

“A STUDY ON CONSUMER PERCEPTION TOWARDS ELECTRIC VEHICLES IN ERNAKULAM DISTRICT”

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BONAFIDE CERTIFICATE

This is to certify that this dissertation entitled “**A STUDY ON CONSUMER PERCEPTION TOWARDS ELECTRIC VEHICLES IN ERNAKULAM DISTRICT**”, has been prepared by **Aayisha Raihan, Thahasin K M, Anandhakrishna P S** under my supervision and guidance in partial fulfilment of the requirement for the Degree of Bachelor of Commerce of Mahatma Gandhi University. This is also to certify that this report has not been submitted to any other institute or university for the award of any degree.

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CHAPTER - 1
INTRODUCTION

1.1 INTRODUCTION

An electric vehicle (EV) is defined as a vehicle that employs one or more electric motors or traction motors for propulsion by (Wikipedia). An electric vehicle can be self-contained using a battery, solar panels, fuel cells, or an electric generator to convert fuel to energy, or it can be fuelled through a collector system by electricity from sources outside the vehicle. When electricity was one of the most widely used sources of motor vehicle power in the middle of the 19th century, EVs first became widely available. They provided a level of comfort and usability that the era's petrol cars were unable to equal. Modern internal combustion engines have dominated motor vehicle propulsion for over a century, while other vehicle types, such as trains and smaller vehicles of all kinds, have continued to be mostly propelled by electric power. There is growing public awareness of environmental challenges in recent years. Since industrialization began to reveal its effects, mankind has been continuously exploiting the environment for at least 200 years. Recent years have witnessed an increase in unanticipated natural disasters such as floods, famines, earthquakes, and tsunamis. The most recent flood in Kerala and the landslide in Kodagu are the finest examples of this (Aug 2018). Some of the settlements almost vanished; the natural world simply ate up the roads and buildings in the blink of an eye.

Environmental contamination is the only cause of the aforementioned destructions. The total contamination of the air, water, and soil is widely recognized. Two significant components, such as industrialization and motor cars, may be found if we follow the causes of this environmental contamination from the very beginning. One research claims that in metropolitan settings, between 50 and 80 percent of carbon monoxide emissions are produced by cars. In large cities, Indians have trouble breathing. Smog recently caused a lot of suffering for the residents of Delhi. People were unable to even breathe. A holiday was proclaimed for schools. Due to the inability to see each other, many automobiles collided. People were seen moving while wearing masks. The Delhi government-imposed restrictions on the entry of cars. This incident demonstrates that using CNG (compressed natural gas) alone will not solve the pollution problem.

1.2 STATEMENT OF PROBLEM

The project's focus is "a study on customers' attitudes regarding electric vehicles: with particular attention to youth." The study's goal is to examine current electric car possibilities as well as customer attitudes towards and desires for electric vehicles, particularly among young people. The study would aid in bringing into focus the many elements that could have affected the use of electric vehicles.

People in India are beginning to think about protecting the environment as much as they can as environmental problems are becoming more prevalent. It is well known that gasoline and diesel. The majority of environmental harm is caused by transportation, which is why people are switching to electric automobiles. Even though the EV concept is already well established, few people are aware of it or have faith in it. They have doubts about the dependability and safety of electric automobiles. The purpose of this study is to examine how individuals perceive the advantages and disadvantages of electric vehicles and the technology they include. The only difference is that it uses more batteries than a gasoline-powered automobile. Electric cars are clearly needed in the modern world.

1.3 NEED AND SIGNIFICANCE OF STUDY

The study focuses on consumer perceptions of electric vehicles and future demand estimates. As a consequence, it would be feasible to do a statistical analysis of people's interest in electric automobiles. The study would also help in determining the viewpoints and experiences of different electric car users.

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1.4 OBJECTIVES OF STUDY

The main goal of this study was to determine how customers were affected by aspects including price, favourable environmental characteristics, financial benefits, references, and low noise levels.

Some of the main objectives are as follows:

1. To identify the major factors and obstacles preventing consumers from adopting EVs.
2. To study the impact of demographic features on consumer perception towards EV
3. To compare EV with Gasoline vehicles and Conventional motor vehicles in focus with performance
4. To identify the variables affecting the choice and use of electric vehicles.

1.5 SCOPE OF STUDY

As the EV industry grows year after year, there is greater opportunity for researchers to delve into the sector and learn more about its consumers. The researcher will have a wealth of market data from both the government and consumers. The future of e-vehicles is good and will be commonplace. This will allow researchers to access more primary and secondary data. The research results will be more accurate if the questionnaire is widened along with the respondents and an in-depth investigation is undertaken.

1.6 METHODOLOGY OF THE STUDY

The process of gathering facts and figures with the goal of doing research is known as methodology. The methodology may use a variety of instruments, such as the research purpose, sample, sampling techniques, etc. It is a vast field that includes the majority of research-related topics. It includes the available published literates such as books, journals, newspapers and relevant government websites. We` are planning to do the project research based on primary as well as secondary data.

1.6.1 DATA COLLECTION METHOD

Any research's most crucial phase is data collecting. There are often primary and secondary methods for gathering data. Data can be classified into two types: -

PRIMARY DATA

Primary data is the original data collected by researcher himself for a specific purpose. We can collect data through questionnaire on telephone

SECONDARY DATA

Secondary data is not original it is collected by somebody else for some other purpose. The source of data includes newspapers, company profiles etc. Hence, we have used both primary and secondary source of data.

1.6.2 SAMPLE SIZE

We have taken sample size of 78 respondents for our research.

1.6.3 TOOLS FOR DATA ANALYSIS

Graphs and ranking were utilised to filter information for accurate percentage analysis of the data, and charts were prepared for drawing inferences.

1) Mean

It is the sum of observation / number of observations.

2) Percentage Analysis

Percentage analysis is used to assess the data from the questionnaire. The outcomes are shown in percentages.

3) Ranking Method

Ranking of the data is also done accordingly. It is done by taking the percentage as base. And ranks are given to the results.

4) Graphs

Graphical representations are used to show the results in sample form. Graphs are prepared on the basis of the data that is received from percentage analysis. Graphs include pie chart and bar graphs

1.7 LIMITATIONS OF THE STUDY

- Response might not be precise.
- People will come to different conclusions
- People's willingness to respond may vary depending on their decisions.
- Less time for Study.

1.8 CHAPTERIZATION

CHAPTER 1

The first chapter deals with the introduction to the topic” A STUDY ON CONSUMER PERCEPTION ON ELECTRIC VEHICLE IN ERNKULAM DISTRICT” scope of the study, statement of the problem, objectives, Research methodology, limitations.

CHAPTER 2

The second chapter deals with the review of literature done by other researchers on consumer perception on electric vehicles.

CHAPTER 3

The third chapter deals with the theoretical framework, it deals with some general theories, functions, problems Etc. about on this topic

CHAPTER 4

The fourth chapter deals with the analysis and interpretation.

CHAPTER 5

The fifth chapter deals with findings and suggestions.

CHAPTER - 2
REVIEW OF LITERATURE

2. REVIEW OF LITERATURE

Literature reviews give you with a handy companion to a particular topic. However, literature reviews can give you an overview or act as a stepping gravestone, if you have limited time to conduct exploration. For scholars, the depth and breadth of the literature review emphasizes the credibility of the pen in his or her field. Literature reviews also give a solid background for an exploration paper's disquisition. Comprehensive knowledge of the literature of the field is essential to utmost exploration papers. In contrast to how an annotated bibliography would be structured, a literature review is often organised around concepts rather than the sources themselves. This indicates that you won't merely list your sources without providing a detailed analysis of each one separately. No. Instead, think about what themes or concerns tie your sources together as you read widely yet substantially in your field. These are a few of the literature reviews we've developed in relation to our subject matter.

1. Yogesh Aggarwal, (2019) In a demitasse, Indian Electric Vehicles Storm Yogesh Aggarwal, Vivek Gedda, and Kushan Parikh, scooter addicts who only require short-distance transport, may think about an EV; nevertheless, individuals who want longer-distance travel who previously owned motorcycles like a Hero Splendour may find it difficult to switch to an e2W. Increased battery size makes it relatively easy to expand the range for buses. For electric 2Ws, however, every additional kWh may result in a range extension of an additional 30 km, but the weight gain is only around 10 kg, or an increase of about 10 in the bike's overall weight. The weight problem is particularly noticeable in lower-powered bikes (those under 150cc)..

2. Janardan Prasad Kesari, (2019) By Janardan Prasad Kesari, Yash Sharma, Chahat Goel, "Electric Vehicle Opportunities and Scope in India," The government must overcome a number of obstacles to design an ambitious plan for the return of EVs in India and to prevent a well-executed crime. Problems arising from India's geography and variety would need careful consideration. The acquisition of four-wheeled government vehicles, three-wheeled vehicles, and automobiles for public transportation is predicted to be a significant driver of the rise of EVs. The first expansion of two- and four-wheeled electric cars is also expected to be boosted by investments made by line drivers similar to Ola and Uber and drivers of food distribution

services. Still, the private EVs may take five to six times longer to become fissile and acceptance.

3. Mr. A. Rakesh Kumar, (2019) Overview and Challenges of Indian Electric Vehicles by Dr. Sanjeevikumar Padmanaban, Mr. A. Rakesh Kumar Every effort performed to reduce CO2 emigrations and conserve the world is necessary since global pollution is on the rise. The preamble of EVs is one issue that is comparable. Since the transportation industry is one of the biggest emitters of CO2, it's crucial to cut back. The government has developed ambitious plans to introduce EVs to the Indian market and keep up with the global development of EVs. An extensive study on EVs is part of the National Electric Mobility Mission Plan 2020. India faces a significant difficulty in switching from ICE to EV vehicles in the transportation industry. Along with extensive planning, this requires R&D. Range anxiety must be effectively handled by the charging system. It's critical to create demand by electrifying all government vehicles and providing duty exemption to certain EV owners.

4. Enough Bhalla, (2018) A Study of Consumer Perception and Purchase Intention of Electric Vehicles Enough Bhalla, Inass Salamah Ali, Afroze Nazneen, Choice of buses depends upon environmental concern, cost, comfort, trust, technology, social acceptance, structure vacuity. These arguments have been tested for both conventional buses and EVs. They assume that these factors have direct influence on individual choice of vehicle. They set up that EV manufacturers and Government have to invest more in social acceptance of the vehicle by creating further infrastructural installations, putting further thrust on technology to produce trust. The analysis depicts that the population is well apprehensive of the environmental benefits. The responsibility lies on the shoulders of the Government and manufacturers to investing in the manufacturing of vehicles.

5. Masurali.A, (2018) The way implicit passengers see and respond to electric buses Masurali. In terms of carbon emigration, India makes up around 18 percent of the global total, according to Surya P. One of the most practical and necessary solutions to beat heads is the electric vehicle (EV). Several automakers are extending their product lines and launching EVs. Promoting EVs may assist the country and its citizens by lowering energy use and pollution. People's awareness of EVs has grown greatly as a result of their education. Government should

make a concerted effort to promote awareness and change implicit visitors' perceptions, which are often fragmented from producers.

6.PritamK. Gujarathi, (2018) Market research on electric vehicles in India, including consumer perspectives, initiatives, and problems Varsha A. Shah, Makarand M. Lokhande, Pritam K. Gujarati Indian script is unique due to the present EV/PHEV request share of about 0.01. Currently, almost all vehicles consider fossil fuels to be the foundation of mobility. These contribute to global warming by releasing hothouse gases into the sky. Domestic petroleum production and consumption are falling behind each other. Around 70 oil paintings are needed annually in India. Therefore, it is imperative to investigate the drivers of sustainable and cleaner development.

7.Mohamed M, (2018) The replacement of ICE with electric machines will greatly reduce pollution and benefit buyers, according to a study on the opportunities and challenges for electric vehicles in India by Mohamed M, G Tamil Arasan, and G Sivakumar. This technology has been used by various nations, which is improving the landscape. The experimenter observed the opportunities and difficulties associated with enforcing EVs in India. positions in the government, battery packs, careful planning, and surroundings have all been taken into consideration. With these difficulties, factors including the price of EVs, how effective EVs are in India, and EV demand were taken into account. India's usage of EVs is largely intended to reduce oil painting costs and stem hothouse emigration. The government should make the most of all possibilities that are present and come up with successful remedies for the problems.

8.Vijayagopal (2018) This study created an integrated model for the possible factors that influence consumer attitude towards electric vehicles based on the hypothesised influences of a particular presumption of EV owners that may be held by people without experience with EVs and the latter's self-image congruence regarding EV ownership. Both product user SIC and stereotype negativity have been postulated as factors that affect both SIC for users of products and positivity for stereotypes, as well as having an immediate effect on consumer attitude. Investigations were conducted on the linkages between the factors as well as the association between attitude and readiness to buy. The model was calculated both before and after research subjects engaged in a game in which they played the role of an electric car driver

9. Lingzhi Jin, (2017) International Council on Clean Transportation Lingzhi Jin, Peter Slowik, the early request growth for electric vehicles continues, but a number of walls help their wide uptake. These walls include the fresh cost of the new technology, relative vexation of technology considering range and charge times, and consumer understanding about the vacuity and viability of the technology. This last point, generally appertained to as “consumer mindfulness,” is pivotal.

10. Fanchao Liao, (2017) The widespread abandonment of EVs, as suggested by Fanchao Liao, Eric Molin, and Bert van Wee, may help to mitigate issues including environmental pollution, global warming, and the dependency on oil-based painting. Although governments are mandating robust creation programmes, the penetration of EV is still fairly low. In order to inform policy-makers and provide guidance for more research, they offered a thorough assessment of studies on consumer preferences for EV. The economic and intellectual approaches to customer desire for electric vehicles were contrasted. The cost for both purchase and operation, driving range, charging time, vehicle performance, and brand variety are just a few examples of the financial and specialised characteristics of EVs that have a big influence on their mileage. The viscosity of charging stations has a significant impact on EV production and mileage. Programmes that encourage incitement have a somewhat effective influence on duty reduction.

11. Philippe Lebeau, (2015) Conventional, mongrel, or Electric Vehicles Which Technology for a Civic Distribution Centre? by Philippe Lebeau, Cedric De Cauwer, Joeri Van Mierlo, Cathy Macharis, Freight transport has a major impact on civic movement. Experimententer explored the possible integration of electric vehicles in civic logistics operations. A line with different technologies has the occasion of reducing the costs of the last afar. Experimententer presented a line size and blend vehicle routing problem with time windows for EVs. The main donation of the authors was considering the variability of the range of EVs. In the parts of small vans, EVs are frequently the most competitive technology. In the member of large vans, diesel has seen the most intriguing result from a fiscal point of view as electric vehicles would need to cover a longer distance to be cost- competitive. mongrel vehicles are chosen in the member of exchanges as its handling costs and fixed costs are lower than the diesel truck.

