sustainable transportation to a wider range of people.

- Recognizing the critical role that electric mobility plays, the Indian government has set out to transform the country’s transformation on a large scale. Transportation system. Schemes such as the FAME II initiative, which is expected to be extended for an additional year in 2024, provide subsidies and incentives with an emphasis on electric two-wheelers. These initiatives play a crucial role in enabling a sizable

portion of the people to favor electric powered motors, so advancing sustainability on a large scale.

- Two key developments that have made electric two wheelers more realistic and easier for average users are the advancement of battery swapping technology and the expansion of charging infrastructure. The community of charging stations in metropolitan areas is quickly growing because to government and private investments, mostly from Original Equipment Manufacturers (OEMs). Customers' trust is being increased by this developing infrastructure, which also allays worries regarding range tension and charging accessibility.
- Buildings and population density in India's cities are increasing, worsening traffic and pollution. Our transportation needs to be environmentally friendly if we are to solve these issues. Because they cut down on pollution and traffic in crowded cities, electric bikes and scooters are an excellent option.
- Environmental concerns have led to a rise in the use of electric bikes and scooters among Indians. Their aim is to contribute to the mitigation of pollution and save the Earth. The increasing consciousness of the need to protect the environment is driving a shift in India's car market toward electric vehicles.
- To reduce problems such as global warming, air pollution, environmental issues moving towards electric two-wheeler will be a suitable solution for this problem. Rise of environmental consciousness is the reason for this changing decision.

2.5 MAJOR PLAYERS IN TWO-WHEELER ELECTRIC VEHICLE MARKET IN INDIA

A growing emphasis on sustainability, energy efficiency, and environmental consciousness is driving a fundamental revolution in the Indian automobile industry. In light of this changing environment, the market for electric two-wheelers, or e-vehicles, has emerged as a promising area with room for expansion and innovation. In a market featuring nearly 180 players, five Original Equipment Manufacturers (OEMs) dominate the market.

They are as follows: -

1) Ola Electric

Ola Electric leads the pack, maintaining its dominance in FY2024. With a record-breaking monthly retail of 32,160 units in January .Ola's cumulative sales for the first 10 months reached 247,607 units, averaging an impressive 24,760 units per month. Ola achieved a significant milestone on December 8, 2023, by commencing deliveries of its all-new S1 X+, featuring a 3kWh battery and a certified range of 151km.

2) TVS motor

TVS Motor Co follows closely, leveraging the success of its iQube e-scooter. In January 2024, the company retailed 15,181 units, capturing a 19% market share and bringing its cumulative 10-month total to 141,640 units. TVS is making a calculated strategic move into foreign markets by attempting to extend its electric vehicle sales program to Nepal and Europe .

3) Ather Energy

Ather Energy is an Indian electric two-wheeler, based in Bengaluru. With 9,209 units sold in January 2024, Ather Energy is the third largest e-two-wheeler OEM in India—acquired an 11.32% market share. It is a firm that designs, produce, and sells high-performance electric scooter.

4) Bajaj Auto

Bajaj-Auto is a Pune based Multinational automobile industry company which joined the EV market in January 2020, kept units good performance in January 2024, selling 10,742 Chetak units .Ramped up production and an expanded Bajaj Chetak network, currently in 141 cities across India, is to be expanded to 250 cities by March 2024 .

2.6 COMPARISON OF EV SCOOTER AND PETROL SCOOTER

Scooters have always been a popular mode of transportation, offering convenience and ease of use. Scooters and bikes are the most common mode of transportation used in the city, as it is the very easy to move around with the innovation of electric scooters coming into the market, consumers are ready to consider going green.

- An electric or e-scooter is a two-wheeler vehicle that uses electricity as fuel. A green and affordable alternative to e-scooters are designed for short-distance travel. They are propelled by rechargeable batteries, eradicating the need for carbon-emitting fuel. Electric scooters are lightweight, compact, noise and pollution-free.
- A petrol scooter is a two-wheeler vehicle that uses petrol as a fuel. A common mode of commutation for decades, petrol scooters are efficient in covering short to long distances. They are equipped with a petrol-powered engine and thus emit harmful pollutants contributing to global warming.
- The main distinction between electric and petrol scooters is the source on which they run. E-scooters run on electricity stored in rechargeable batteries. On the other hand, petrol scooters depend on the combustion of petrol.
- Running cost of electric scooter are more efficient than petrol scooter. This is because charging the batteries of e-scooters is more affordable than refueling with highly priced petrol.
- When it comes to range and speed, petrol scooters are better than their electric counterparts. The larger fuel tanks and longer ranges make them reliable for long-distance journeys' E-scooters have a short operational range due to the battery capacity and limited top speeds. Hence, they are suitable for short travels around the city.
- E-scooters are powered by electricity and do not produce any harmful emissions. Hence, they contribute to a cleaner environment.
- In contrast, petrol scooters depend on the combustion of fossil fuels. They emit pollutants like nitrogen oxides, carbon monoxide, etc., contributing to global warming.
- Have to wait for a few hours to charge e-scooter; a petrol scooter can be refueled within a few minutes at the petrol station. The electric segment is in the initial stages, and therefore, charging stations are limited in number. This makes e-scooters unsuitable for long-distance travel, especially on highways.

2.7 GOVERNMENT INCENTIVES FOR ELECTRIC VEHICLES

Government provides various financial incentives for promoting electric vehicles. The main aim of government is to provide incentive for the potential consumers to purchase electric vehicle.

They are:-

2.7.1 State level EV policies

1) Purchase Incentive Programs where the consumer receives a direct saving on the price of electric vehicle.

2)A financial reward with a later reimbursement is provided .

3)There is no road tax at the time of purchasing electric vehicle .

4) The one-time registration fee applied when buying a electric vehicle is eliminated .

5) There is also several advantages such as interest-free loans , top-up subsidies , exclusive offers on electric vehicles .

2.7.2 National level incentives

The primary initiative in India to promote electric transportation is called FAME, or Faster Adoption and Manufacturing of (Hybrid and) Electric Vehicles. FAME-II, which is presently in its second phase of implementation, has a budget allocation of 10,000 Cr and will be in effect for three years starting on April 1, 2019 .

1) For two-wheeler : - Rs . 15,000/- per kWh upto 40% of the cost of vehicle is provided . And its approximate size of the battery should be 2 kWh .

2) Its different in the case of three wheeler , it's total approximate incentive provided is 10,000 /- per kWh and the approximate size of the battery is 5 kWh .

3)In four-wheelers , E Buses , E Trucks their total approximate incentives are 10,000 /- , 20,000/- , 20,000/- per kWh . The battery size of the respective vehicles should be 5,15,250 kWh .

CHAPTER -3

DATA ANALYSIS AND INTERPRETATION

3.1 INTRODUCTION

The automobile industry has witnessed an enormous shift in recent years toward more environmentally forms of transportation, with electric scooters emerging as a substitute for traditional two-wheeler scooters. The purpose of this study is to examine the different aspects that consumers take into consideration when deciding whether to purchase two-wheeler electric vehicles.

This chapter consists of the analysis and interpretation of the primary data collected. The awareness level of consumers on two wheeler electric vehicle, factors affecting to purchase EV, influence of government incentives on purchasing electric vehicle, features they consider while purchasing EV, concerns regarding charging infrastructure , reliability of the technology , consumers interest to participate in educational programmed of electric vehicle are discussed. This questionnaire is prepared based on the factors affecting consumers to purchase two-wheeler electric vehicle.

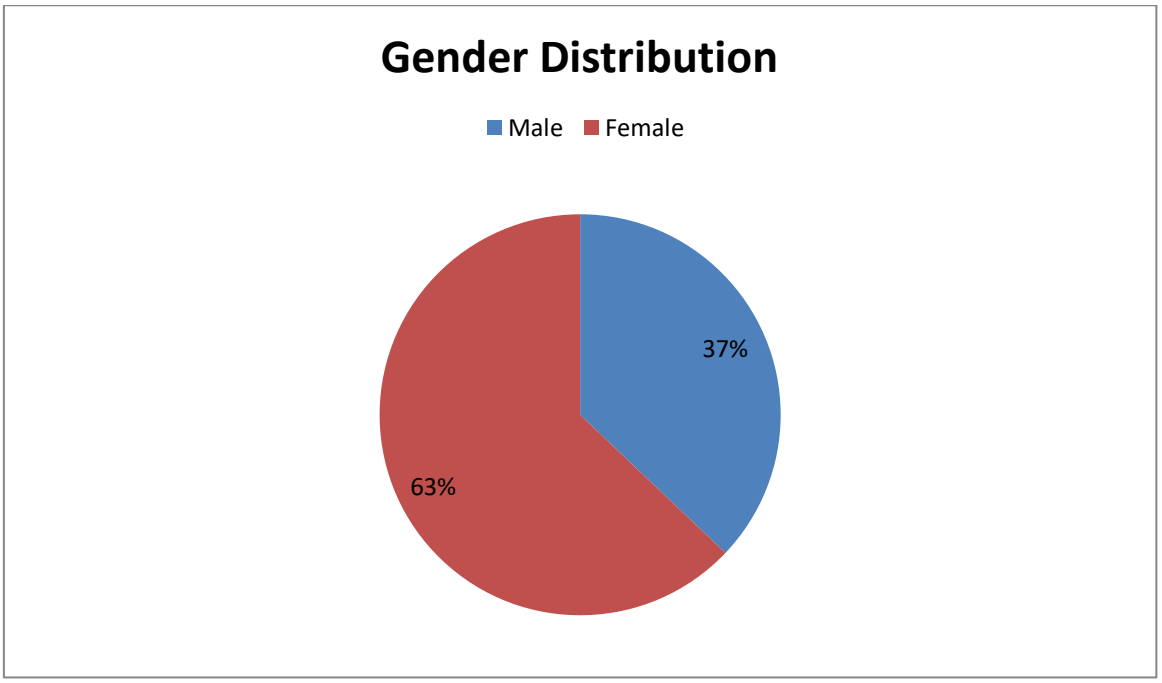
3.2GENDER-WISE DISTRIBUTION

Table 3.2 Gender –wise distribution

Gender	Number of Respondents	Percentage of Respondents
Male	26	37.1%
Female	44	62.9%

Source: Primary Data

Figure 3.2 Gender -wise distribution



Source: Primary Data

From the data collected, it can be observed that majority of the respondents are female above table shows the gender wise distribution of the respondents. Who constitute 62.9% of the total respondents and the remaining 37.1%.