12. Bodin (2015) Advances in consumer electric vehicle adoption: by Rezvani, Jansson, and Bodin, 2015 They provide an overview of EV adoption research, but they only focus on individual specific psychological aspects that influence people's desire to embrace electric vehicles, and they only choose a few typical studies. Our evaluation adds to it in two ways: first, we include more aspects than simply psychological ones that impact the adoption of electric cars, and second, we combine all academic studies on electric vehicle preferences that are publicly available to provide a complete picture of the state of the field.

13. Gusto P.K., (2013) By Praveen Kumar and Kalyan Gusto, Implied Necessity for Electric Vehicles, Charging Point Structure, and its Limitations for the Indian Market India might invest in small-scale solutions to address the local freight challenges rather than making a radical change. Home charging needs to be promoted. Before imposing the large-scale charge structure, proper planning of the area, population, business viscosity, and safety should be taken into account. It's critical to include conditioning into the energy and transport domains. Growth aspirations through many new programmes and initiatives, for example, providing drivers of electricity buses with financial consumer encouragements like duty credits, purchase subsidies, blinkered sacrifices, free parking, and access to designated turn lanes, would aid in the demand's growth.

14. Marcello Contestabile, (2012) Electric Vehicles A conflation of the Current Literature with a Focus on profitable and Environmental Viability Marcello Contestabile, Dr Gregory Offer, Dr Robin North, an exploration concludes that the longer- term uptake of EVs will depend heavily on progress in battery technology, to bring down costs and increase energy viscosity, and on the provision of a suitable recharging structure.

15. M Pierre (2011) M Pierre (2011) Similar incidents have occurred in the recent decades-long albeit more modest but full of learning: in the 1990s, some people chose electric vehicles for their daily commuting, and some local governments backed developments based on them. By presenting research between 2006 and 2008, we want to understand the reasons for this unusual modal choice, emphasise the challenges experienced by electric car users at the time, and assess the usage patterns that shaped their mobility and use of electric vehicles

16.Hoyer (2008) Electric car technology has been around for over a century. In contrast, the availability and practicality of combustion engines has delayed the adoption of electric driving. The interest in electric cars is now being rekindled by a number of (pushing and pulling) factors. On the one hand, a limited supply of oil and growing awareness of the environmental impact of traditional combustion engine vehicles push people toward cleaner electric vehicles. Recent improvements in battery technology and electric motors have made the electric vehicle a competitive alternative to conventional cars in terms of pulling power.

After reviewing the literature on consumer perception towards electric vehicles, it can be concluded that there are various factors that influence consumer attitudes and behaviour towards electric vehicles. One of the most important factors is the perceived benefits of electric vehicles, which include environmental sustainability, cost savings on fuel and maintenance, and performance advantages. However, there are also perceived drawbacks, such as limited driving range and concerns about charging infrastructure. Other important factors include demographic characteristics such as age, income, and education level, as well as social norms, cultural values, and government policies. Consumer knowledge and awareness about electric vehicles also play a significant role in shaping attitudes and behaviours. Overall, the literature suggests that while there is growing interest and acceptance of electric vehicles, there are still barriers to widespread adoption. Addressing these barriers will require a multi-faceted approach that involves education, infrastructure development, and policy incentives.

CHAPTER - 3
THEORETICAL FRAMEWORK

3. THEORETICAL FRAMEWORK

3.1 ELECTRIC VEHICLES

A vehicle that employs one or further electric motors for propulsion is appertained to as an electric vehicle (EV). It may be driven singly by a battery, a collector system, or electricity from extravehicular sources (occasionally charged by solar panels, or by converting energy to electricity using energy cells or a creator). Electric vehicles (EVs) include, but aren't limited to, face and aquatic craft, electric planes, and electric spaceships. EVs for road buses are part of a unborn mobility conception known as Linked, Autonomous, Shared and Electric (CASE) Mobility, which also includes other forthcoming automotive technologies including participated mobility, independent driving, and connected vehicles.

3.1.1 History

A stator, rotor, and commutator were employed in the first rudimentary but functional electric motor developed by Hungarian clerk Nyos Jedlik in 1827. The coming time, he used it to power atomic machine. Professor Sibrandus Stratingh of the University of Groningen in the Netherlands constructed a atomic electric vehicle in 1835, and between 1832 and 1839, Robert Anderson of Scotland created the first primitive electric carriage that used primary cells that weren't rechargeable. In 1835, American blacksmith and innovator Thomas Davenport created atomic electric locomotive that was propelled by a crude electric motor. Robert Davidson, a Scotsman, created an electric locomotive in 1838 that could go at four long hauls per hour (6 km/ h). A patent for using rails as electric current operators was awarded in England in 1840, while Lilley and Colten entered similar patents in the United States in 1847.

In the early 1900s, mass- produced electric buses first arrived in America. Although it also joined the request for gasoline buses in 1904, the Studebaker Automobile Company entered the machine assiduity in 1902 with electric vehicles. still, the fissionability of electric motorcars mainly dropped with the preface of low- cost assembly- line vehicles by Ford Motor Company.

3.1.2 TYPES OF ELECTRIC VEHICLES

1. Hybrid Electric Vehicles (HEV)
2. Plug-in hybrid Electric Vehicles (PHEV)
3. Battery Electric Vehicles (BEV)
4. Fuel Cell Electric Vehicle (FCEV)

Hybrid Electric Vehicles

A hybrid vehicle that combines a fully electric system with a traditional internal combustion engine (ICE) system is known as a hybrid electric vehicle (HEV) (hybrid vehicle drivetrain). The electric powertrain's presence aims to either produce higher performance or better fuel efficiency than a traditional car.

Plug-in hybrid Electric Vehicles

A plug-in hybrid electric vehicle (PHEV) is a hybrid electric vehicle with a battery pack that can be recharged both internally by the on-board internal combustion engine-powered generator and externally by connecting a charging cable into an external electric power source.

Battery Electric Vehicles

Electric vehicles (EVs) that only rely on chemical energy stored in rechargeable battery packs as their only source of propulsion are known as battery electric vehicles (BEVs), pure electric vehicles, only-electric vehicles, completely electric vehicles, or all-electric vehicles (a hydrogen fuel cell, internal combustion engine, etc.).

Fuel Cell Electric Vehicle

An electric vehicle that uses a fuel cell to power its onboard electric motor, sometimes in conjunction with a small battery or supercapacitor, is known as a fuel cell vehicle (FCV) or fuel cell electric vehicle (FCEV). Fuel cells in automobiles generally use compressed hydrogen and oxygen from the air to produce energy. Since fuel cells only emit heat and water, the vast majority of them fall under the category of zero-emission automobiles. Since hydrogen is often produced from natural gas that has undergone reformation, hydrogen-powered vehicles concentrate pollutants there as opposed to internal combustion vehicles.

3.1.3 EXAMPLES OF ELECTRIC VEHICLES

1.Ola

2.Ather

3.Okinawa Autotech

4.Revolt

Ola Electric

Ola Electric Mobility is a Bengaluru-based producer of electric two-wheelers in India. Its production facility is at Krishnagiri, Tamil Nadu, India.

Ather

Ather Energy is an Indian electric vehicle company, headquartered in Bangalore. It was founded by Tarun Mehta and Swapnil Jain in 2013. It manufactures two electric scooters - the Ather 450X and the Ather 450 Plus. It has also established electric vehicle charging infrastructure across the country called Ather Grid.

Okinawa Autotech

Okinawa Autotech is an Indian company that produces electric scooters. The company was founded by Jeetender Sharma and Dr Rupali Sharma, and has its headquarters in Gurgaon.

Revolt

Founded by Rahul Sharma, who also co-founded Micromax mobile phones, Revolt Intellicorp has been set-up with an investment of around Rs. 400-500 crore and will commence operations with an electric and artificial intelligence motorcycle.

3.1.4 ADVANTAGES OF ELECTRIC VEHICLES

1.No Fuel Emission

2.Running Costs

3.Low Maintenance

4.Performance

5.Popularity

No Fuel Emission

This is the major selling factor for electric vehicles. An EV is the best option if you wish to lessen your own transportation-related environmental impact. An electric vehicle (EV) does not produce any of the gases frequently linked to global warming since the electric engine in an EV runs on a closed circuit. A completely electric vehicle has no need for gasoline or fuel, which is wonderful for reducing your carbon impact.

Running Costs

With electric vehicles, you may also significantly reduce your fuel costs because you won't need to buy gasoline or diesel to keep your vehicle running. In the UK, filling a medium-sized car's tank with unleaded gas may cost more than £100 at the time of writing. Comparatively, completely charging your electric car at home might cost as much as £15.10, depending on the model you drive and the plan you have.

Low Maintenance

Everybody is aware that automobiles occasionally require some TLC. Electric cars don't require expensive engine maintenance, but gasoline and diesel engines do throughout the course of their lifespan. A typical combustion engine contains hundreds of moving components that might malfunction, but an electric motor only has around 20. As a result, compared to conventional cars, your EV is probably going to require less frequent maintenance.

Performance

The majority of the enjoyment in having a car comes from using it on the roads. Electric vehicles haven't always had the most svelte appearance, and many people have had low expectations for how well they can perform in comparison to conventional engines. The performance of EVs has skyrocketed as more manufacturers have flooded the market with their own versions of the technology. As all of their power is generated from a standing start, electric automobiles are lightweight and have a surprising amount of acceleration power.

Popularity

Knowing that electric vehicles are getting more and more common can be a drawback for you if you prefer to stand apart from the crowd, but for many people, it's a tremendous plus. The enabling infrastructure will increase as more EVs circulate on our roadways. This figure is anticipated to continue to decline as more electric vehicles enter the road, while the number of charging stations will likely continue to rise.

3.1.5 DISADVANTAGES OF ELECTRIC VEHICLES

1. Driving Range

2. Recharge Time

3. Battery Life

Driving Range

For those who have read up on electric automobiles, the phrase "range anxiety" is well-known. The present generation of EVs can't drive as far as a fossil-fuelled vehicle can, but the range of a single charge has increased significantly in recent years and is still growing. Today's most popular electric vehicles can go more than 100 miles on a single charge. Due to the fact that a combustion engine and an electric motor operate together in a hybrid electric car, range anxiety may be significantly reduced.

However, most trips made in a car are less than 30 miles, which most EVs are able to do without issue. Similarly, the way that you fuel the car requires a different mentality to a fossil fuelled engine. Rather than filling up infrequently, you simply charge the car regularly – similar to your mobile phone

Recharge Time

It takes exactly five minutes to pull into the motorway service station when your fuel gauge begins to flash at you, fill up, and then resume driving. We are all accustomed to this practical procedure.

Electric car charging does require more time. A leisurely overnight charge at home, which is sufficient for the majority of uses, is thought to account for 80% of EV charging. Additionally, many companies now provide electric vehicle charging stations in their employee parking lots, as do we at Good Energy.

Battery Life

An electric car cannot function without a battery; you cannot drive anywhere without one! Nevertheless, the batteries now used in EVs in the UK have a finite lifespan and will require replacement every 10 to 20 years, depending on the brand and model. When contemplating buying an electric car, it's important to factor in battery replacement as a longer-term expense.

3.2 Factors Influencing Customer Perception

1. Individual experience

Customer experience with a particular product throughout its purchase and use has a significant impact on how customers perceive that product. If the quality, customer service, value, logo, colour, limitations, and other factors had the potential to forge a strong connection with the customers' psyches, they would be able to form a positive opinion of the brand. However, if consumers did not appreciate the participation in the brand, it will create a lasting impression.

2. Promoting Clients

Through promotions, customers get the opportunity to view the products first, and as a result, they are likely the most important element influencing customer impression. An organization's campaigns and public relations efforts can help it gain the trust of its target audience.

3. Influencers

Most of the time, people buy products after they have been tried and tested by someone else. Influencers are those who have used the product and obtained it first. When others learn about the fantastic product that the influencer has tested, they are more likely to buy it and give it a try because the recommendation came from a reputable source.

4. Client audits

Before making a purchase, many people research customer feedback. This illustrates the importance of client audits in defining client perception. If customers see that a product has fewer stars, it is likely that the product has received poor customer reviews. It has a negative psychological impact on the customer.

5. Web-based life

The most reliable tool for managing customer impression is now online life. When the online community receives trustworthy information about a product, the customers form an opinion on it. It is possible to submit articles, photographs, and videos on the internet, which helps to create the idea that the organisation wants.

3.3 COMPARISON BETWEEN ELECTRIC VEHICLES AND I.C. ENGINE VEHICLES

Features	Electric Vehicles	I.C. Engine
Prime Mover	Electric Motor	I.C. engine
Powered By	Charged battery, ultra-capacitors	Diesel, Petrol
Self-weight	High due to battery bank	Low as compared to EV
Power Transmission	Both mechanical as well as electrical	Mechanical only
Braking system	Regenerative braking	Friction braking
Efficiency	High	Low
Eco friendly	Yes	No
Initial cost	High	Average
Running cost	Low	Very high

3.4 PROPERTIES

Components

According to the size, power, and proposed use, which can range from small motorised wheelchairs and shopping carts to peddles, electric motorcycles and scooters, neighbourhood electric vehicles, industrial forklift trucks, and many hybrid vehicles, different types of batteries, traction motors, and motor controller designs are used.

Energy sources

Compared to fossil fuel cars, EVs are far more efficient and emit far less direct emissions. They do, however, rely on electrical energy, which is often produced by a mix of fossil fuel and non-fossil fuel plants. Consequently, by changing the electrical source, EVs may be made to be less polluting overall. People can urge utilities in some places to get their electricity from renewable sources.

Batteries

In addition to the traction battery specialty systems used for commercial (or leisure) vehicles, an electric-vehicle battery (EVB) powers the propulsion system of a battery-powered vehicle (BEVs). These batteries are often secondary rechargeable batteries made on lithium-ion technology. Forklifts, riding floor scrubbers, electric motorbikes, electric automobiles, lorries, vans, and other electric vehicles all need traction batteries, which are particularly made with a high ampere-hour capacity.

Efficiency

EVs convert over 59–62% of grid energy to the wheels. Conventional gasoline vehicles convert around 17–21%.

Charging capacity

Grid The worldwide demand for power may grow by up to 25% by 2050 compared to 2020 if practically all road cars were electric.