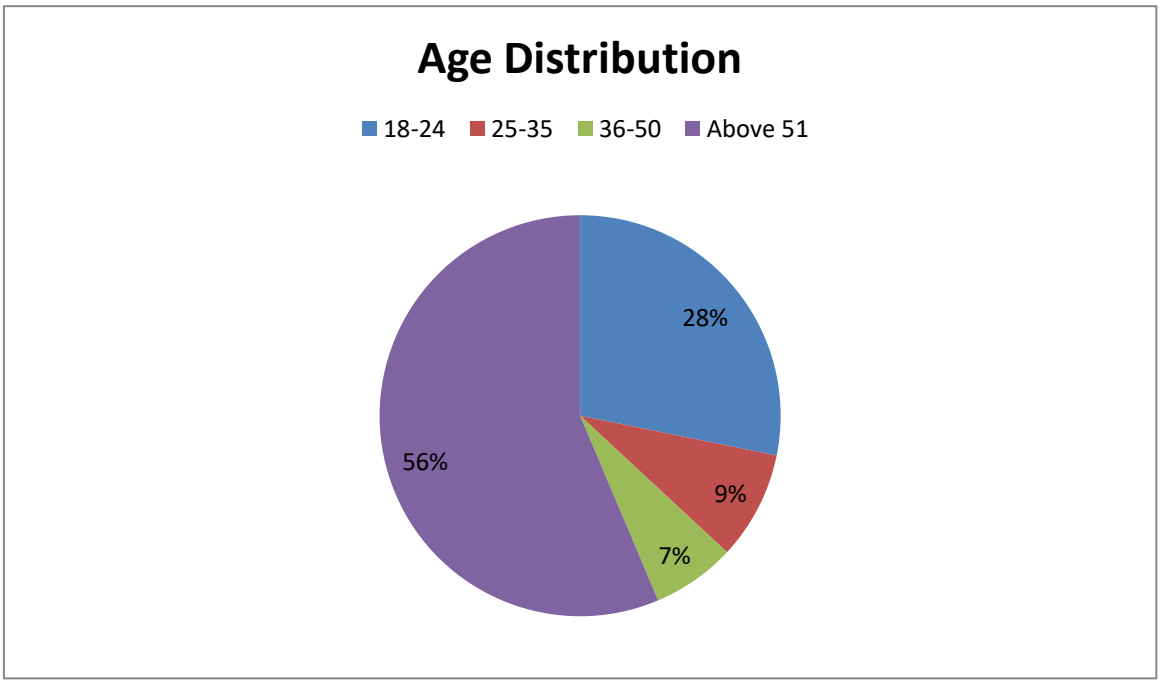
3.3 AGE-WISE DISTRIBUTION

Table 3.3 Age-wise distribution

Age	Number of Respondents	Percentage of Respondents
18-24	42	60%
25-35	13	18.6%
36-50	10	14.3%
Above 51	5	7.1%

Source: Primary Data

Figure 3.3 Age-wise Distribution



Source : Primary Data

The Age- distribution data shows that majority of the respondents comes under the age category 18-24. They accounted for 60% of the total respondents. Its is shown that 18.6% of the respondents are in the age between 25-35 . In the age category 36-50, it constitute 14.3% of the respondents and the least respondents of 5 accounted for 7.1% of the total respondents .

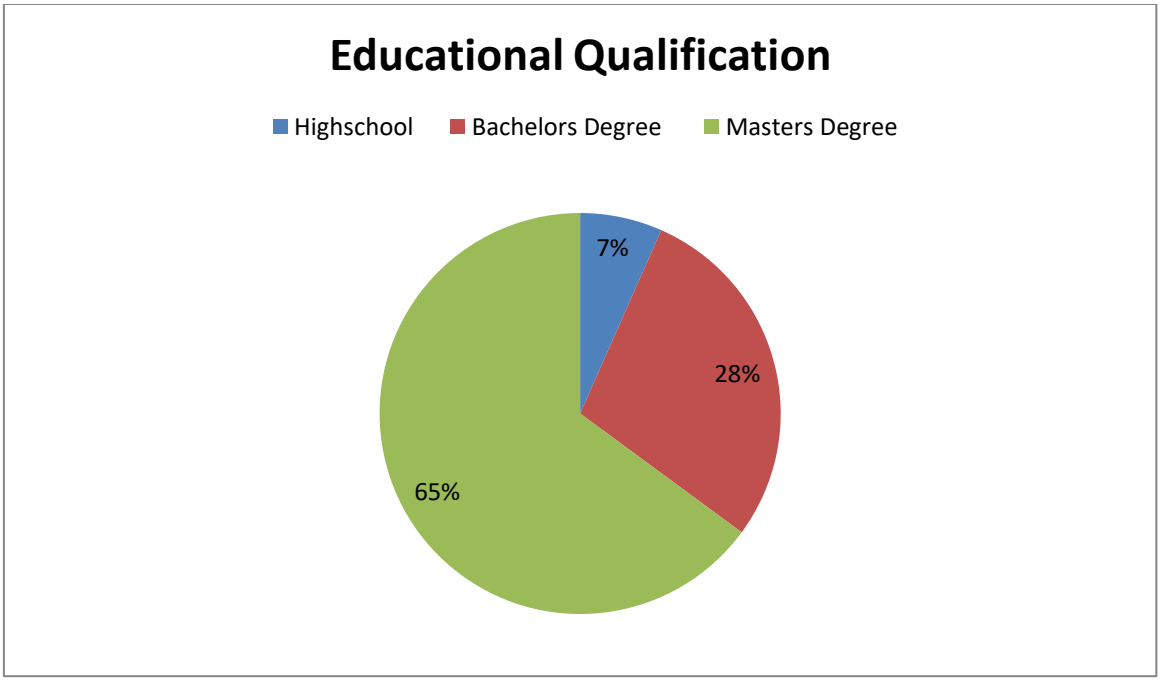
3.4 EDUCATIONAL QUALIFICATION

Table 3.4 Educational Qualification

Educational Qualification	Number of Respondents	Percentage of Respondents
High school	10	14.3%
Bachelor's degree	43	61.4%
Master's degree	17	24.3%

Source: Primary Data

Figure 3.4 Educational Qualification



Source: Primary Data

The data shows, majority of the respondents are bachelors degree holder accounted 61.4% of the total respondents. Around 24.3% of respondents qualification is Masters degree and 14.3% of respondents comes under high school category.

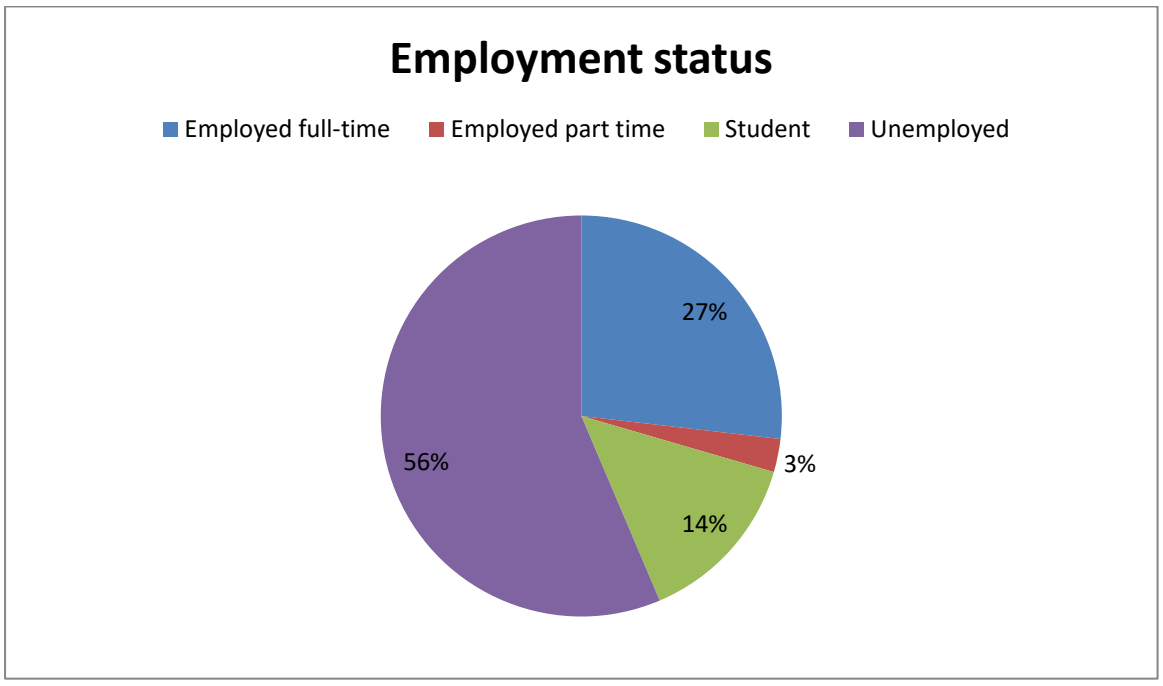
3.5 EMPLOYMENT STATUS

Table 3.5 Employment status

Responds	Number of respondents	Percentage of respondents
Employed full-time	40	57.1%
Employed part-time	4	5.7%
Student	21	30%
Unemployed	5	7.1%

Source: Primary Data

Figure 3.5 Employment Status



Source : Primary Data

The above given data shows the employment status of the respondents. According to the data , majority of the respondents are employed full time . The next percentage is followed by students which constitute a thirty percentage of respondents.

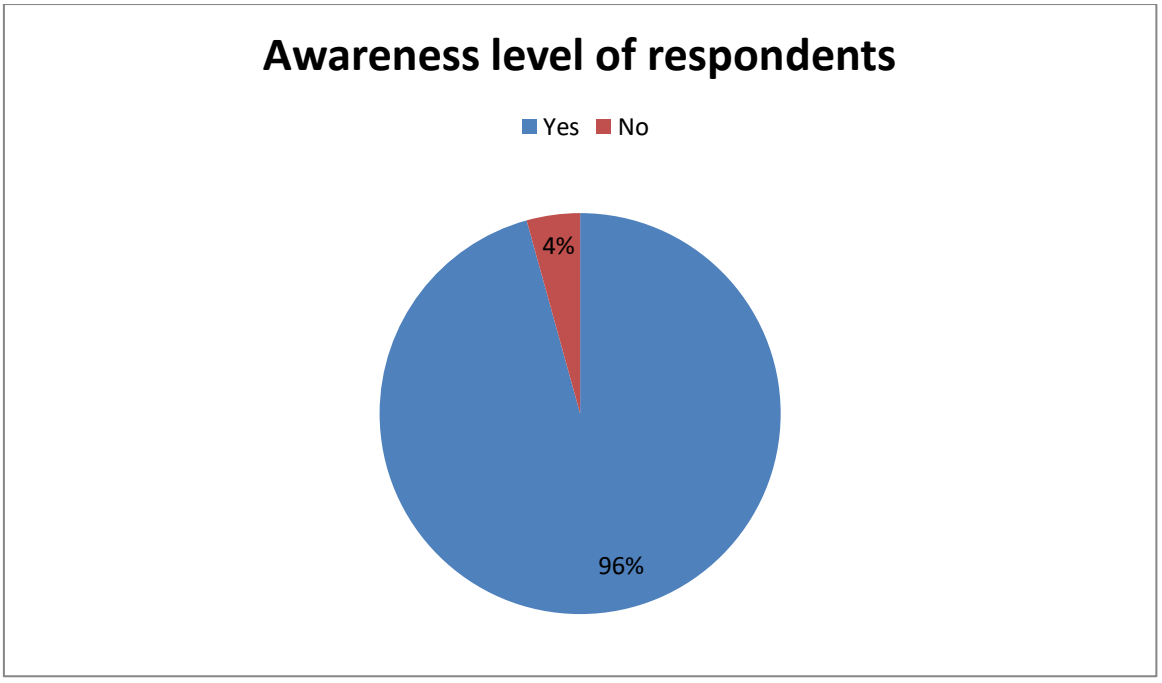
3.6 AWARENESS LEVEL OF RESPONDENT TOWARDS TWO-WHEELER ELECTRIC VEHICLE

Table 3.6 Awareness level towards two-wheeler EV

Awareness	Number of Respondents	Percentage of Respondents
Yes	67	95.7%
No	3	4.3%

Source: Public Data

Figure 3.6 Awareness level towards two-wheeler EV



Source : Primary Data

The above given data shows the awareness level of the respondents towards two-wheeler electric vehicle. According to the data, the majority of the respondents are aware about electric two-wheeler. Ninety-six percentage of respondents are aware about it and four percentage of the respondents are unaware about of it.