Charging stations

A charging station, often called a charge point or an EVSE, is a piece of equipment that provides electrical power for plug-in electric vehicle charging (including electric cars, electric trucks, electric buses, neighbourhood electric vehicles, and plug-in hybrids).

Battery swapping

Batteries for EVs might be manually replaced at specialised stations in a matter of minutes rather than charging them from electrical plugs.

Dynamic charging

For dynamic charging, or charging a vehicle while it is moving, TRL (previously Transport Research Laboratory) provides three power supply methods: overhead power lines, ground level electricity via rail, and induction.

Safety

In order to ensure that vehicles with a high voltage electric power train, such as hybrid and fully-electric vehicles, are as safe as combustion-powered vehicles, the United Nations in Geneva (UNECE) has adopted the first international regulation (Regulation 100) on safety of both fully electric and hybrid electric vehicles.

Environmental

EVs don't emit any tailpipe air emissions, but the power used to charge them may have negative effects on human health and the environment.

Production and operation of an EV often result in lower carbon emissions than those of a conventional vehicle. Compared to internal combustion cars, EVs virtually usually emit less pollution in metropolitan areas.

Socio-economic

According to a 2003 study conducted in the UK, "those communities that are most polluted and which also emit the least pollution tend to be among the poorest in Britain," and "pollution is

most concentrated in areas where young children and their parents are more likely to live and least concentrated in areas to which the elderly tend to migrate."

Energy efficiency

Compared to internal combustion engine cars, EVs are approximately three times more efficient from tank to wheels. Unlike internal combustion engines, which burn fuel when idling, a moving vehicle does not use energy while stationary

Total cost

In areas of the globe where fossil fuels are subsidized, lifespan costs of diesel or gas-powered vehicles are occasionally less than a similar EV as of 2021. However, the total cost of ownership of an EV varies greatly based on region and distance travelled annually.

Heating of EVs

It takes a lot of energy to heat a car's interior and defrost its windows in chilly locations. This heat is already present in internal combustion engines as waste combustion heat that has been diverted from the cooling system.

CHAPTER - 4
DATA ANALYSIS AND INTERPRETATION

DATA ANALYSIS AND INTERPRETATION

To complete the study properly, it is necessary to analyse the data collected to test the hypothesis and answer the research questions. Descriptive analysis is used to interpret the data. The findings from this study are analysed, presented, and interpreted in this chapter. Data analysis and interpretation are done in two different ways. A quantitative analysis of the data is covered in the first section, which is based on the questionnaire's results. The second is a qualitative interpretation that is based on the findings of the focus group and interview. A systematic presentation, analysis, description, and interpretation of the research data from the quantitative and qualitative studies is made.

In this chapter, an analysis is made by the researcher to analyse “A STUDY ON CONSUMER PERCEPTION TOWARDS ELECTRIC VEHICLES IN ERNAKULAM DISTRICT”. The data required for the study was collected from respondents through questionnaires. The total number of samples was 80 respondents. Various statistical tools are required to analyse the collected primary data. Thus, the information required through the questionnaire is analysed and presented in the form of charts and tables.

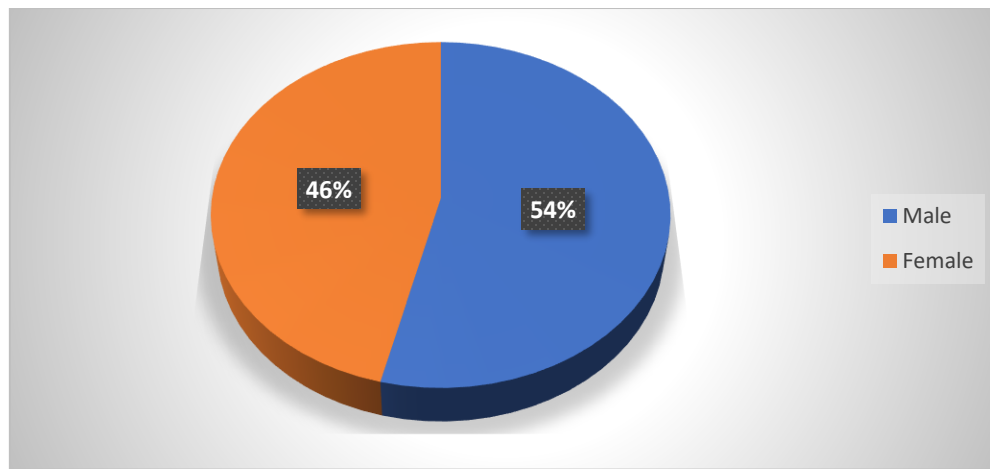
4.1 GENDER WISE CLASSIFICATION

TABLE 4.1

Gender	Frequency	Percentage
Male	42	55
Female	36	45
Total	78	100

Source: Primary data

FIGURE 4.1



INTERPRETATION:

This chart shows the gender of the respondents. From the table above it is clear that majority of the respondents are Male (55%) and the remaining 45% of the respondents are Female.

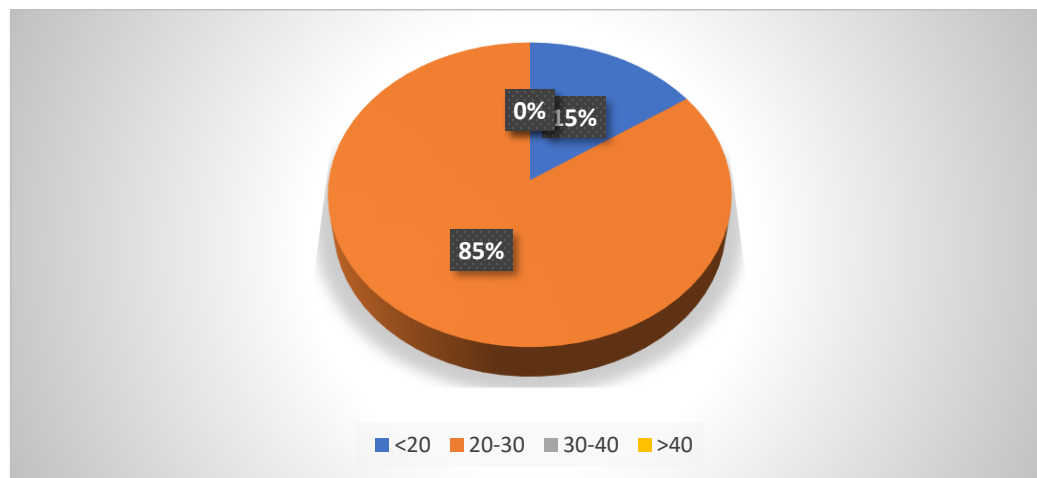
4.2 AGE WISE CLASSIFICATION

TABLE 4.2

Age	Frequency	Percentage
<20	12	15
20-30	66	85
30-40	0	0
>40	0	0
Total	78	100

Source: Primary data

FIGURE 4.2



INTERPRETATION:

This chart shows the age of the respondents. From the table above it is clear that majority of the respondents are from the age group of 20-30 years (85%) and 15% of the respondents are belongs to the age group of under 20 years.

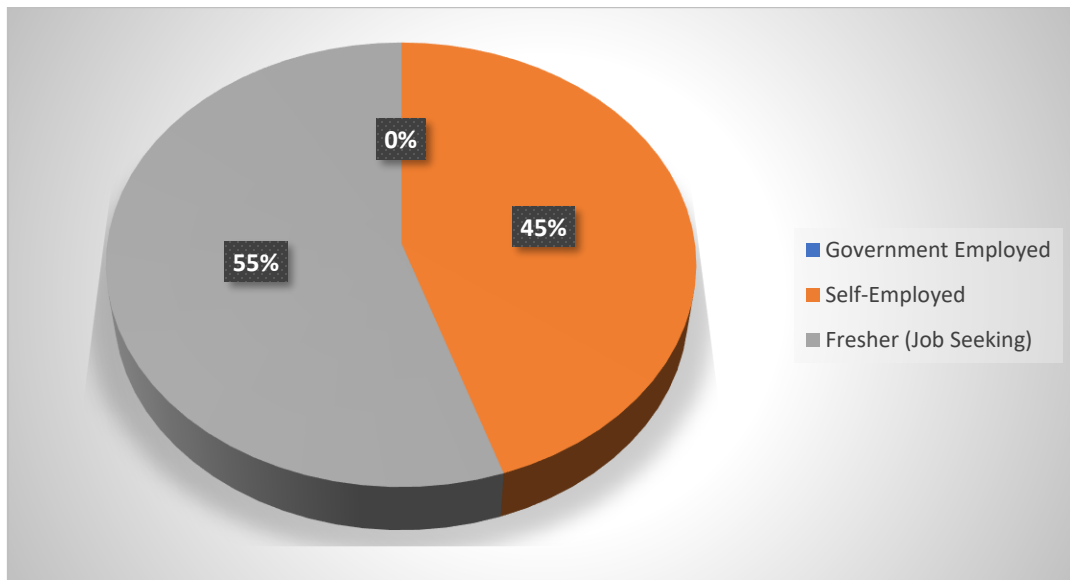
4.3 PROFESSION WISE CLASSIFICATION

TABLE 4.3

Profession	Frequency	Percentage
Government Employed	0	0
Self-Employed	35	45
Fresher (Job Seeking)	43	55
Total	78	100

Source: Primary data

FIGURE 4.3



INTERPRETATION:

This chart shows the profession of the respondents. From the table above it is clear that majority of the respondents are Freshers (55%) and the remaining 45% are the respondents are self-employed.

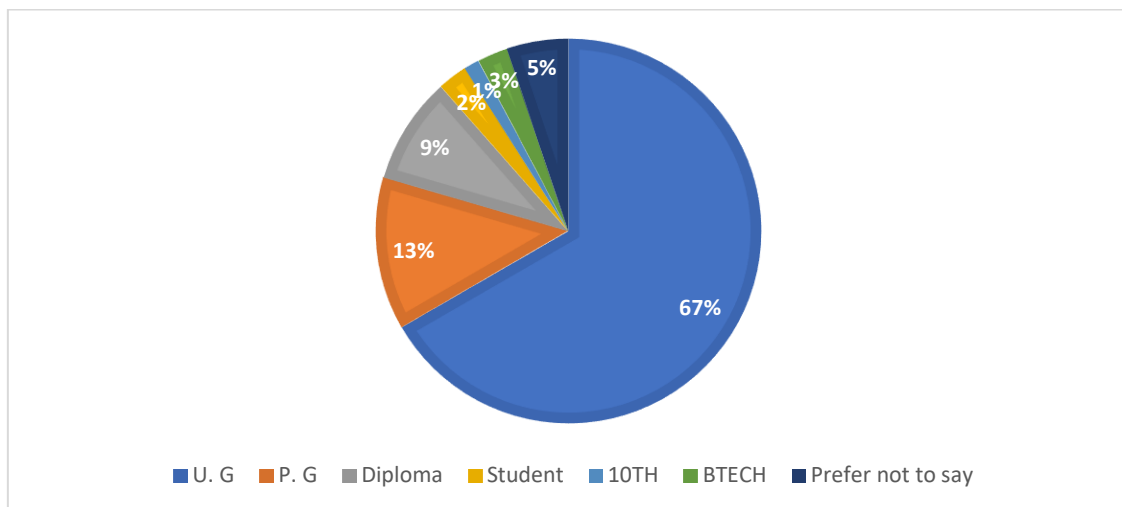
4.4 EDUCATION QUALIFICATION WISE CLASSIFICATION

TABLE 4.4

Education Qualification	Frequency	Percentage
U. G	52	66.7
P. G	10	12.8
Diploma	7	9
Student	2	2.6
10 TH	1	1.3
BTECH	2	2.6
Prefer not to say	4	5.1
Total	78	100

Source: Primary data

FIGURE 4.4



INTERPRETATION:

This chart shows the education qualification of the respondents. From the table above it is clear that majority of the respondents are Under graduates that is 67%. 13% of the respondents belongs to Post Graduates. 9% of the respondents are diploma and the remaining are students.

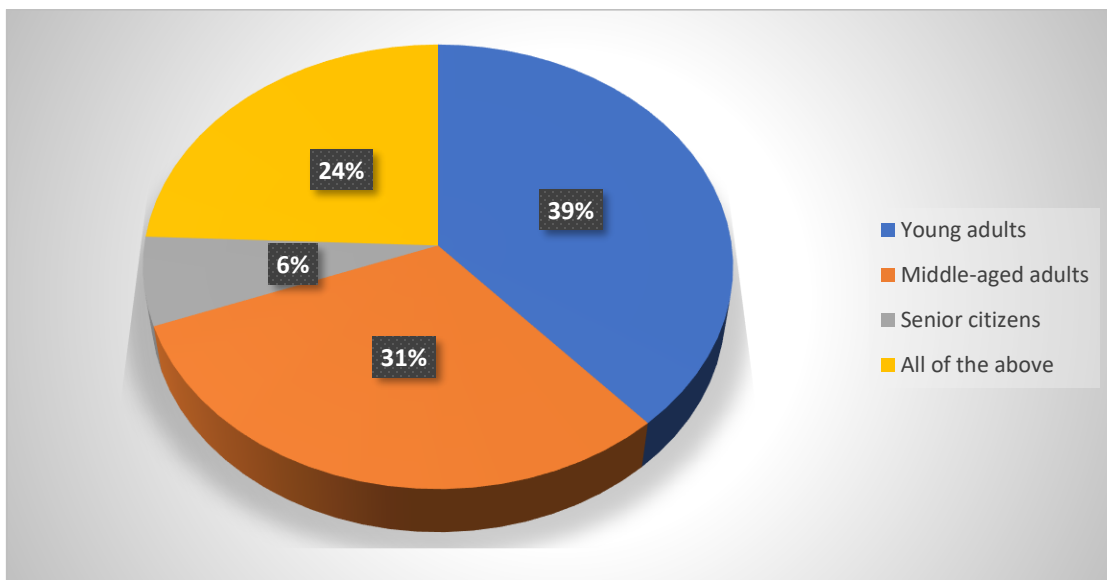
4.5 DEMOGRAPHIC SHOW INTEREST IN PURCHASING AN ELECTRIC VEHICLE

TABLE 4.5

Options	Frequency	Percentage
Young adults	30	38.5
Middle-aged adults	24	30.8
Senior citizens	5	6.4
All of the above	19	24.4
Total	78	100

Source: Primary data

FIGURE 4.5



INTERPRETATION:

From the table above it is clear that majority of the respondents is interested purchasing electric vehicles that is Youth adults are interested in purchasing electric vehicles (39%). Then 31% of the middle-aged adults are prefer to purchase electric vehicles and then so on.