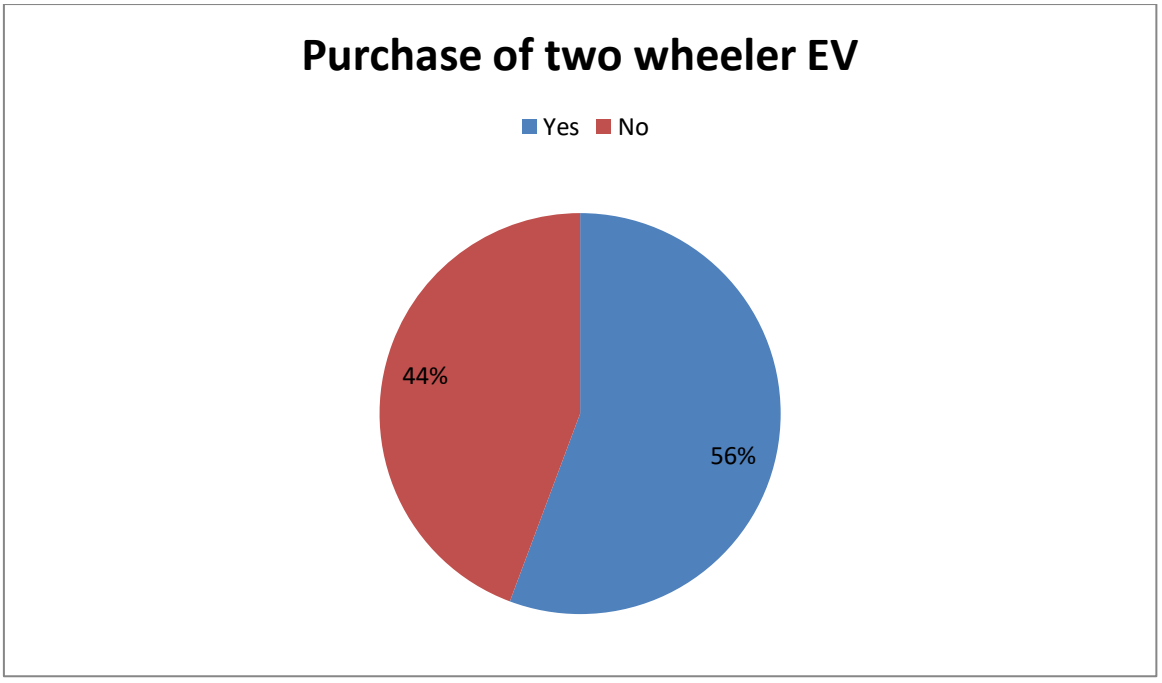
3.7 CONSIDERATION ON PURCHASING OR USING TWO-WHEELER EV

Table 3.7 Purchase of two-wheeler EV

Responds	Number of respondents	Percentage of respondents
Yes	39	55.7%
No	31	44.3%

Source: Primary Data

Figure 3.7 Purchase of two-wheeler EV



Source : Primary Data

The data depicts that majority of the respondents are considering to purchase or use a two-wheeler electric vehicle. This shows their interest on using it or purchasing it. Fifty -six percentages of respondents consider to purchase or using it and forty-four percentage of respondents are not considering to purchase two-wheeler electric vehicle.

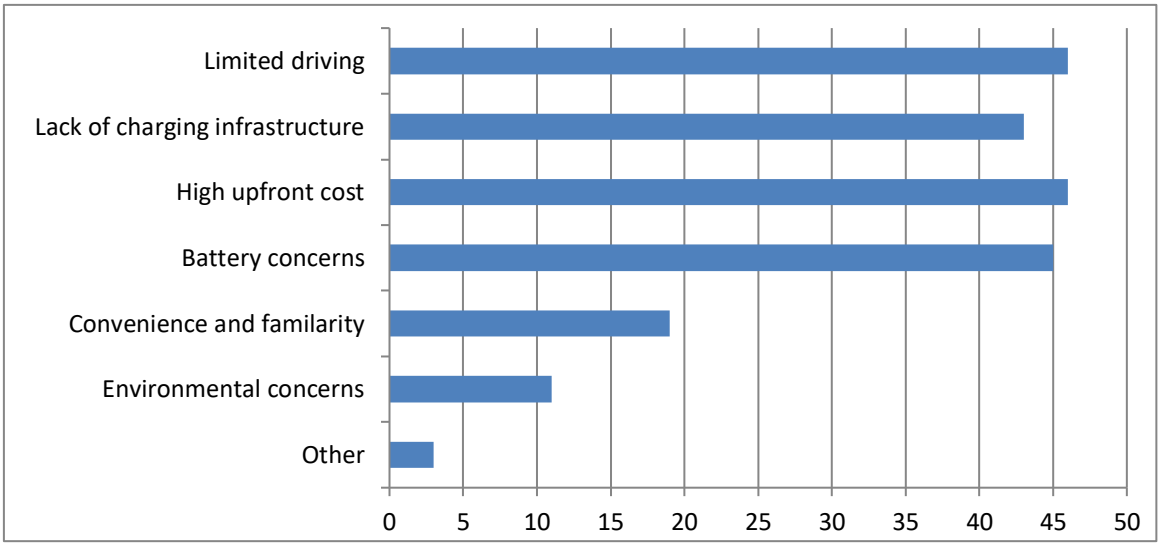
3.8 FACTORS WHICH INFLUENCED THE DECISION TO NOT USE TWO-WHEELER ELECTRIC VEHICLE

Table 3.8 factors influenced to not use EV

Factors	Number of Respondents	Percentage of Respondents
Limited driving	46	65.7%
Lack of charging infrastructure	43	61.4%
High upfront cost	46	65.7%
Battery concerns	45	64.3%
Convenience and familiarity with two-wheeler electric vehicle	19	27.1%
Environmental concerns	11	15.7%
Others	3	4.3%

Source: Primary Data

Figure 3.8 factors influenced to not use EV



Source: Public Data

The respondents had multiple responds for this question. Around sixty-five percentage have considered limited driving and high upfront cost as the primary reason for not to purchase a

two-electric vehicle. Around sixty-four percentage of respondents choose battery concerns for not to use two-wheeler electric vehicle.

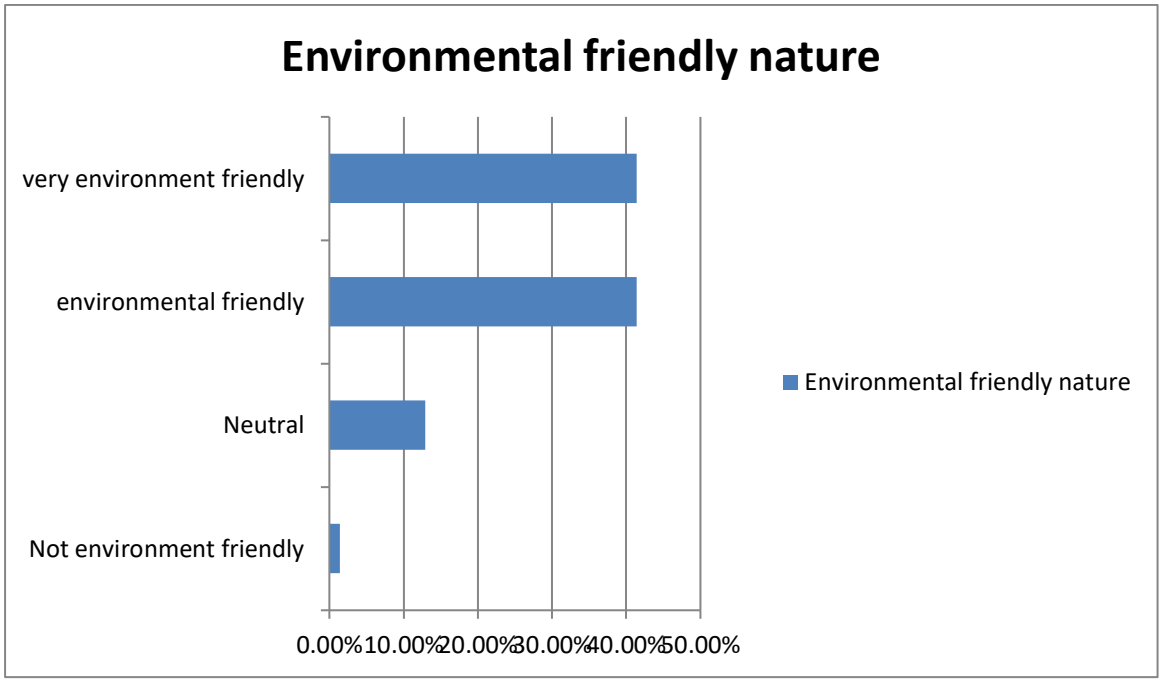
3.9 CONSUMER PERSPECTIVE ON THE ENVIRONMENT FRIENDLY NATURE OF EV COMPARED TO TRADITIONAL VEHICLE

Table 3.9 Perspective on EVs environmental friendly nature

Responds	Number of respondents	Percentage of Respondents
Very environmental friendly	31	44.3%
Environmental friendly	29	41.4%
Neutral	9	12.9%
Not environmental friendly	1	1.4%
Not at all	0	0

Source: Primary Data

Figure 3.9 perspectives on EVs environmental friendly nature



Source: Primary Data

The respondents had multiple responds for this question. Majority of the respondents opt charging infrastructure as the important feature if they consider purchasing two-wheeler electric vehicle. The next percentage chooses affordability of the vehicle. Around sixty-three

percentages of respondents choose silent driving as the important feature while considering purchasing electric vehicle.