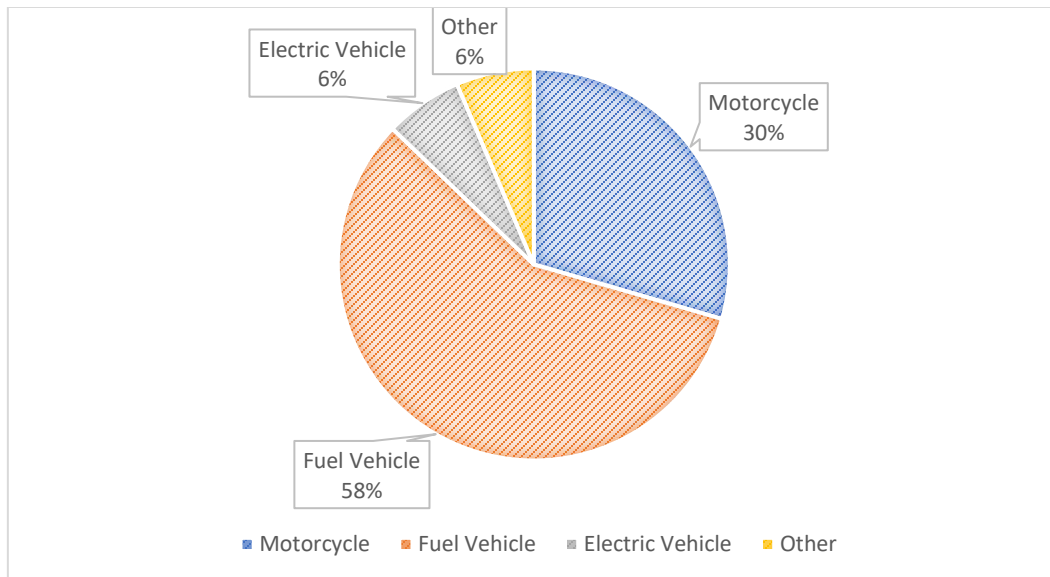
4.6 CURRENT MODE OF TRANSPORTATION

TABLE 4.6

Options	Frequency	Percentage
Motorcycle	23	29.5
Fuel Vehicle	45	57.7
Electric Vehicle	5	6.4
Other	5	6.4
Total	78	100

Source: Primary data

FIGURE 4.6



INTERPRETATION:

From the table above it is clear that majority of the transportation mode is Fuel Vehicles (58%) and the Motorcycle is 30%, then 14% of the respondents equally prefers electric vehicles and others.

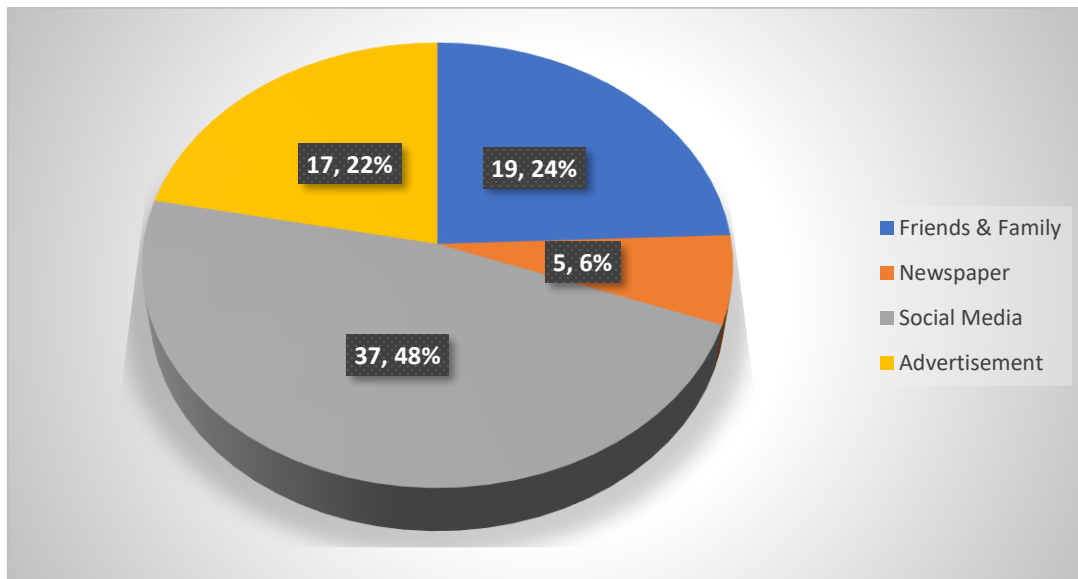
4.7 HEARD ABOUT ELECTRIC VEHICLES

TABLE 4.7

Options	Frequency	Percentage
Friends & Family	19	24.4
Newspaper	5	6.4
Social Media	37	47.4
Advertisement	17	21.8
Total	78	100

Source: Primary data

FIGURE 4.7



INTERPRETATION:

From the table above it is clear that majority of the respondents heard about the electric vehicles from the social media (48%). 24% of the respondents heard about the electric vehicles from friends and family. Then the remaining 22% of the respondents heard from advertisement and 6% heard from newspaper.

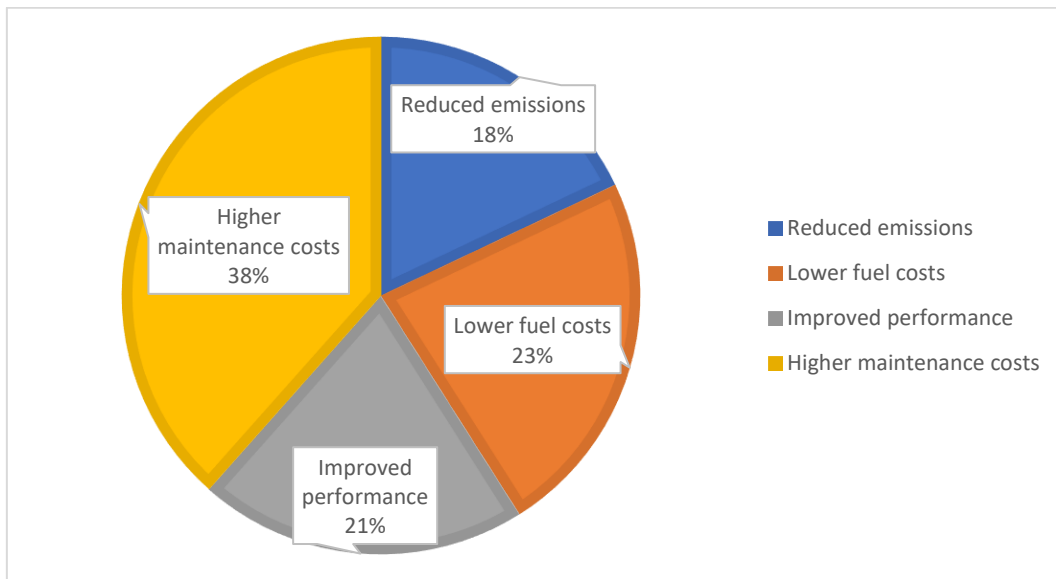
4.8 NOT A BENEFIT OF ELECTRIC VEHICLES

TABLE 4.8

Options	Frequency	Percentage
Reduced emissions	14	17.9
Lower fuel costs	18	23.1
Improved performance	16	20.5
Higher maintenance costs	30	38.5
Total	78	100

Source: Primary data

FIGURE 4.8



INTERPRETATION:

From the table above it is clear that majority of the respondents choose that higher maintenance cost (38%) then 23% of the respondents prefer lower fuel cost. Then the 20% of the respondents prefer improves performance. Then the Remaining 19% of the respondents are preferred Reduced emission

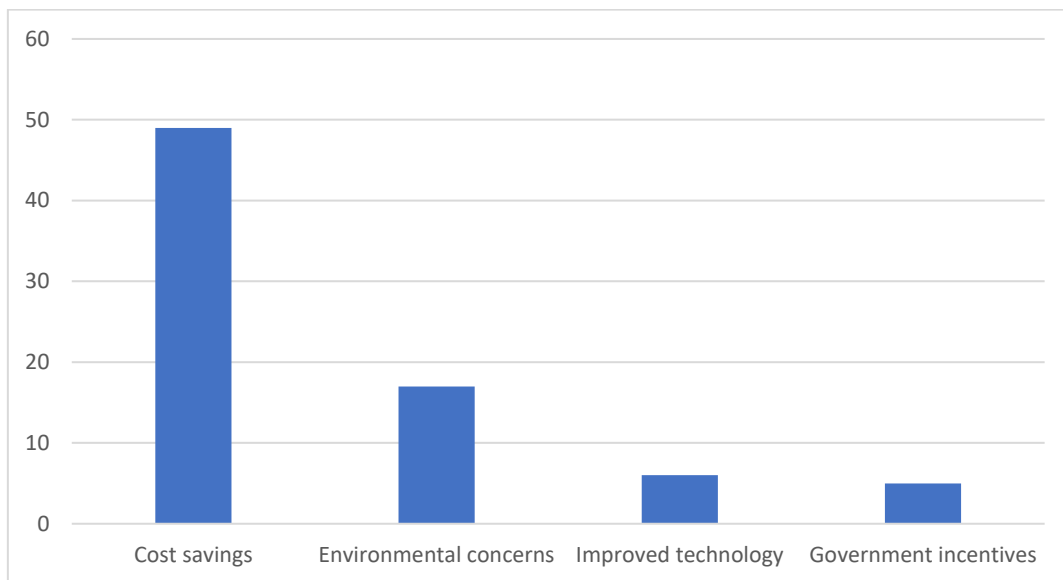
4.9 CAUSE CONSUMERS TO SWITCH FROM A GAS-POWERED VEHICLE TO AN ELECTRIC ONE

TABLE 4.9

Options	Frequency	Percentage
Cost savings	49	63.6
Environmental concerns	17	22.1
Improved technology	6	7.8
Government incentives	5	6.5
Total	77	100

Source: Primary data

FIGURE 4.9



INTERPRETATION:

From the table above it is clear that most of the respondents choose that electric vehicles are cost saving (64%). 22% of the respondents prefer environmental concern. Then the improved technology and government incentives are preferred by the 7% and 8% by the respondents.

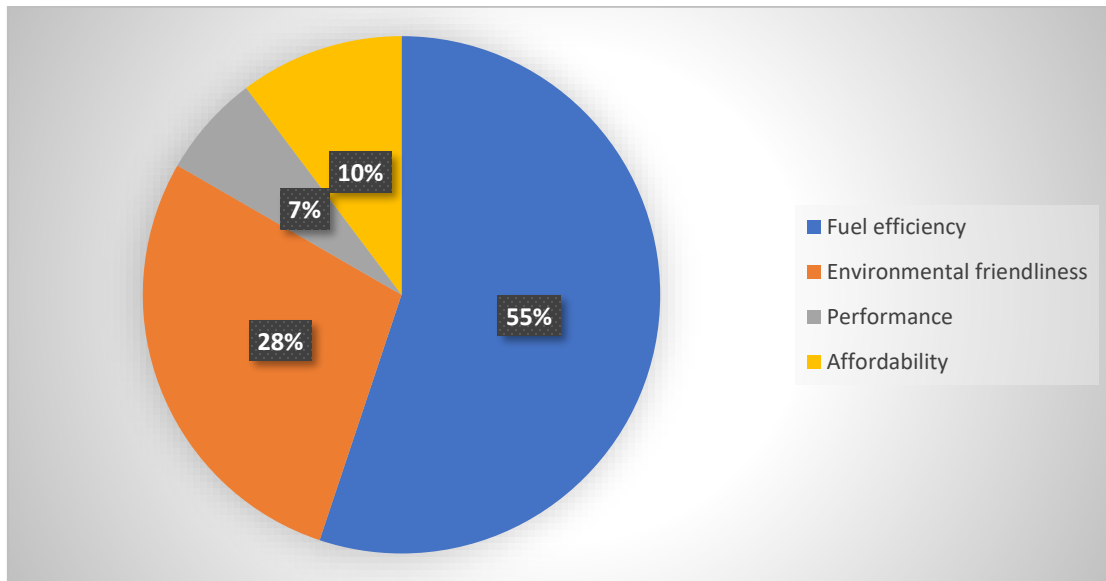
4.10 BENEFIT THAT CONSUMERS ASSOCIATE WITH ELECTRIC VEHICLES AND MOTORCYCLES

TABLE 4.10

Options	Frequency	Percentage
Fuel efficiency	43	55.1
Environmental friendliness	22	28.2
Performance	5	6.4
Affordability	8	10.3
Total	78	100

Source: Primary data

FIGURE 4.10



INTERPRETATION:

From the table above it is clear that most of the respondents prefer Fuel efficiency (55%) then the 28% of the respondents prefer environmentally friendly. Then the 10% and 7% of the respondents chooses performance and affordability.

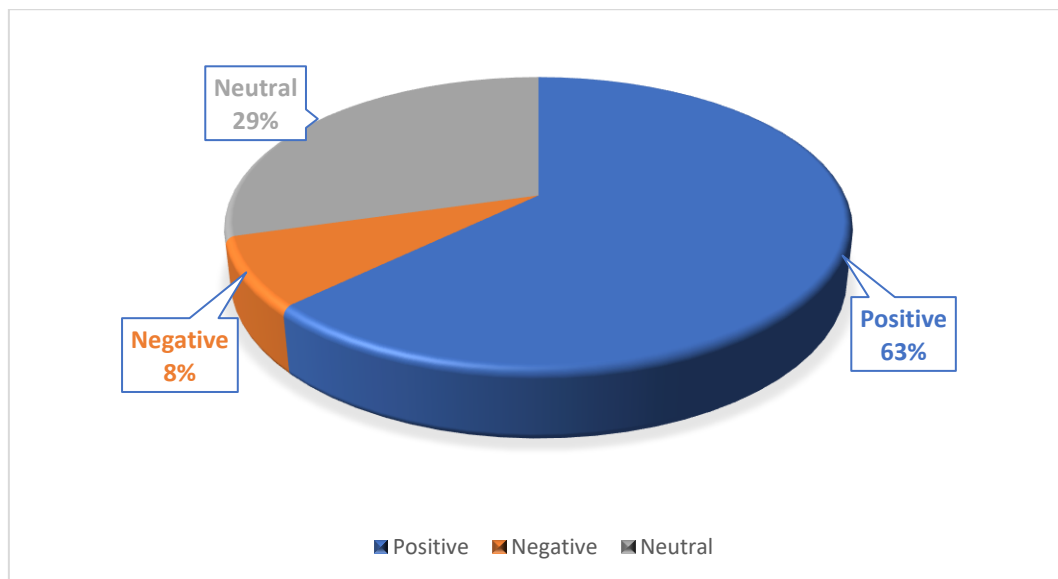
4.11 ATTITUDE DO YOU HAVE TOWARDS ELECTRIC VEHICLES

TABLE 4.11

Options	Frequency	Percentage
Positive	49	62.8
Negative	6	7.7
Neutral	23	29.5
Total	78	100

Source: Primary data

FIGURE 4.11



INTERPRETATION:

From the table above it is clear that most of the respondents selected that a positive attitude towards electric vehicles (63%) and 30% of the respondents are in neutral. The remaining 8% of the respondents are in negative attitude towards electric vehicles.