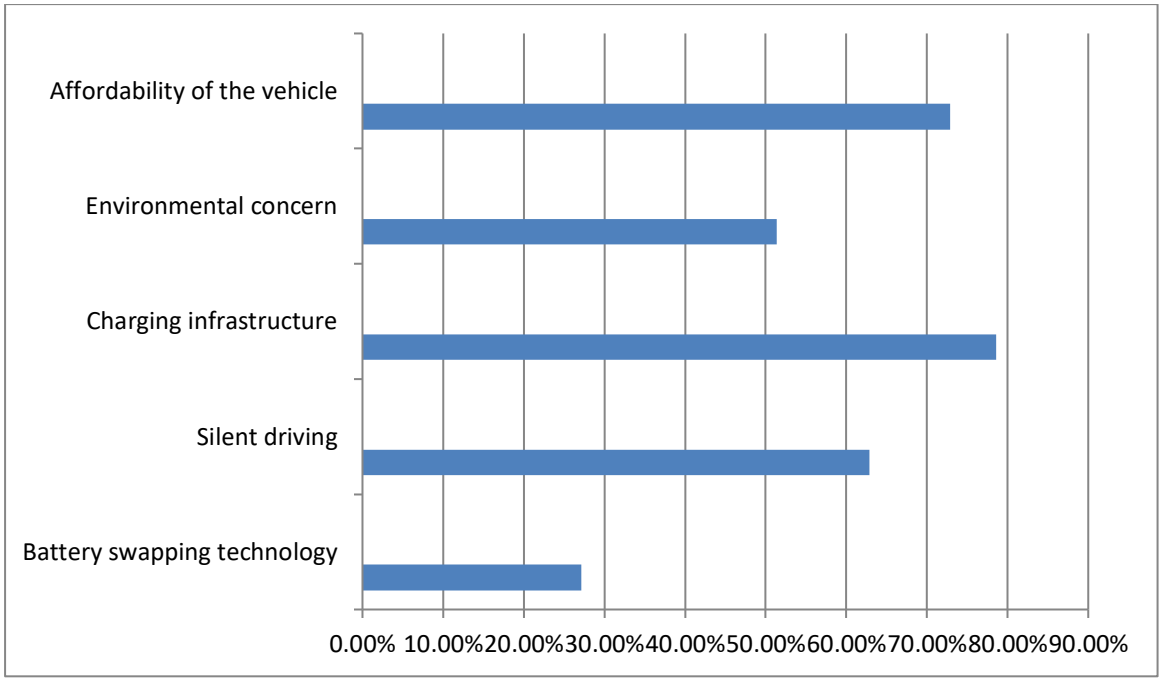
3.10 IMPORTANT FEATURES CONSIDER WHILE PURCHASING TWO-WHEELER EV

Table 3.10 features considered while purchasing EV

Features	Number of respondents	Percentage of respondents
Affordability	51	72.9%
Environmental concern	36	51.4%
Charging infrastructure	55	78.6%
Silent driving	44	62.9%
Battery swapping technology19	19	27.1 %

Source: Primary Data

Figure 3.10 features considered while purchasing EV



Source: Primary Data

The respondents had multiple responds for this question .Majority of the respondents chooses charging infrastructure as the important feature if the considers to purchase EV.

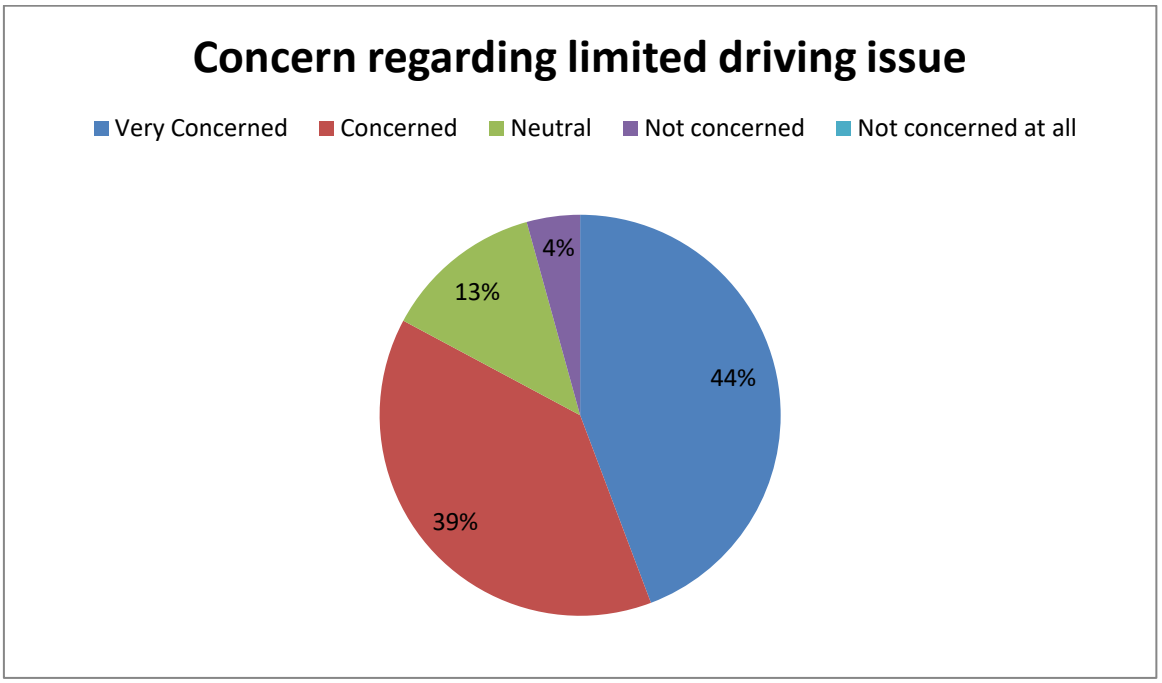
3.11 CONCERN ABOUT THE LIMITED DRIVING RANGE OF TWO-WHEELER EV

Table 3.11 limited driving range of two-wheeler EV

Responds	Number of respondents	Percentage of respondents
Very concerned	31	44.3%
Concerned	27	38.6%
Neutral	9	12.9%
Not concerned	3	4.3%
Not concerned at all	0	0

Source: Primary Data

Figure 3.11 limited driving range issue



Source : Primary Data

The data depicts that around forty-four percentages of respondents are very concerned about the limited driving range of two-wheeler electric vehicle. The next percentage around thirty - nine are also concerned about the driving range. Around thirteen percentage of respondents choose neutral as their choice.

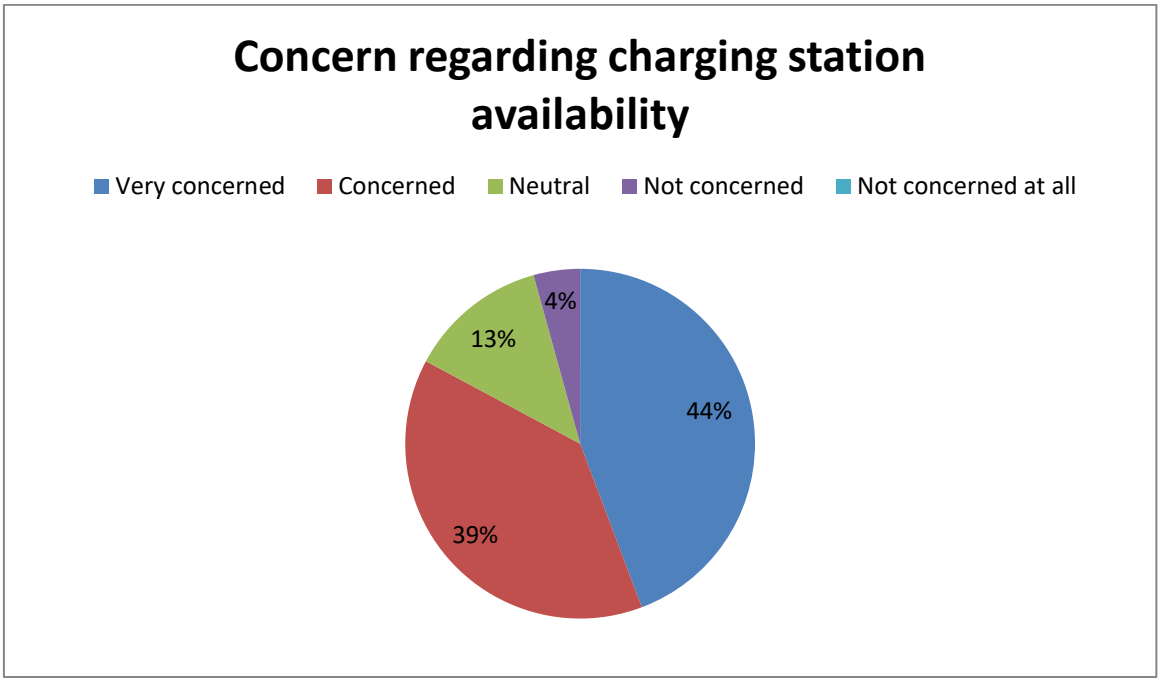
3.12 CONSUMERS CONCERN REGARDING THE AVAILABILITY OF CHARGING STATIONS OF TWOWHEELER ELECTRIC VEHICLE

Table 3.12 Availability of charging station for EV

Responds	Number of responds	Percentage of respondents
Very concerned	31	44.3%
Concerned	27	38.6%
Neutral	9	12.9%
Not concerned	3	4.3%
Not concerned at all	0	0

Source: Primary Data

Figure 3.12 Availability of charging station for EV



Source: Primary Data

Even in this data, approximately forty-four percentage of the respondents have very concern regarding the availability ofcharging stations. The percentage of respondents who choose neutral are around twelve.