4.12 GOVERNMENT'S POLICY ON ELECTRIC VEHICLES

TABLE 4.12

Options	Frequency	Percentage
Positive policies such as subsidies and tax credits increase consumer perception	38	48.7
Negative policies such as high taxes decrease consumer perception	8	10.3
Government policy has no impact on consumer perception	16	20.5
Consumers are unsure about the impact of government policy	16	20.5
Total	78	100

Source: Primary data

TABLE 4.12.1

Options	Frequency	Mean	Rank
Positive policies such as subsidies and tax credits increase consumer perception	38	0.49	1
Negative policies such as high taxes decrease consumer perception	8	0.10	3
Government policy has no impact on consumer perception	16	0.21	2
Consumers are unsure about the impact of government policy	16	.021	2
Total	78		

INTERPRETATION:

From the table above it is clear that most of the respondents prefers the positive policies such as subsidies and tax credit. So, we rank this as 1. 16 respondents for government policy have no impact and 16 for consumer are unsure about the impact so both are ranked as 2.

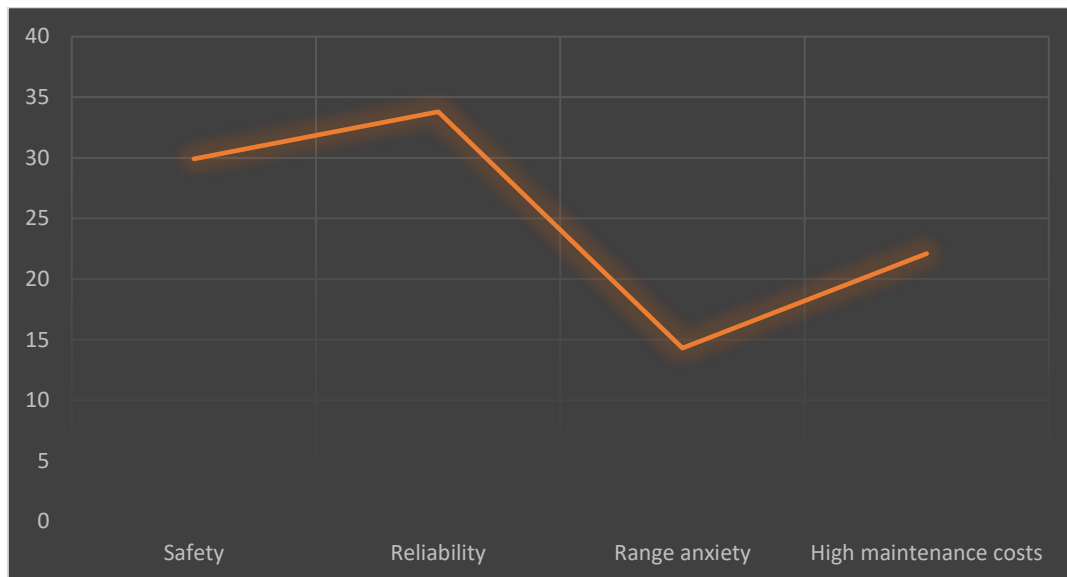
4.13 COMMON CONCERN AMONG CONSUMERS ABOUT ELECTRIC VEHICLES AND MOTORCYCLES

TABLE 4.13

Options	Frequency	Percentage
Safety	23	29.9
Reliability	26	33.8
Range anxiety	11	14.3
High maintenance costs	17	22.1
Total	77	100

Source: Primary data

FIGURE 4.13



INTERPRETATION:

From the table above it is clear that most of the respondents selecting Reliability about the electric vehicles and motorcycle (33%). Then the 31% of the respondents are concerned about the Safety. 22% of the respondents are concerned about High maintenance cost. Then the remaining 14% of the respondents are concerned about Range anxiety.

4.14 AVAILABILITY OF CHARGING INFRASTRUCTURE IMPACT

TABLE 4.14

Options	Frequency	Percentage
It increases interest in purchasing electric vehicles and motorcycles	37	48.1
It decreases interest in purchasing electric vehicles and motorcycles	18	23.4
It has no effect on consumer perception	5	6.5
It depends on the location of the charging infrastructure	17	22.1
Total	77	100

Source: Primary data

TABLE 4.14.1

Options	Frequency	Mean	Rank
It increases interest in purchasing electric vehicles and motorcycles	37	0.48	1
It decreases interest in purchasing electric vehicles and motorcycles	18	0.23	2
It has no effect on consumer perception	5	0.064	4
It depends on the location of the charging infrastructure	17	0.22	3
Total	77		

INTERPRETATION:

From the table above it is clear that majority of the respondents prefer increase in the purchasing power of electric vehicles and motorcycles so it is considered as rank 1. 18 respondents choose it decreases interest in purchasing EV and motorcycles so it is ranked as 2. 17 respondents choose it depends on the location of the charging infrastructure so it is ranked as rank 3

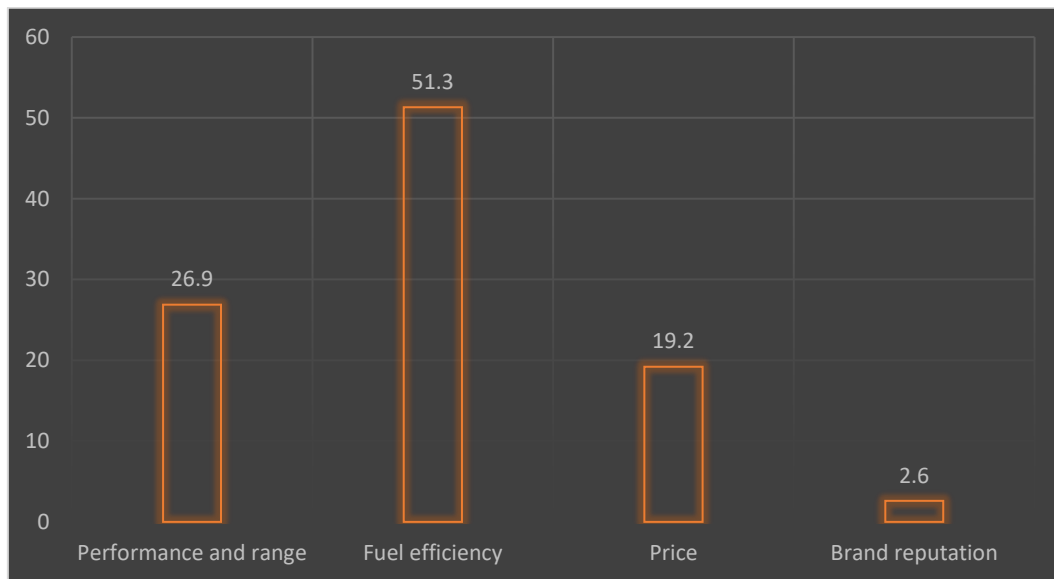
4.15 FACTORS INFLUENCES

TABLE 4.15

Options	Frequency	Percentage
Performance and range	21	26.9
Fuel efficiency	40	51.3
Price	15	19.2
Brand reputation	2	2.6
Total	78	100

Source: Primary data

FIGURE 4.15



INTERPRETATION:

From the table above it is clear that majority of the respondents prefer fuel efficiency (51%). Then the 28% of the respondents prefer performance and range. 19% of the respondents prefer price then the remaining prefer brand reputation.

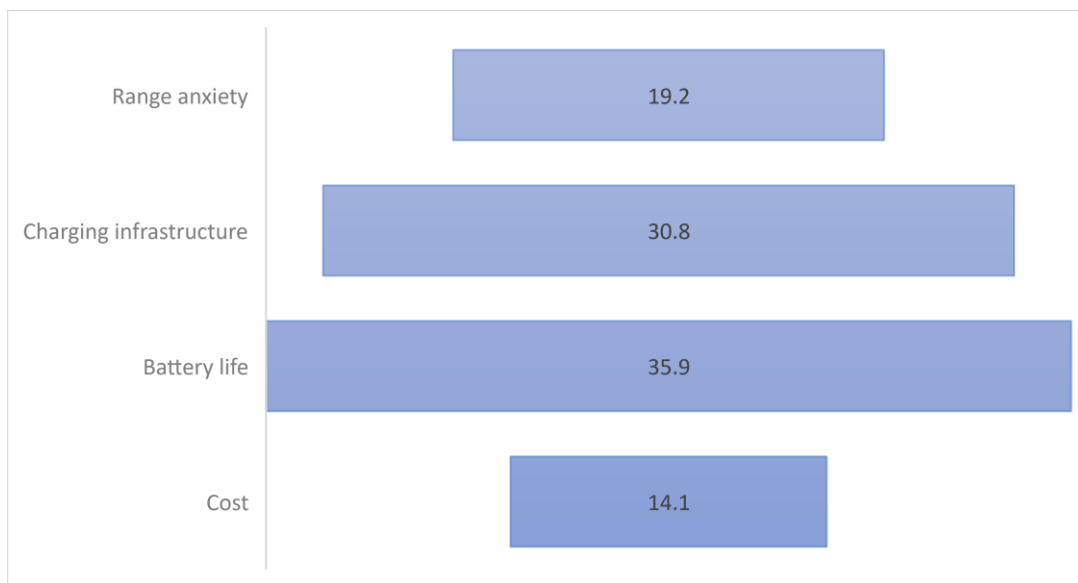
**4.16 PRIMARY CONCERN FOR CONSUMERS WHEN CONSIDERING
PURCHASING AN ELECTRIC VEHICLE**

TABLE 4.16

Options	Frequency	Percentage
Range anxiety	15	19.2
Charging infrastructure	24	30.8
Battery life	28	35.9
Cost	11	14.1
Total	78	100

Source: Primary data

FIGURE 4.16



INTERPRETATION:

From the table above it is clear that majority of the respondents are selecting battery life when purchasing an electric vehicle (37%). Then 30% of the respondents are selecting charging infrastructure.19% of the respondents are selecting Range anxiety then the remaining are concerned about the cost.

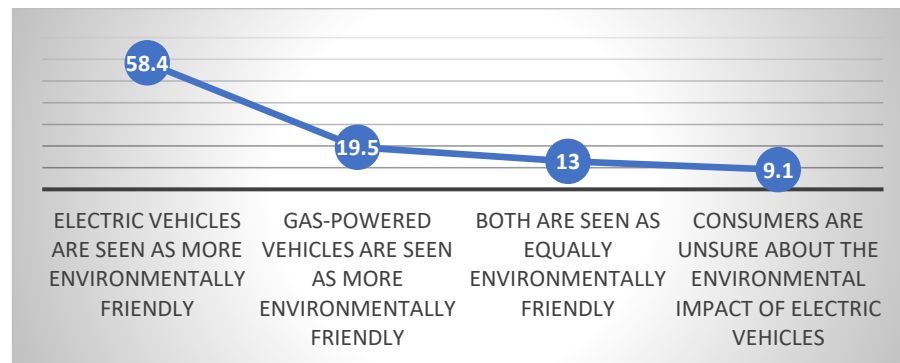
4.17 ENVIRONMENTAL IMPACT OF ELECTRIC VEHICLES COMPARED TO TRADITIONAL GAS-POWERED VEHICLES

TABLE 4.17

Options	Frequency	Percentage
Electric vehicles are seen as more environmentally friendly	45	58.4
Gas-powered vehicles are seen as more environmentally friendly	15	19.5
Both are seen as equally environmentally friendly	10	13
Consumers are unsure about the environmental impact of electric vehicles	7	9.1
Total	77	100

Source: Primary data

FIGURE 4.17



INTERPRETATION:

From the table above it is clear that majority of the respondents are selecting electric vehicles as more environmentally friendly (58%). 19% of the respondents are choosing gas powered vehicles are environmentally friendly. 14% of the respondents are selecting both as equal to environmentally friendly. 9% of the respondents are unsure about the environmental impact.

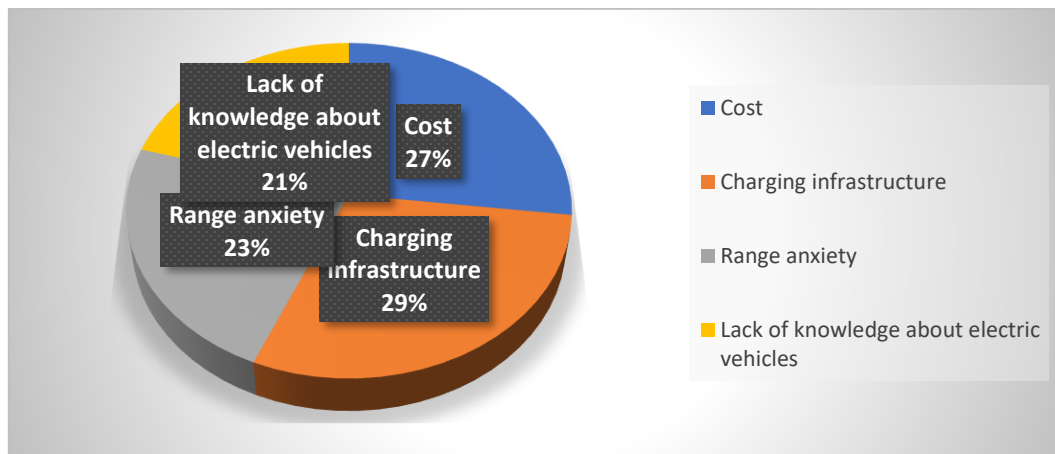
4.18 BIGGEST BARRIER TO WIDESPREAD ADOPTION OF ELECTRIC VEHICLES

TABLE 4.18

Options	Frequency	Percentage
Cost	21	26.9
Charging infrastructure	23	29.5
Range anxiety	18	23.1
Lack of knowledge about electric vehicles	16	20.5
Total	78	100

Source: Primary data

FIGURE 4.18



INTERPRETATION:

From the table above it is clear that 29% of the respondents' barriers to charging infrastructure the widespread adoption of electric vehicles. 27% of the respondents prefer cost. Then 24% prefer Range anxiety. Then the remaining 20% of the respondents choose lack of knowledge about electric vehicles.