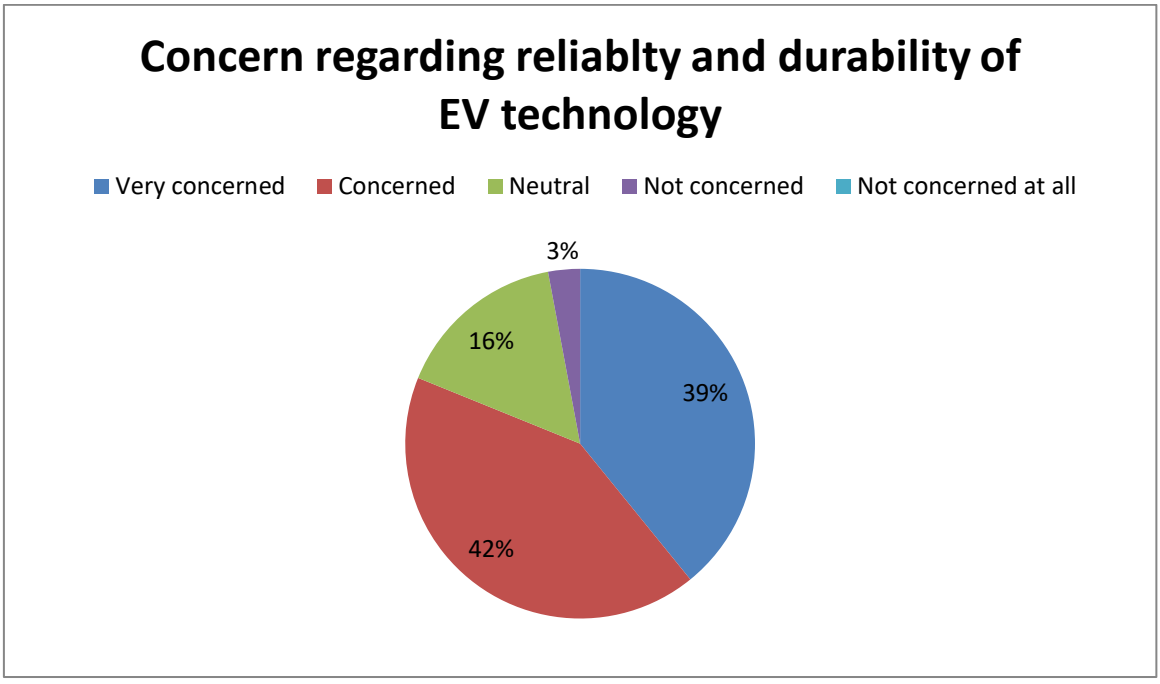
3.13 CONSUMERS CONCERN ABOUT THE RELIABILITY AND DURABILITY OF EV TECHNOLOGY

Table 3.13 Reliability and durability of EV technology

Responds	Number of respondents	Percentage of respondents
Very concerned	27	38.6%
Concerned	29	41.4%
Neutral	11	15.7%
Not concerned	2	2.9%
Not concerned at all	1	1.4%

Source : Primary Data

Figure 3.13 Reliability and durability of EV technology



Source : Primary Data According to the data , around forty-two percentage of respondents are concerned about the reliability and durability of EV technology .Around thirty-nine percentage is very concerned about the EV technology's reliability and durability . Around three percentage are not concerned on its technology. And only two percentage are not at all concerned about the EV's reliability and durability.

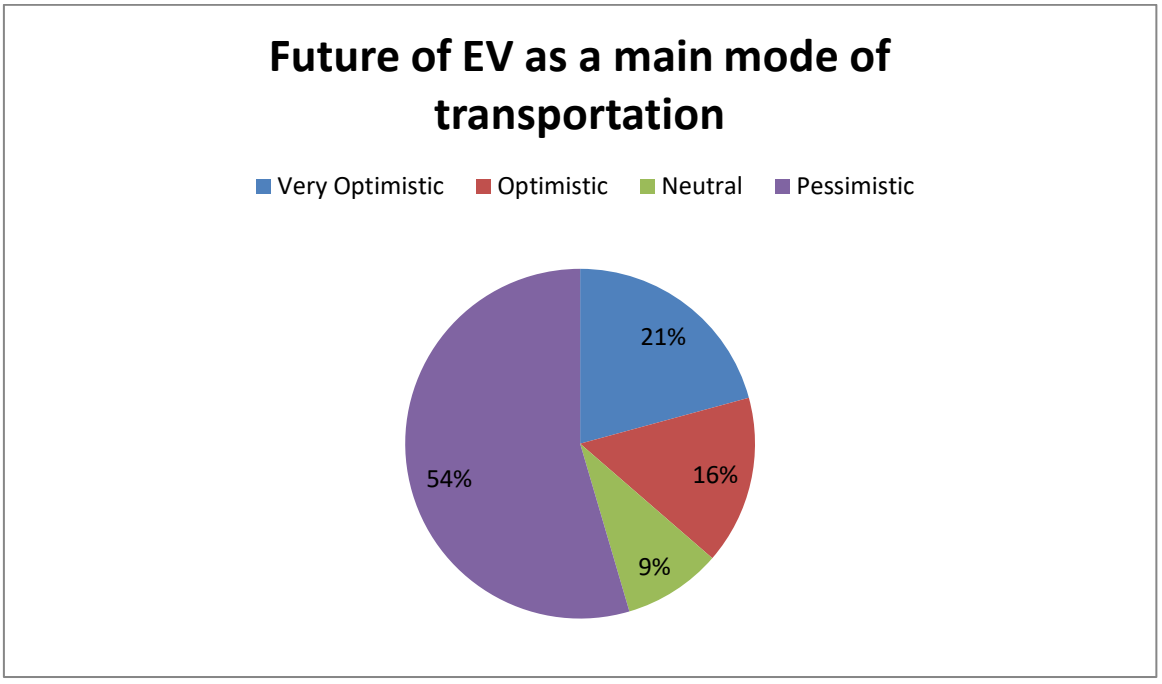
3.14 FUTURE OF EV AS A MAIN STREAM MODE OF TRANSPORTATION

Table 3.14 future of EV as a main mode of transportation

Responds	Number of respondents	Percentage of respondents
Very optimistic	32	45.7%
Optimistic	24	34.3%
Neutral	14	20%
Pessimistic	0	0
Very pessimistic	0	0

Source : Primary Data

Figure 3.14 Future of EV as a means of transportation



Source : Primary Data

According to the data, around forty-six percentage of the respondents commented very optimistic on the future of electric vehicle as a mainstream mode of transportation. Around thirty-five percentage of respondents have optimistic view on the comment. Only twenty percentage have a neutral perspective .

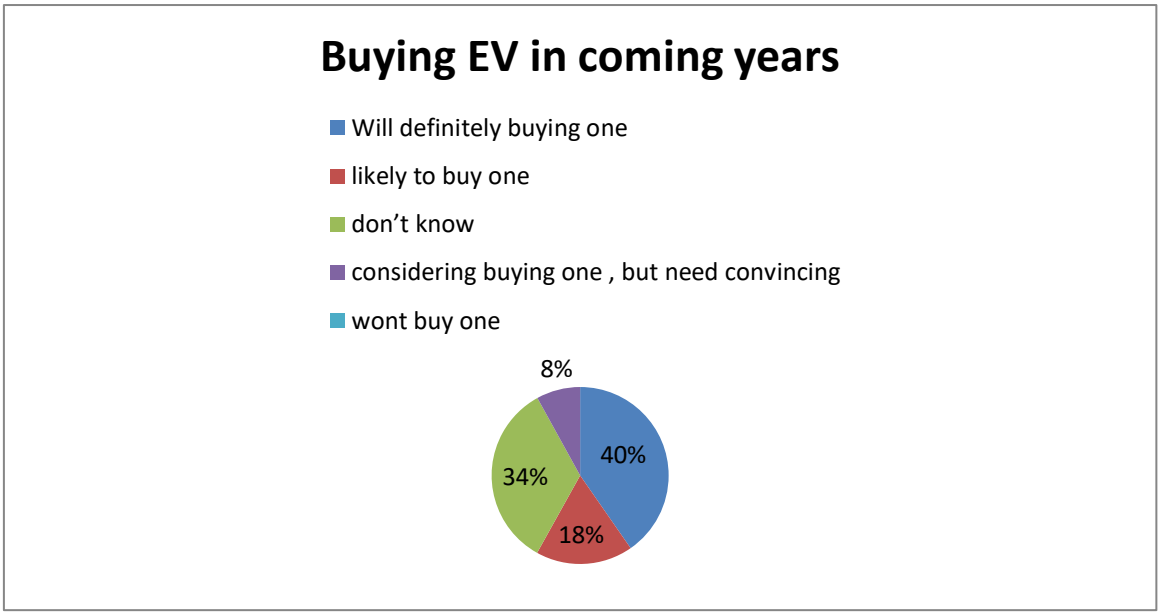
3.15 CONSIDERATION OF BUYING TWO-WHEELER ELECTRIC VEHICLE IN COMING YEARS

Table 3.15 Buying two-wheeler in coming year.

Responds	Number of respondents	Percentage of respondents
Will definitely buy one	25	35.7%
Likely to buy one	11	15.7%
Don't know	21	30%
Considering buying one , but need convincing	5	7.1%
Definitely wont buy one	8	11.4%

Source : Primary Data

Table 3.15 buying two-wheeler in coming years



Source : Primary Data

The data shows that, around thirty-six percentage of the respondents will definitely buy a two-wheeler electric vehicle in the coming years. The next thirty percentage is also likely to buy one in the coming years. The next thirty percentage doesn't know whether they will buy or not . Around eight percentage is considering buying one , but they need convincing to buy an two-wheeler electric vehicle .The rest ten percentage is not considering to buy electric vehicle in the coming years .

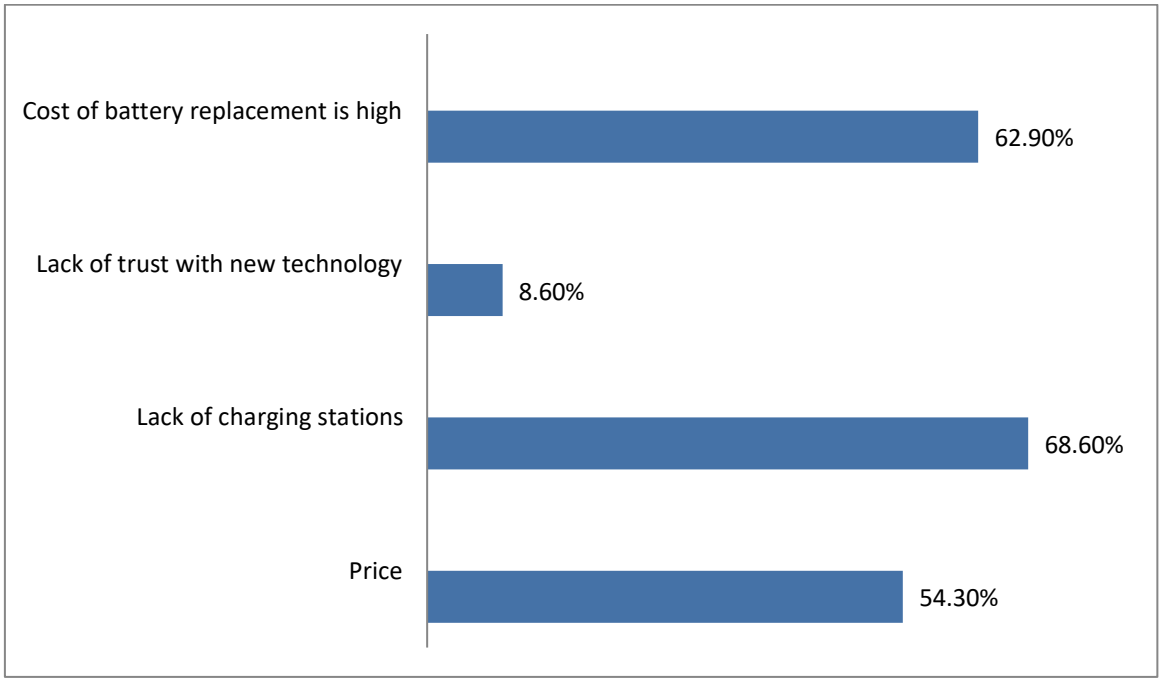
3.16 FACTORS DISCOURAGING FROM USING A TWO-WHEELER ELECTRIC VEHICLE

Table 3.16 Discouraging factors from using EV

Factors	Number of respondents	Percentage of respondents
Price	38	54.3%
Lack of charging station	48	68.6%
Lack of trust with the technology	6	8.6%
Cost of battery replacement is high	44	62.9%

Source : Primary Data

Figure 3.16 discouraging factors from using EV



Source : Primary Data

The respondents had multiple responds toward this question . Around sixty nine percentage of respondents consider price as the discouraging factor to buy a two-wheeler electric vehicle . The other percentage of sixty-three respondents consider cost of battery replacement as the reason to discourage them from purchasing it .