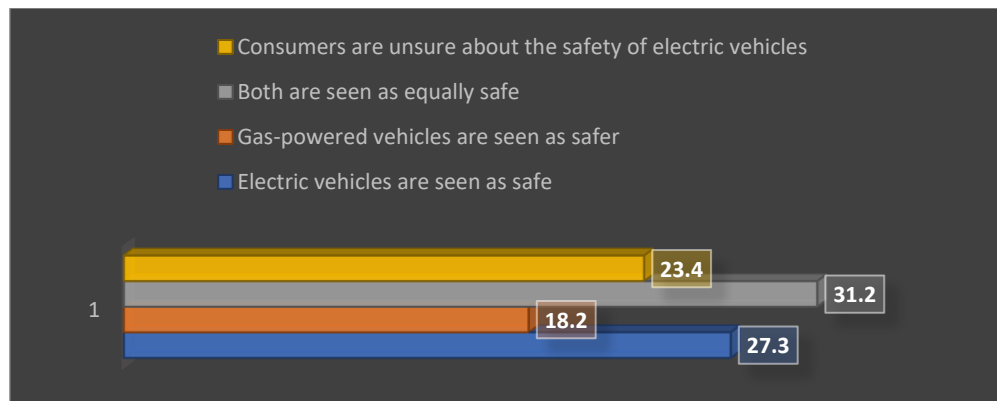
4.19 SAFETY OF ELECTRIC VEHICLES COMPARED TO TRADITIONAL GAS-POWERED VEHICLES

TABLE 4.19

Options	Frequency	Percentage
Electric vehicles are seen as safe	21	27.3
Gas-powered vehicles are seen as safer	14	18.2
Both are seen as equally safe	24	31.2
Consumers are unsure about the safety of electric vehicles	18	23.4
Total	77	100

Source: Primary data

FIGURE 4.19



INTERPRETATION:

From the table above it is clear that 30% of the respondents prefer both are seen as equally safe. Then 27% respondents choose electric vehicles as Safe. Then 25% of respondents selected consumers are unsure about the safety of electric vehicles. Remaining says that gas powered vehicles are seen as Safe.

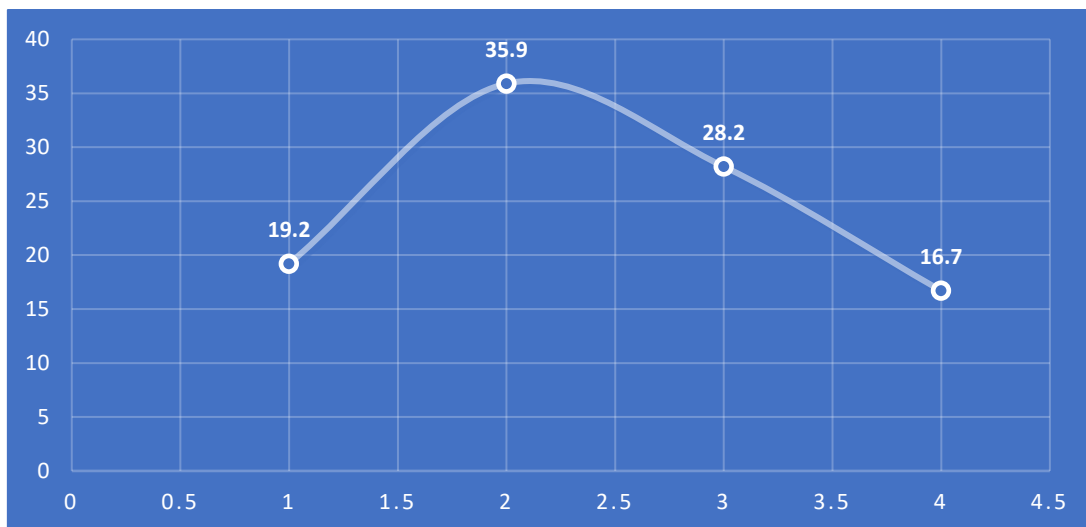
**4.20 FACTORS IS NOT A MAJOR CONSIDERATION FOR
CONSUMERS WHEN PURCHASING AN ELECTRIC VEHICLE OR
MOTORCYCLE**

TABLE 4.20

Options	Frequency	Percentage
Range	15	19.2
Price	28	35.9
Charging time	22	28.2
Fuel efficiency	13	16.7
Total	78	100

Source: Primary data

FIGURE 4.20



INTERPRETATION:

From the table above it is clear that 35% of the respondents prefer that price is major consideration when purchasing electric vehicles or motorcycles. 28% of the respondents considering that it is charging time. 20% of the respondents select range. Then the Remaining 17% selects fuel efficiency.

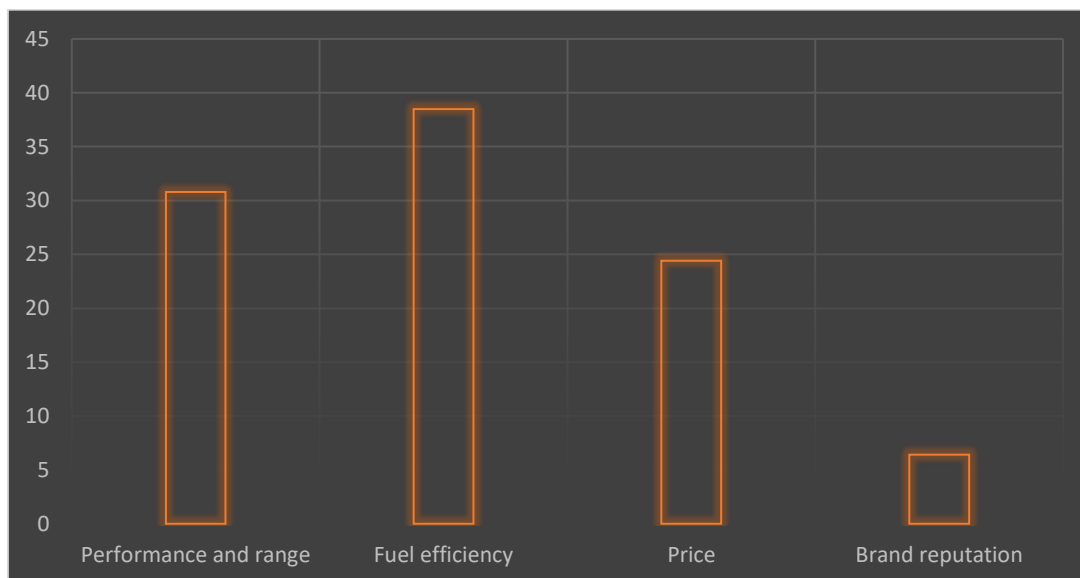
4.21 FACTORS INFLUENCE CONSUMER PERCEPTION TOWARDS TRADITIONAL GAS-POWERED VEHICLES

TABLE 4.21

Options	Frequency	Percentage
Performance and range	24	30.8
Fuel efficiency	30	38.5
Price	19	24.4
Brand reputation	5	6.4
Total	78	100

Source: Primary data

FIGURE 4.21



INTERPRETATION:

From the table above it is clear that majority of the respondents prefer fuel efficiency (38%). Then the 32% of the respondents prefers price then the remaining 6% prefer brand reputation

4.22 ELECTRIC MOTORCYCLES COMPARE TO ELECTRIC CARS

TABLE 4.22

Options	Frequency	Percentage
Consumers are more interested in electric cars than electric motorcycles	18	24
Consumers are more interested in electric motorcycles than electric cars	28	37.3
Consumer interest in both is about the same	7	9.3
It depends on the region and market	22	29.3
Total	75	100

Source: Primary data

TABLE 4.22.1

Options	Frequency	Mean	Rank
Consumers are more interested in electric cars than electric motorcycles	18	0.24	3
Consumers are more interested in electric motorcycles than electric cars	28	0.373	1
Consumer interest in both is about the same	7	0.093	4
It depends on the region and market	22	0.29	2
Total	75		

INTERPRETATION:

From the table above it is clear that majority of the respondents prefer that the consumers are more interested in electric motor cycles than electric cars so it can be ranked as 1. From the response rank 2 is it depends on the region and market and rank 3 is customer are more interested in the electric car than electric motorcycles.

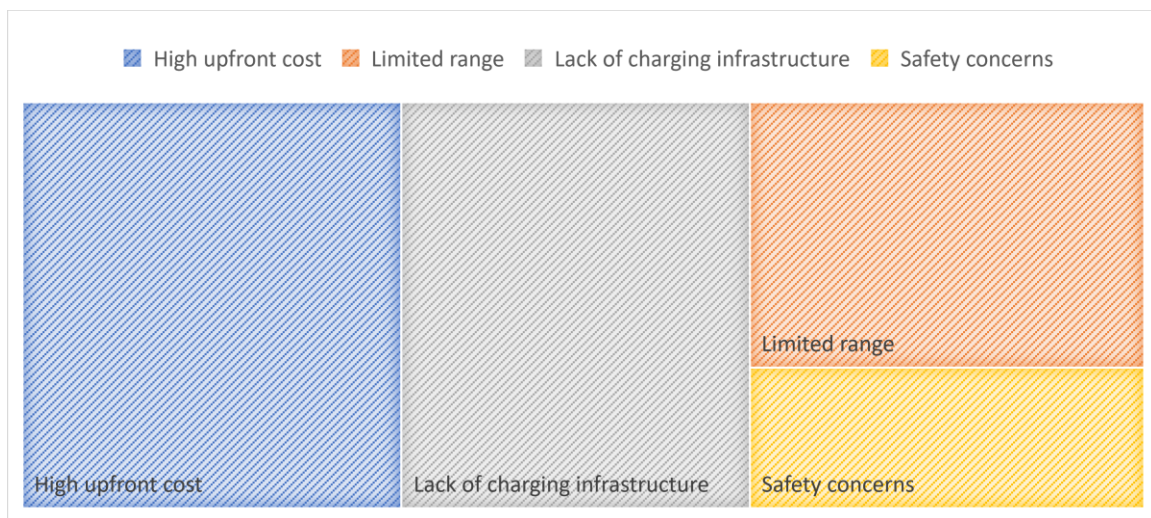
4.23 PRIMARY BARRIER TO WIDESPREAD ADOPTION OF ELECTRIC VEHICLES AND MOTORCYCLES

TABLE 4.23

Options	Frequency	Percentage
High upfront cost	25	33.8
Limited range	17	23
Lack of charging infrastructure	23	31.1
Safety concerns	9	12.2
Total	74	100

Source: Primary data

FIGURE 4.23



INTERPRETATION:

From the table above it is clear that 33% of the respondents' barriers to the high upfront cost the widespread adoption of electric vehicles and motor cycles. 31% of the respondents prefer lack of charging infrastructure. Then 24% prefer limited range. Then the remaining 12% of the respondents choose safety concerns.

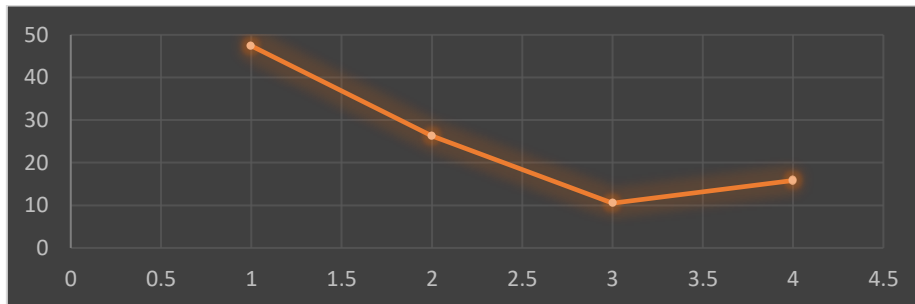
**4.24 PURCHASE PRICE OF ELECTRIC VEHICLES AND
MOTORCYCLES COMPARE TO THEIR GAS-POWERED
COUNTERPARTS**

TABLE 4.24

Options	Frequency	Percentage
They are generally more expensive	36	47.4
They are generally less expensive	20	26.3
They are about the same price	8	10.5
It depends on the specific model	12	15.8
Total	76	100

Source: Primary data

FIGURE 4.24



INTERPRETATION:

From the table above it is clear that 47% of the respondents prefer they are generally more expensive. Then the 26% of the respondents prefer they are generally less expensive, 17% of the respondent prefer it depends on the specific model & remaining 10% prefer they are about the same price.

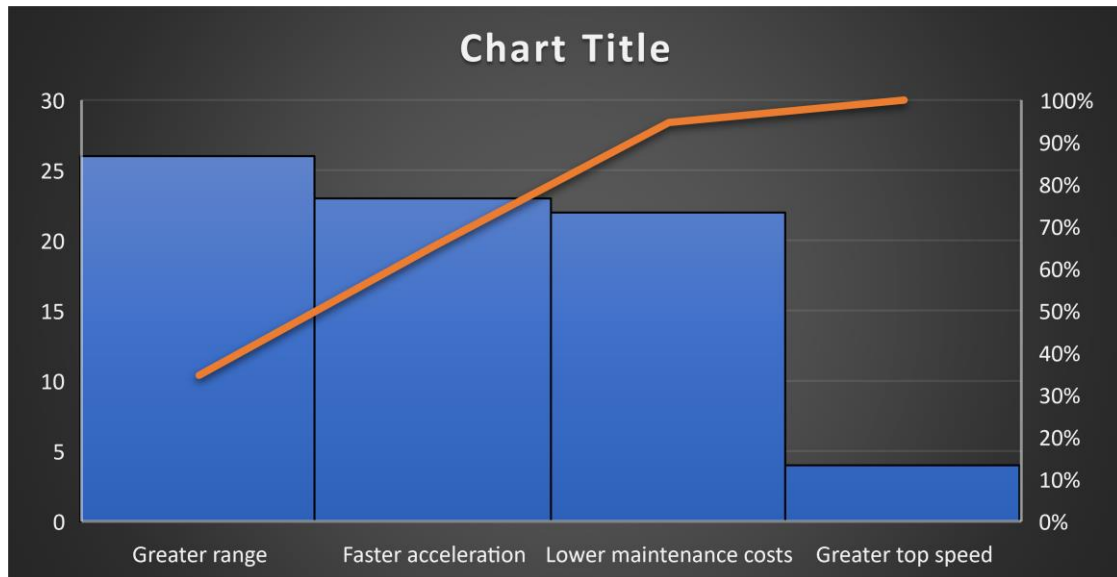
4.25 BENEFIT OF ELECTRIC MOTORCYCLES OVER GAS-POWERED ONES

TABLE 4.25

Options	Frequency	Percentage
Lower maintenance costs	22	29.3
Greater range	26	34.7
Faster acceleration	23	30.7
Greater top speed	4	5.3
Total	75	100

Source: Primary data

FIGURE 4.25



INTERPRETATION:

From the table above it is clear that most of the respondent selected that greater range (34%). 32% of respondent prefer faster acceleration. Then 29% of respondent prefer lower maintenance costs and remaining 5% of respondent choose greater top speed.

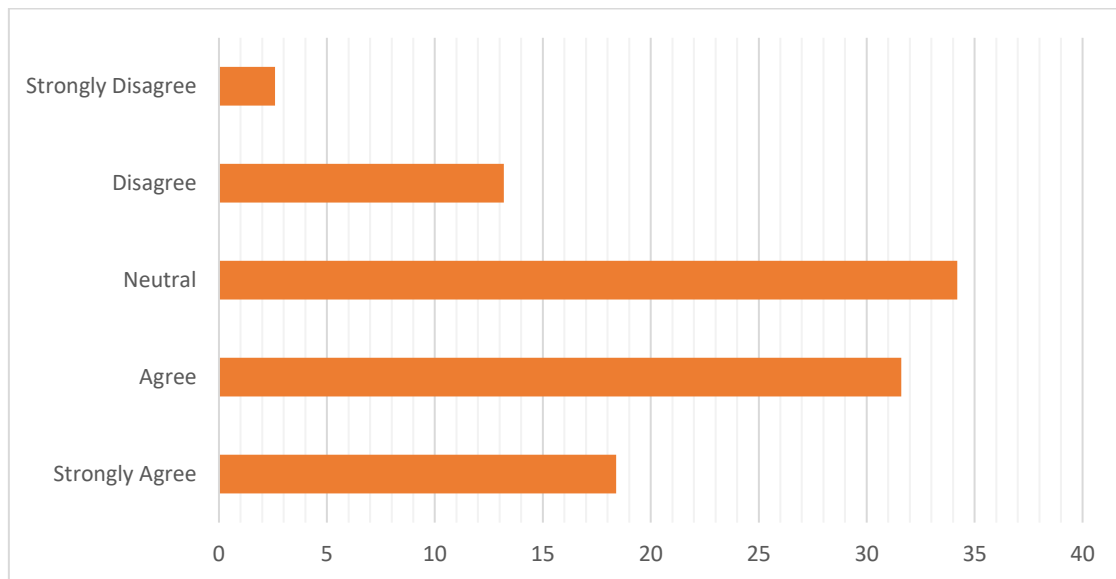
4.26 ATTITUDE TOWARDS GOVERNMENT INCENTIVES

TABLE 4.26

Options	Frequency	Percentage
Strongly Agree	14	18.4
Agree	24	31.6
Neutral	26	34.2
Disagree	10	13.2
Strongly Disagree	2	2.6
Total	76	100

Source: Primary data

FIGURE 4.26



INTERPRETATION:

From the table above it is clear that majority of the respondents choose that the attitudes towards govt incentives are 34% neutral. Then 33% of the respondents choose agree & 18% of respondent choose strongly agree, 13% of respondents choose disagree and remaining 2% of respondent choose strongly disagree.

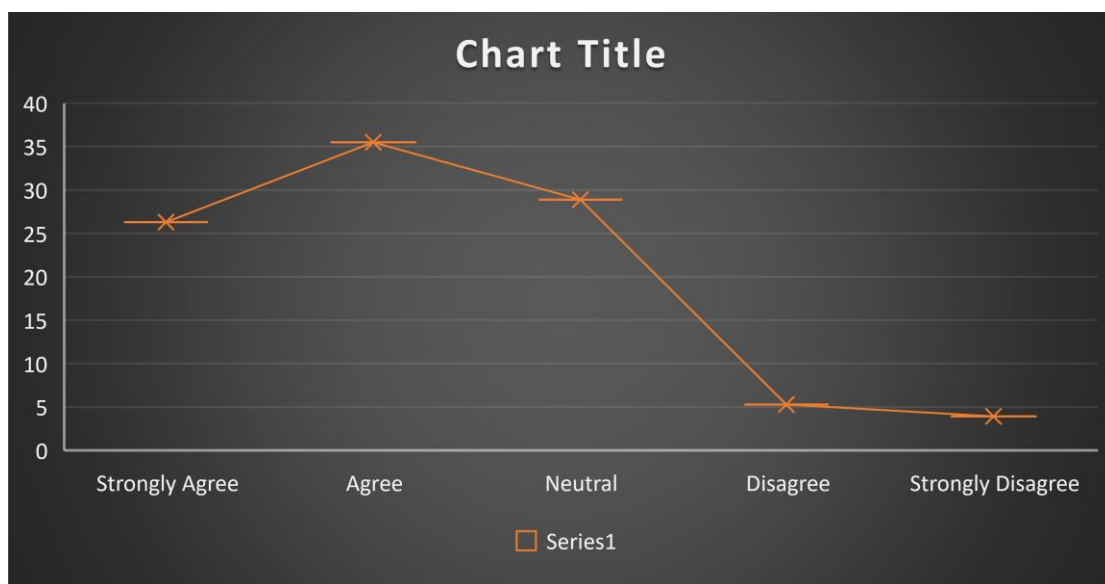
4.27 NUMBER OF CHARGING STATIONS FOR EV ARE LESS

TABLE 4.27

Options	Frequency	Percentage
Strongly Agree	20	26.3
Agree	27	35.5
Neutral	22	28.9
Disagree	4	5.3
Strongly Disagree	3	3.9
Total	76	100

Source: Primary data

FIGURE 4.27



INTERPRETATION:

From the table above it is clear that the 35% of the respondents refer agree in the number of charging station for EV are less. Then 30% of the respondents prefer neutral & 26% of respondents prefer they are strongly agreed, 4% of respondent prefer disagree & remaining 3% of respondent choose strongly disagree.

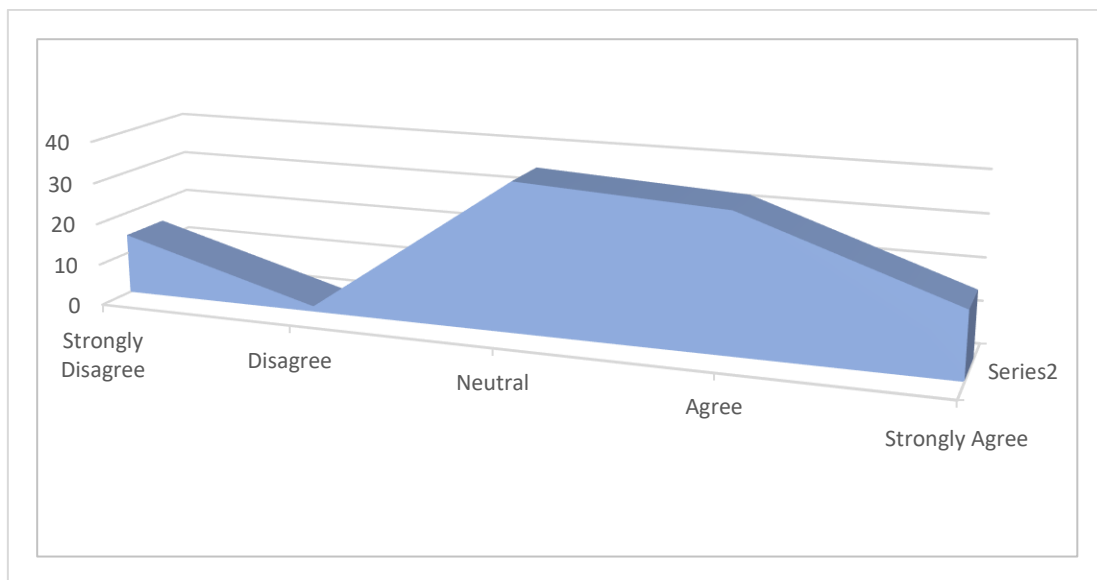
4.28 ELECTRIC VEHICLES WILL GAIN MORE POPULARITY IN FUTURE

TABLE 4.28

Options	Frequency	Percentage
Strongly Disagree	11	14.5
Disagree	1	1.3
Neutral	27	35.5
Agree	25	32.9
Strongly Agree	12	15.8
Total	76	100

Source: Primary data

FIGURE 4.28



INTERPRETATION:

From the table above it is clear that respondent choose 35% neutral, 34% of respondent chooses agree and 16% of respondent prefer strongly agree. Then 14% of respondent choose strongly disagree & remaining 1% choose disagree.

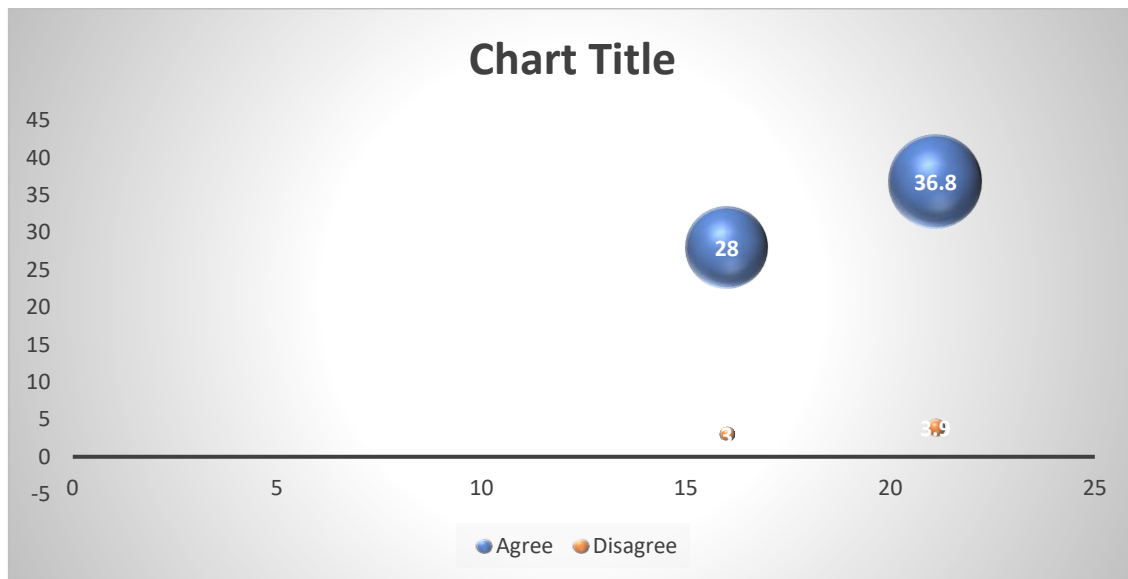
4.29 PRICE OF ELECTRIC VEHICLES IS HIGH

TABLE 4.29

Options	Frequency	Percentage
Strongly Agree	16	21.1
Agree	28	36.8
Neutral	28	36.8
Disagree	3	3.9
Strongly Disagree	1	1.3
Total	76	100

Source: Primary data

FIGURE 4.29



INTERPRETATION:

From the table above it is clear that the price of EV is high, 38% of respondents choose neutral, 36% of respondents choose agree & 21% of respondent choose strongly agree. Then disagree (3%) & remaining 1% choose strongly disagree.

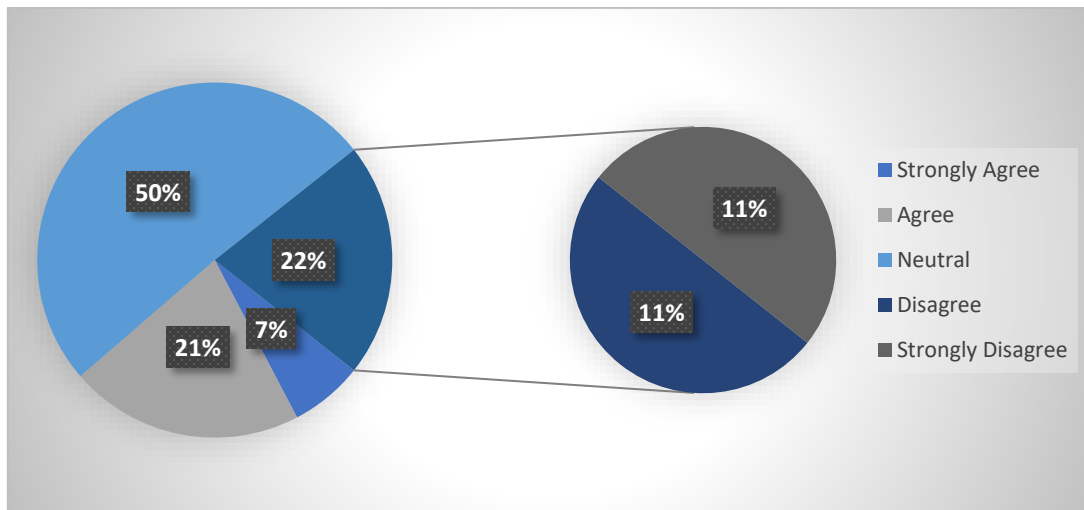
4.30 ATTITUDE OF RESPONDENTS TOWARDS SHIFTING TO ELECTRIC VEHICLES

TABLE 4.30

Options	Frequency	Percentage
Strongly Agree	5	6.7
Agree	16	21.3
Neutral	38	50.7
Disagree	8	10.7
Strongly Disagree	8	10.7
Total	75	100

Source: Primary data

FIGURE 4.30



INTERPRETATION:

From the table above it is clear that majority of the respondent's attitudes towards shifting to electric vehicles neutral (50%). Then 22% of respondent prefer agree & 11% respondents prefer disagree & strongly disagree. Then remaining 5% choose strongly agree.