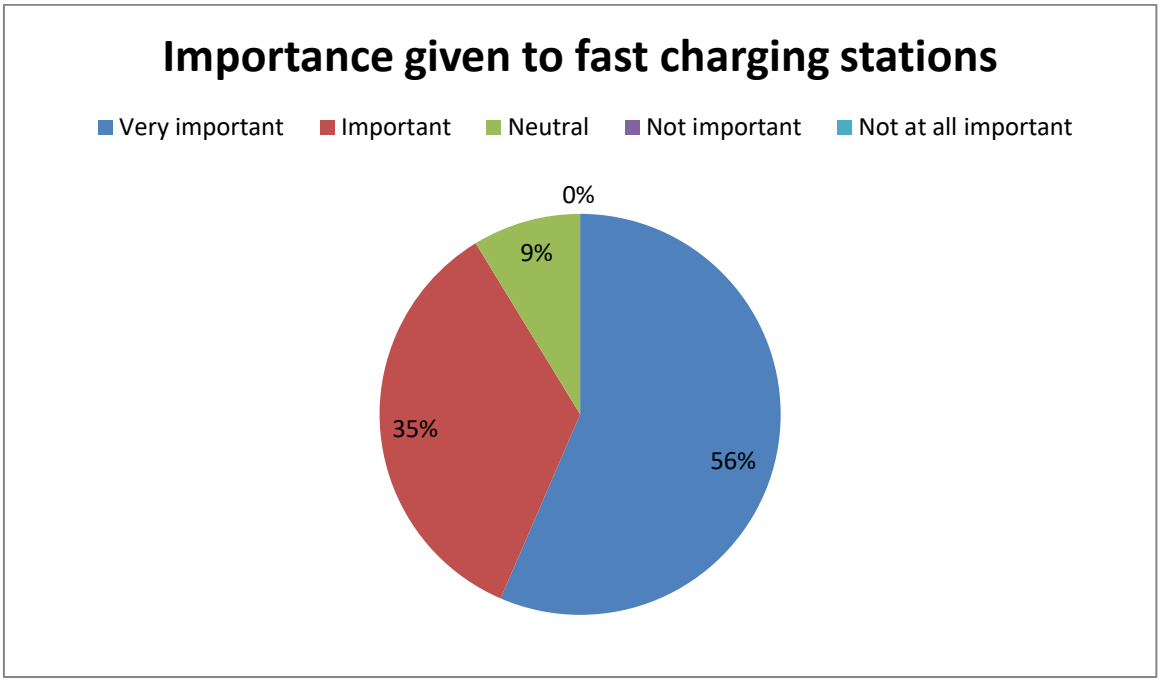
3.17 IMPORTANCE OF AVAILABILITY OF FAST CHARGING STATIONS WHEN CONSIDERING TO BUY EV

Table 3.17 Importance of fast charging station

Responds	Number of respondents	Percentage of respondents
Very important	39	55.7%
Important	24	34.3%
Neutral	6	8.6%
Not important	0	0
Not important at all	1	1.4%

Source : Primary Data

Figure 3.17 Importance given to fast charging stations



Source : Primary Data

The data shows that around fifty-six percentages of the respondents have choose very important option about the availability of fast-charging stations to purchase two-wheeler electric vehicle. Only two percentages consider not important at all of the availability of fast charging stations for two-wheeler electric vehicle.

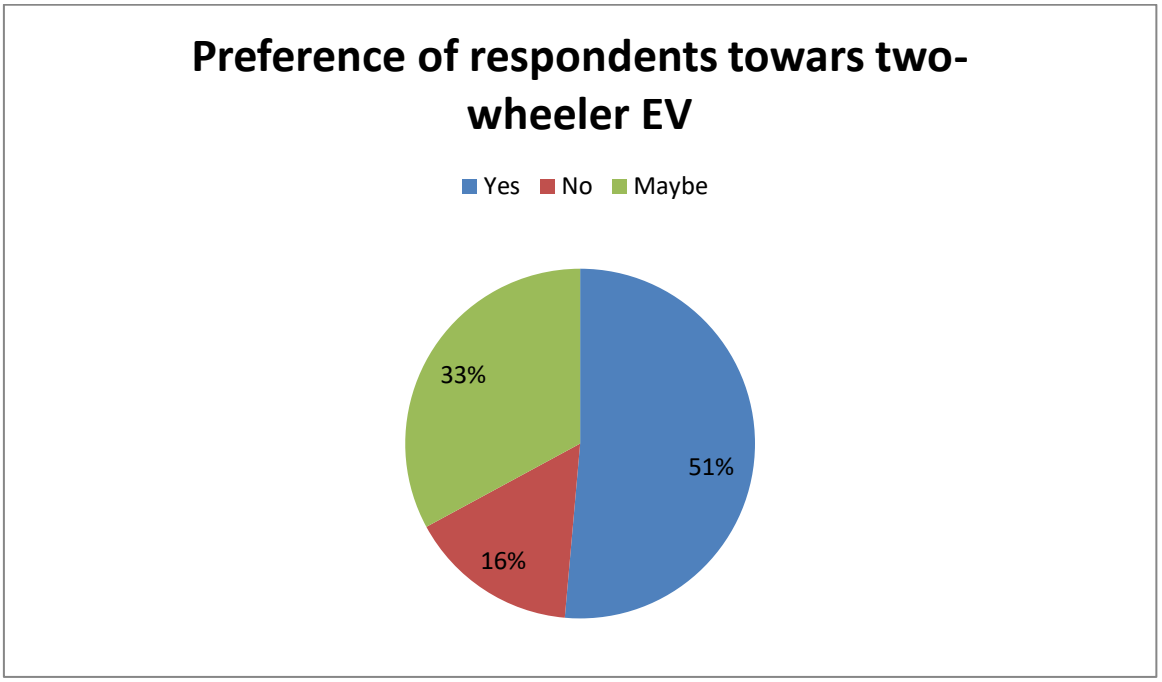
3.18 PREFERENCE ON TWO-WHEELER EV OVER REGULAR VEHICLE

Table 3.18 Preference on two-wheeler EV over regular vehicle.

Responds	Number of respondents	Percentage of respondents
Yes	36	51.4%
No	11	15.7%
Maybe	23	32.9%

Source: Primary Data

Figure 3.18 preferences on two-wheeler EV over regular vehicle.



Source : Primary Data

The above data shows that, around fifty-two percentage of respondents will prefer two-wheeler electric vehicle over regular vehicle if a choice is given . This shows that the respondents having a positive attitude towards the preference of two-wheeler electric vehicle. Around thirty-three percentage of respondents may or may not prefer two-wheeler electric vehicle over traditional vehicle.

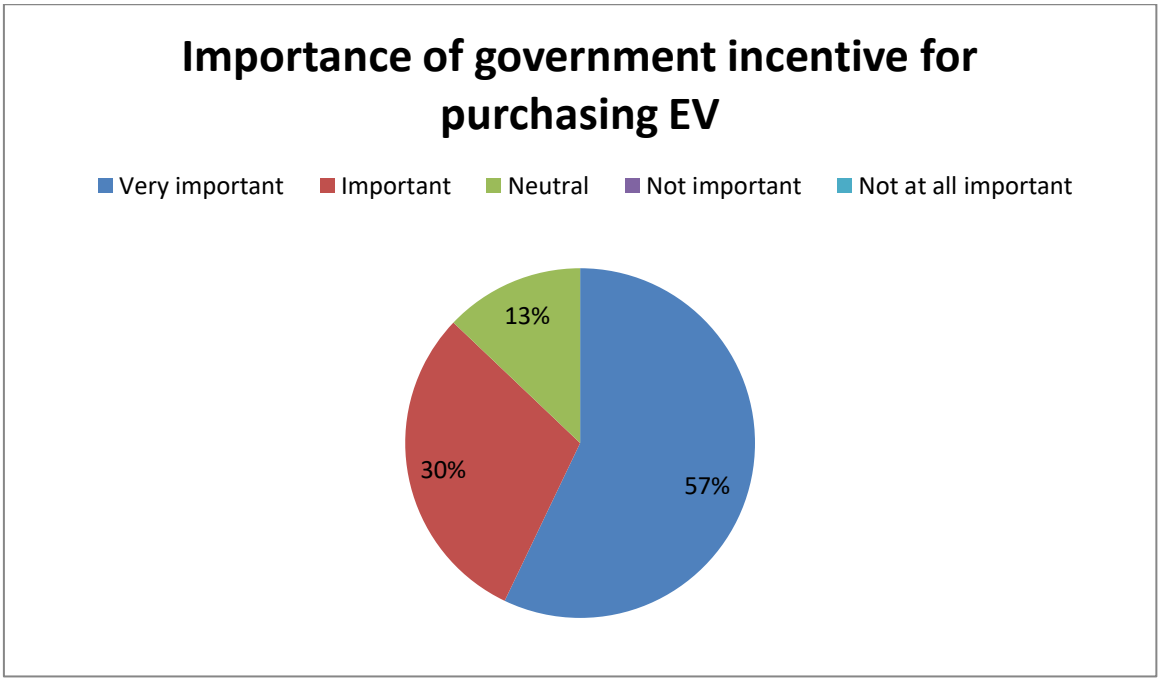
3.19 GOVERNMENTS INCENTIVE AND SUBSIDIES INFLUENCE ON CONSUMER TO CONSIDER PURCHASING ON TWO-WHEELER ELECTRIC VEHICLE

Table 3.19 importance of government incentive to purchase EV

Responds	Number of respondents	Percentage of respondents
Very important	40	57.1%
Important	21	30%
Neutral	9	12.9%
Not important	0	0
Not important at all	0	0

Source : Primary Data

Figure 3.19 importance of government incentive to purchase EV



Source : Primary Data

The data shows that around fifty-six percentage responded that , Government incentives and subsidies influence are very important for consumers to consider purchasing on two-wheeler Electric Vehicle .Thirty percentage also responded that government incentives are important

to influence them to consider purchase electric vehicle . The rest thirteen percentage showed a neutral response to this question.

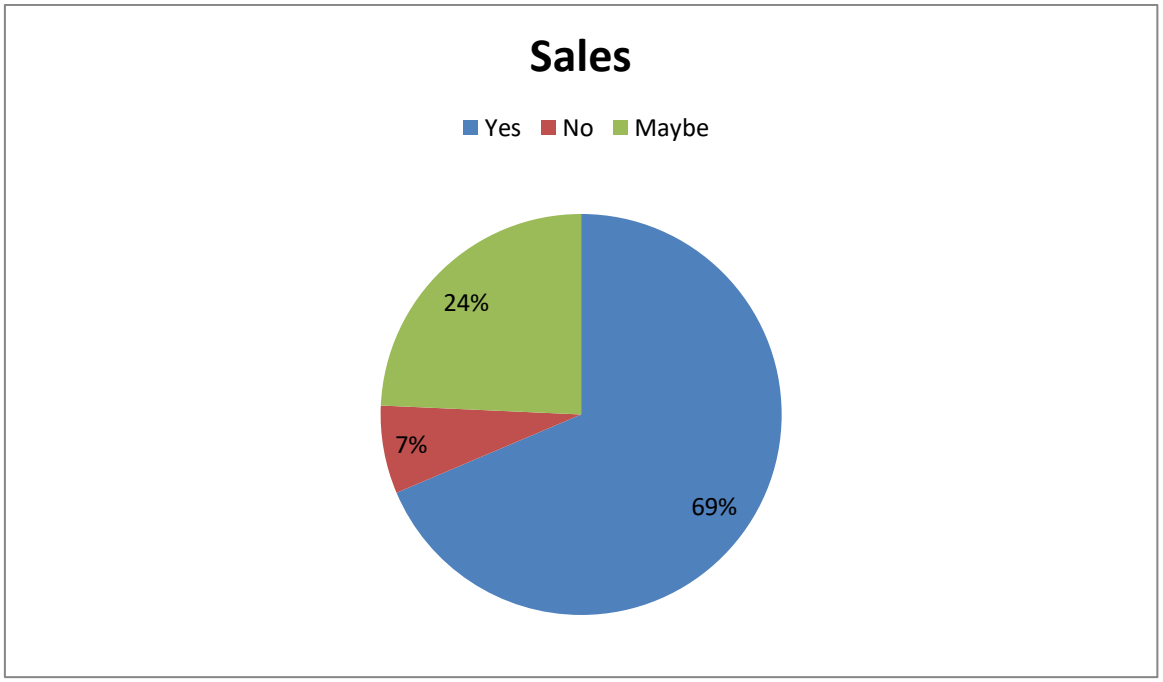
3.20 CONSUMER'S INTENTION ON PURCHASING TWO-WHEELER ELECTRIC VEHICLE FOR GETTING SUBSIDIES

Table 3.20 Purchasing two-wheeler EV for getting subsidies

Responds	Number of respondents	Percentage of Respondents
Yes	48	68.65%
No	5	7.1%
Maybe	17	24.3%

Source : Primary Data

Figure 3.20 Purchasing two-wheeler EV for getting subsidies



Source : Primary Data

The majority of the respondents of sixty-seven percentage would be considering purchasing two-wheeler electric vehicle if more subsidies and incentives are available. This data implies that around eight percentages of respondents is not likely to consider purchasing electric vehicle even if there is a government initiative or subsidies available.

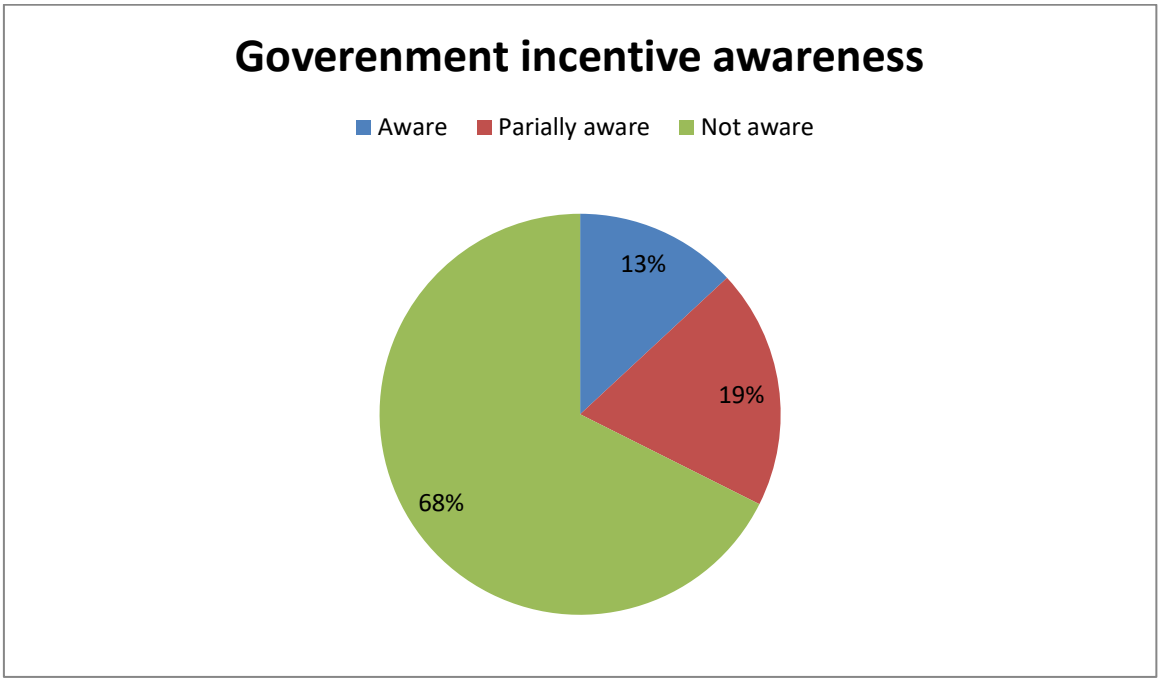
3.21 AWARENESS OF GOVERNMENT INCENTIVES FOR THE PROMOTION OF EV

Table 3.21 Government incentive Awareness

Responds	Number of responds	Percentage of respondents
Aware	19	27.1%
Partially Aware	28	40%
Not aware	23	32.9%

Source : Primary Data

Figure 3.21 Government incentives awareness



Source : Primary Data

The data shows that forty percentages of the respondents are partially aware of government incentives or initiatives for the promotion of electric vehicle. Around twenty-eight percentages are aware about the government incentives or initiatives for promoting electric vehicle.

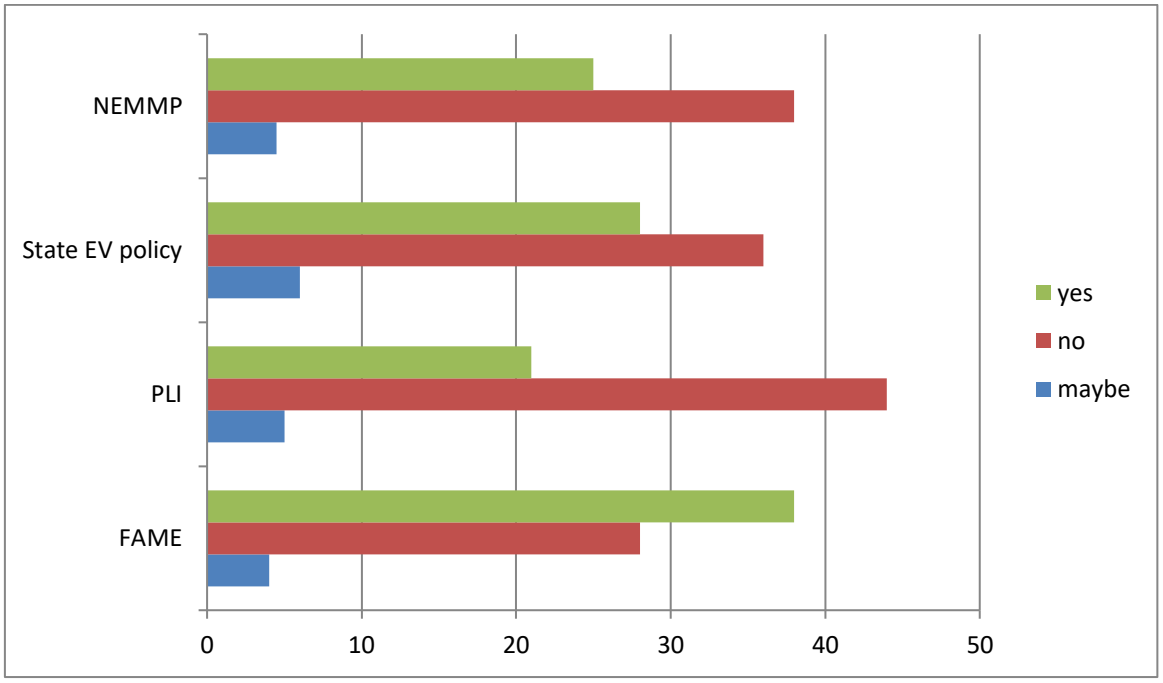
3.22 CONSUMER AWARENESS ON GOVERNMENT INCENTIVES

Table 3.22 consumer awareness on Government incentives for EV

Incentives	YES	NO	MAYBE
FAME	38	28	4
PLI Scheme	21	44	5
State EV policies	28	36	6
NEMMP	25	38	7

Source : Primary Data

Figure 3.22 awareness on government incentives



Source : Primary Data

The respondents had multiple responds toward this question. The data shows that around thirty-nine percentages of respondents are aware about the initiative Faster Adoption and Manufacturing of Hybrid and electric vehicles. Around twenty percentage areas are aware about the Production Linked Incentive. The next percentages thirty-six are aware about State EV policies. And the twenty-five percentage know NEMMP initiative by the government.

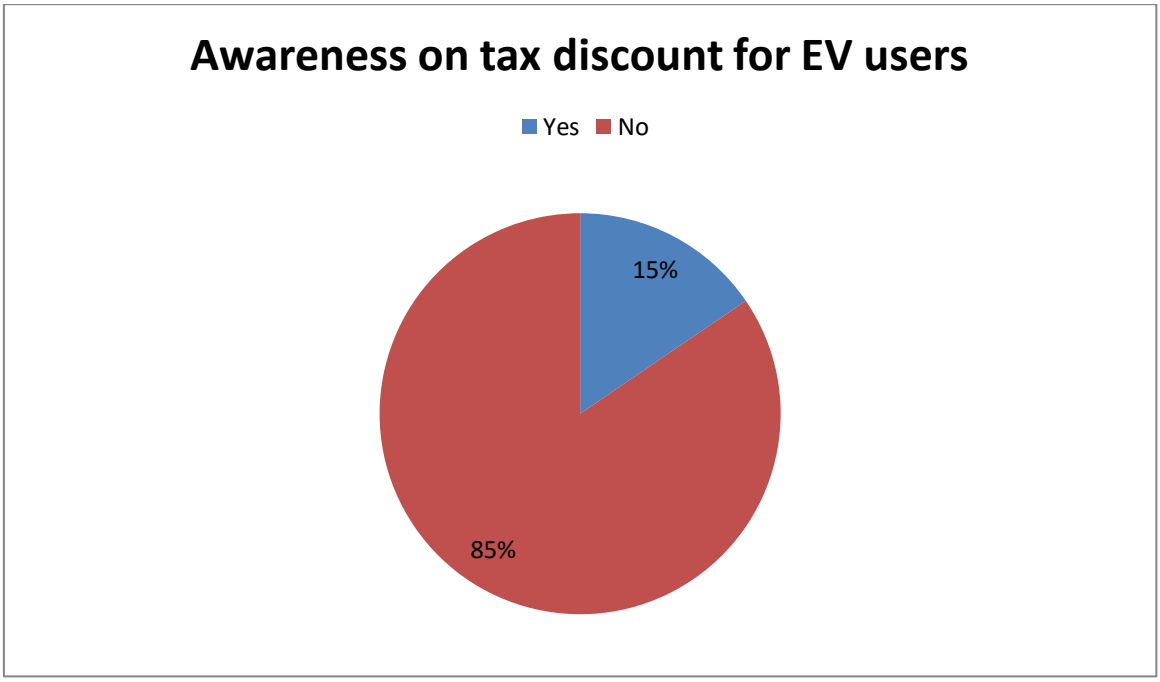
3.23 AWARENESS OF 50% TAX DISCOUNT PROVIDED FOR FIRST FIVE YEARS

Table 3.23 Awareness of tax discount provided for first five years .

Responds	Number of respondents	Awareness of respondents
Yes	41	58.6%
No	29	41.4%

Source : Primary Data

Figure 3.23 Awareness on tax discount provided.



Source : Primary Data

The data shows that around fifty-nine percentage of respondents are aware about the fifty percentage tax discount provided for EV users for the first five years . The rest of the percentage are not aware about the tax discount provided in the first five years for EV users

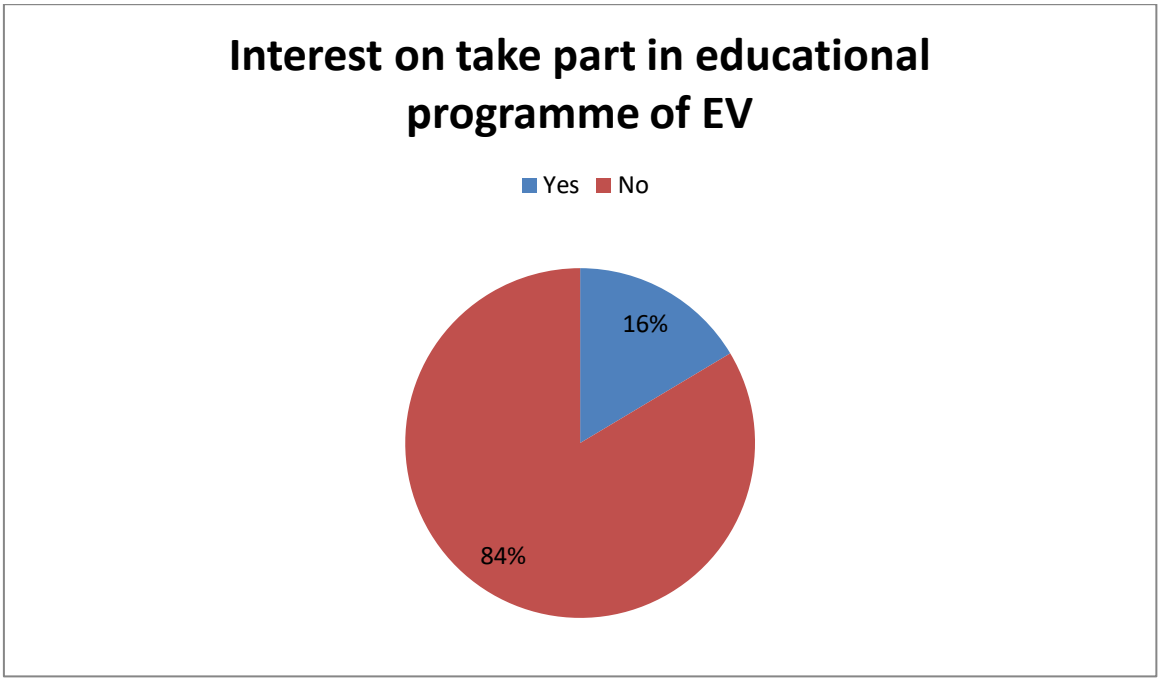
3.24 INTEREST IN ATTENDING WORKSHOP OR EDUCTIONAL PROGRAMME ABOUT EV

Table 3.24 interest in attending workshop about EV

Responds	Number of respondents	Percentage of respondents
Yes	44	62.9%
No	26	37.1%

Source : Primary Data

Figure 3.24 interests in participating workshop about EV



Source : Primary Data

The data depicts that around sixty-three percentages of the respondents are interested to participate in education programs or workshop about EV. The next percentage around thirty-seven shows no interest to participate in workshop or education program related to EV.

CHAPTER -4

FINDINGS, RECOMMENDATIONS AND CONCLUSION

4.1 FINDINGS

➢ According to the data collected, it could be seen that majority of the respondents are female. And the remaining respondents are male.

➢ Majority of the respondents comes under the age category between eighteen and twenty-four. The likes and dislikes of consumers on two-wheeler electric vehicle can be seen in the data collected. 57.1% of the respondents were employed full-time and 30% of the respondents are student and 7.1 % of them were unemployed and the rest of the percentage were part-time employed.

➢ It could be observed that majority of the respondents of around 96 % are aware of two-wheeler electric vehicles.

➢ Among them around 56% respondents are considering to purchase or using an electric vehicle.

➢ Charging stations are the main factor they consider when purchasing a two-wheeler electric vehicle. Environmental impacts, prices of the vehicle is also consider while purchasing it .

➢ Using a two-wheeler electric vehicle have great impact on environment , because they emit zero-carbon to the environment . Majority of the respondents are partially aware about the government initiatives related to electric vehicle .

➢ Around fifty-nine respondents are aware about the 50% tax discount provided by the government for electric vehicle for the first five years .

➢ More than half of the respondents are interested to participate in educational programs or workshop regarding electric vehicles . This shows their interest to know more about electric vehicles .

4.2 RECOMMENDATIONS

➢ Carbon emission leads to global warming and climate change creating so many problems in the lives of living beings. To reduce carbon emissions one of the important changes that a person can bring towards the society would be adopting two-wheeler electric vehicle as their means of transportation

➢ Individuals are not fully aware about the Government incentives to promote electric vehicles, so by providing classes for all age category on the importance of electric vehicle would create more awareness regarding the protection of environment.

➢ If the battery replacement cost, charging infrastructure, limited driving range issues are sought out many individuals will definitely purchase two-wheeler electric vehicle.

➢ Government aims to have 100% of electric vehicles by 2030, in order to make it a reality, government can bring rules like making it a compulsion to use electric vehicle.

➢ More charging station is necessary while considering to purchase two-wheeler electric vehicle. Installing charging stations at intervals of every 1 kilometer.

4.3 CONCLUSION

India has to shift to a more energy-efficient vehicle due to the depletion of fossil fuels and the ongoing rise in fuel prices. The government has acted to reduce pollution levels by encouraging electric vehicle and providing incentives. In an effort to increase output, the government has loosened FDI regulations. In India, a number of upand-coming businesses are introducing electric two-wheeler as well as other electric vehicles too. Together, the government and automakers should develop the necessary infrastructure and foster an atmosphere that supports electric vehicles. The respondents are prepared to switch from conventional to environmentally friendly two-wheeler vehicles since they are conscious of the state of the world's climate. Expense is a crucial consideration when buying an electric vehicle. If appropriate measures are taken respondents are willing to explore buying electric two-wheeler in the future .

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QUESTIONNAIRE

1)Name

2) Gender

- Female
- . Male

3. Age

- 18-24
- 25-35
- 36-50
- Above 50

4. Education

- Highschool
- Bachelor’s degree
- Master’s degree
- Other

5. Employment status

- Employed full time
- Employed part time
- . Unemployed
- Student

6. Are you aware of electric vehicles?

- Yes
- No

7. Have you ever considered purchasing or using an electric vehicle ?

- Yes

- No

8. What factors influence your decision not to use an electric vehicle ?

- Limited driving range
- . Lack of charging infrastructure
- High upfront cost
- Battery concerns
- Convenience and familiarity with traditional vehicles
- Environmental concerns

9. Which of the following factors would you consider while buying an e- vehicle ?

- Re-sale Value
- Environmental impacts
- Prices
- Charging Stations

10.How environmentally friendly do you perceive electric vehicles compared to traditional Gasoline/diesel vehicles?

- Very environment friendly
- Environmental friendly
- Neutral
- Not environmental friendly
- Not at all environment friendly

12.What are the important features consider while purchasing an electric vehicle?

- . Affordability of the vehicle
- Environmental concern
- Charging infrastructure
- Government incentives
- Silent driving
- . Battery swapping technology

- Other (specify)

13.How concerned are you about the limited driving range of electric vehicles?

- Very concerned
- Concerned
- Neutral
- .Not concerned
- Not concerned at all

14.How concerned are you about the availability of charging infrastructure for electric vehicles in your area?

- Very concerned
- Concerned
- Neutral
- Not concerned
- Not concerned at all

15. How concerned are you about the reliability and durability of electric vehicle technology?

- . Very Concerned
- . Concerned
- Neutral
- Not Concerned

16.How optimistic are you about the future of electric vehicles as a mainstream mode of transportation?

- Very Optimistic
- Optimistic
- Neutral
- Pessimistic
- . Very Pessimistic

17.Would you be more likely to consider purchasing an electric vehicle if there were more incentives or subsidies available?

- Yes
- No
- Maybe

18. Will you consider buying an EV in the coming years?

- . Will definitely buy one
- . Am likely to buy one
- Don't know
- Am considering buying one, but need convincing
- . Definitely won't buy one.

19.What factors discourage you to consider buying an electric vehicle ?

- Price
- Less number of charging stations
- Lack of trust with the new Technology
- . Cost of Battery replacement

20 .How important is the availability of fastcharging stations for electric vehicles in your consideration of purchasing one ?

- Very important
- Important
- Neutral
- Not important
- Not important at all

21. Are you aware of any government incentives related to EV ?

- Aware
- Partially aware
- Not aware

22 . Are you aware of any of the government scheme?

SCHEME	YES	NO	MAYBE
FAME			
PLI scheme			
State EV policy			
NEMMP			

23. Are you aware of the 50% discount provided by the government for the EV ?

- Yes
- No

24 . If given a choice would you prefer EV over regular vehicle ?

- Yes
- No

25 . Are you interested to participate in educational programme or workshop about EV ?

- Yes
- No