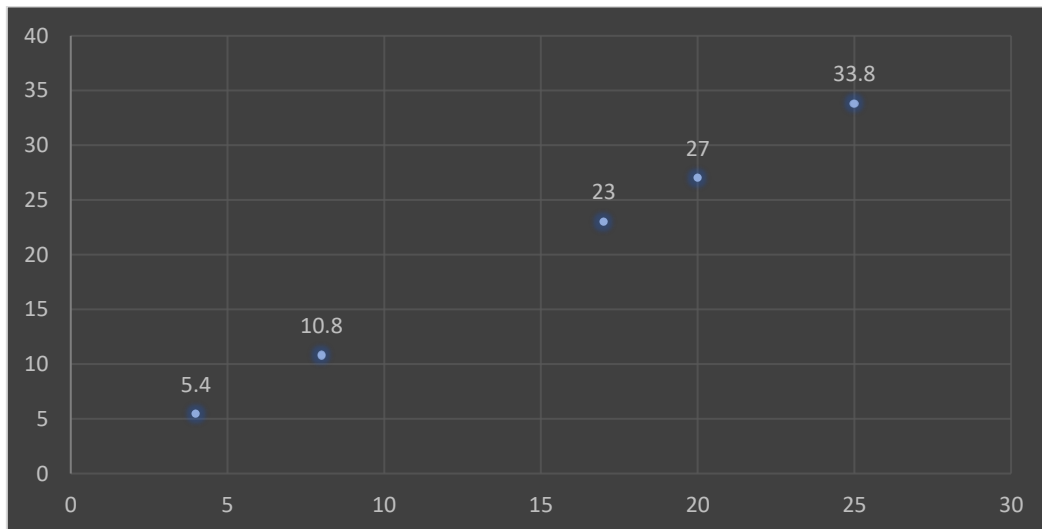
4.31 COST OF BATTERY REPLACEMENT IS HIGH

TABLE 4.31

Options	Frequency	Percentage
Strongly Agree	17	23
Agree	20	27
Neutral	25	33.8
Disagree	4	5.4
Strongly Disagree	8	10.8
Total	74	100

Source: Primary data

FIGURE 4.31



INTERPRETATION:

From the table above it is clear that of battery replacement is high, 33% of respondent choose neutral, 28% of the respondents prefer agree & 23% of respondent prefer strongly agree. Then 11% of respondent prefer strongly disagree & remaining 4% prefer disagree.

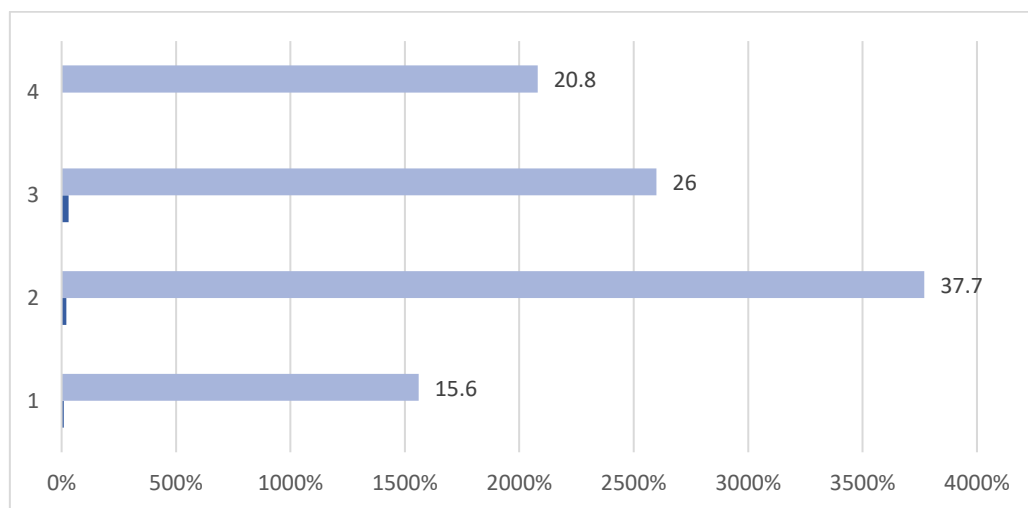
**4.32 PERCENTAGE OF CONSUMERS HAVE EXPRESSED INTEREST
IN PURCHASING AN ELECTRIC VEHICLE IN THE NEXT FIVE
YEARS**

TABLE 4.32

Options	Frequency	Percentage
10%	12	15.6
20%	29	37.7
30%	20	26
>40%	16	20.8
Total	77	100

Source: Primary data

FIGURE 4.32



INTERPRETATION:

From the table above it is clear that 38% of respondents choose 20% of consumer have expressed interest in purchasing an EV in next 5 years, 26% respondent chooses 30% consumers, 21% respondent chooses >40% of consumers

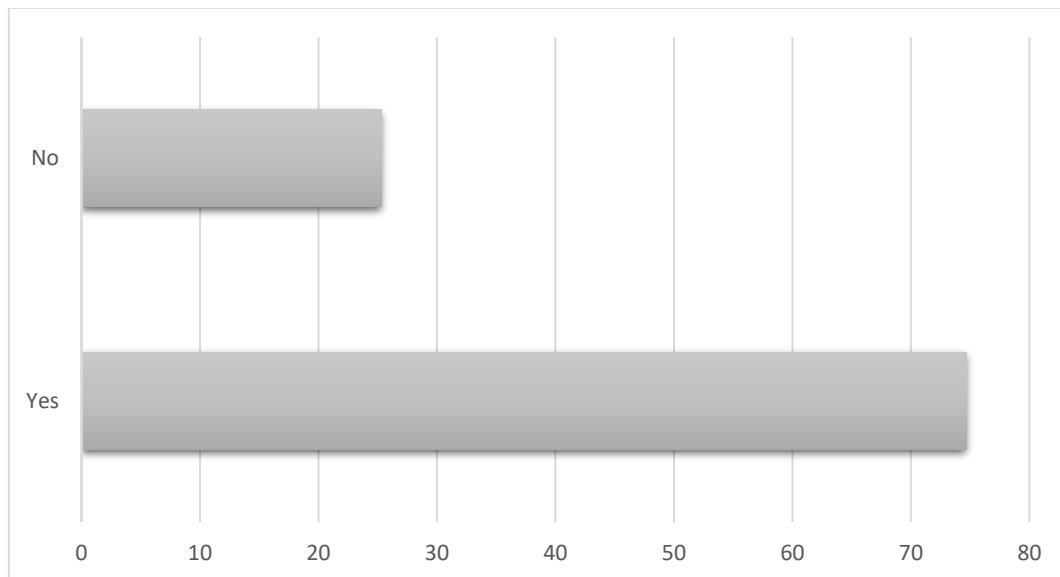
4.33 PLANNING TO BUY ELECTRIC VEHICLES IN THE FUTURE

TABLE 4.33

Options	Frequency	Percentage
Yes	59	74.7
No	20	25.3
Total	79	100

Source: Primary data

FIGURE 4.33



INTERPRETATION:

From the table above it is clear that majority of respondents in buying an EV in future 75% of respondent prefer yes and the remaining 25% choose no.

CHAPTER - 5
FINDINGS, SUGGESTIONS AND CONCLUSION

5. FINDINGS, SUGGESTION AND CONCLUSION

5.1 FINDINGS

1. Majority of the transportation mode is Fuel Vehicles (58%) and the Motorcycle is 30%, then 14% of the respondents equally prefers electric vehicles and others.
2. Majority of the respondents heard about the electric vehicles from the social media (48%). 24% of the respondents heard about the electric vehicles from friends and family. Then the remaining 22% of the respondents heard from advertisement and 6% heard from newspaper.
3. Majority of the respondents choose that higher maintenance cost (38%) then 23% of the respondents prefer lower fuel cost. Then the 20% of the respondents prefer improves performance. Then the remaining 19% of the respondents are preferred reduced emission
4. Most of the respondents choose that electric vehicles are cost saving (64%). 22% of the respondents prefer environmental concern. Then the improved technology and government incentives are preferred by the 7% and 8% by the respondents.
5. Most of the respondents prefer fuel efficiency (55%) then the 28% of the respondents prefer environmentally friendly. Then the 10% and 7% of the respondents chooses performance and affordability.
6. Most of the respondents selected that a positive attitude towards electric vehicles (63%) and 30% of the respondents are in neutral. The remaining 8% of the respondents are in negative attitude towards electric vehicles.
7. Most of the respondents prefers the positive policies such as subsidies and tax credit. So, we rank this as 1. 16 respondents for government policy have no impact and 16 for consumer are unsure about the impact so both are ranked as 2.
8. Most of the respondents selecting reliability about the electric vehicles and motorcycle (33%). Then the 31% of the respondents are concerned about the safety. 22% of the respondents are concerned about high maintenance cost. Then the remaining 14% of the respondents are concerned about range anxiety.
9. Majority of the respondents prefer increase in the purchasing power of electric vehicles and motorcycles so it is considered as rank 1. 18 respondents choose it decreases interest

in purchasing ev and motorcycles so it is ranked as 2. 17 respondents choose it depends on the location of the charging infrastructure so it is ranked as rank 3

10. Majority of the respondents prefer fuel efficiency (51%). Then the 28% of the respondents prefer performance and range. 19% of the respondents prefer price then the remaining prefer brand reputation.
11. majority of the respondents are selecting battery life when purchasing an electric vehicle (37%). Then 30% of the respondents are selecting charging infrastructure.19% of the respondents are selecting range anxiety then the remaining are concerned about the cost.
12. Majority of the respondents are selecting electric vehicles as more environmentally friendly (58%). 19% of the respondents are choosing gas powered vehicles are environmentally friendly. 14% of the respondents are selecting both as equal to environmentally friendly.9% of the respondents are unsure about the environmental impact.
13. 29% of the respondents' barriers to charging infrastructure the widespread adoption of electric vehicles. 27% of the respondents prefer cost. Then 24% prefer range anxiety. Then the remaining 20% of the respondents choose lack of knowledge about electric vehicles.
14. 30% of the respondents prefer both are seen as equally safe. Then 27% respondents choose electric vehicles as safe. Then 25% of respondents selected consumers are unsure about the safety of electric vehicles. Remaining says that gas powered vehicles are seen as safe.
15. 35% of the respondents prefer that price is major consideration when purchasing electric vehicles or motorcycles. 28% of the respondents considering that it is charging time. 20% of the respondents select range. Then the remaining 17% selects fuel efficiency.
16. Majority of the respondents prefer fuel efficiency (38%). Then the 32% of the respondents prefers price then the remaining 6% prefer brand reputation
17. majority of the respondents prefer that the consumers are more interested in electric motor cycles than electric cars so it can be ranked as 1. From the response rank 2 is it depends on the region and market and rank 3 is customer are more interested in the electric car than electric motorcycles.
18. 29% of the respondents' barriers to charging infrastructure the the widespread adoption of electric vehicles and motor cycles.31% of the respondents prefer lack of charging infrastructure. Then 24% prefer limited range. Then the remaining 12% of the respondents choose safety concerns.

- 19.** 47% of the respondents prefer they are generally more expensive. Then the 26% of the respondents prefer they are generally less expensive,17% of the respondent prefer it depends on the specific model & remaining 10% prefer they are about the same price.
- 20.** Most of the respondent selected that greater range (34%). 32% of respondent prefer faster acceleration. Then 29% of respondent prefer lower maintenance costs and remaining 5% of respondent choose greater top speed.
- 21.** Majority of the respondents choose that the attitudes towards govt incentives are 34% neutral. Then 33% of the respondents choose agree & 18% of respondent choose strongly agree,13% of respondents choose disagree and remaining 2% of respondent choose strongly disagree.
- 22.** 35% of the respondents refer agree in the number of charging station for ev are less. Then 30% of the respondents prefer neutral & 26% of respondents prefer they are strongly agreed,4% of respondent prefer disagree & remaining 3% of respondent choose strongly disagree.
- 23.** Respondent choose 35% neutral,34% of respondent chooses agree and 16% of respondent prefer strongly agree. Then 14% of respondent choose strongly disagree & remaining 1% choose disagree.
- 24.** the price of ev is high,38% of respondents choose neutral,36% of respondents choose agree & 21% of respondent choose strongly agree. Then disagree (3%) & remaining 1% choose strongly disagree.
- 25.** Majority of the respondents attitudes towards shifting to electric vehicles neutral (50%) . Then 22% of respondent prefer agree & 11% respondents prefer disagree & strongly disagree. Then remaining 5% choose strongly agree.
- 26.** It is clear that of battery replacement is high, 33% of respondent choose neutral,28% of the respondents prefer agree &23% of respondent prefer strongly agree. Then 11% of respondent prefer strongly disagree & remaining 4% prefer disagree.
- 27.** 38% of respondents choose 20% of consumer have expressed interest in purchasing an ev in next 5 years, 26% respondent chooses 30% consumers, 21% respondent chooses >40% of consumers
- 28.** Majority of respondents in buying an ev in future 75% of respondent prefer yes and the remaining 25% choose no.

5.2 SUGGESTIONS

- Identify the key benefits and drawbacks of electric vehicles from the consumer's perspective, such as lower fuel costs, environmental friendliness, limited driving range, and higher upfront costs.
- Conduct surveys, focus groups, or interviews to gather data on consumers' beliefs, opinions, and behaviours regarding electric vehicles. For example, explore factors that may influence consumers' decision to purchase or avoid electric vehicles, such as social norms, perceived risks, and marketing messages.
- Analyse how automakers and other industry players promote electric vehicles to consumers, such as through advertising campaigns, social media, or dealership experiences. Consider how these strategies may shape consumer perceptions and purchasing decisions.
- Evaluate the role of government policies, such as tax incentives, subsidies, and infrastructure investments, in encouraging or discouraging the adoption of electric vehicles. Examine how these policies may affect consumer perceptions of electric vehicles as a viable transportation option.
- By increasing the number of charging stations, more people will be interested in purchasing electric vehicles.
- The cost of petrol is increasing gradually. With the use of electric vehicles, the issue of growing petrol prices can be solved. The government's support of electric cars will contribute to the future development of the nation.
- In the foreseeable future, the market for electric vehicles will expand thanks to reductions in their price
- The government also benefits from the promotion of electric cars by avoiding the need for crude oil and its high cost.
- Educating the public about new electric car modes should be a top priority for businesses.

5.3 CONCLUSION

Electric vehicles (EVs) have become increasingly popular in recent years due to their environmentally friendly features and cost-saving benefits. Consumer perception towards electric vehicles has been a topic of interest for researchers and businesses alike.

Overall, the research suggests that consumer perception towards electric vehicles is generally positive, but there are still some barriers to widespread adoption. Some of the key factors influencing consumer perception include the range of the vehicle, the availability of charging infrastructure, the cost of the vehicle, and concerns over battery life.

Several studies have found that consumers are generally willing to pay a premium for electric vehicles, particularly if they believe the vehicle will save them money in the long run. However, there are still some consumers who are hesitant to purchase electric vehicles due to concerns over range anxiety, lack of charging infrastructure, and the higher upfront cost of the vehicle.

As electric vehicle technology continues to advance and become more affordable, it is likely that consumer perception towards these vehicles will continue to improve. Increased government incentives and investments in charging infrastructure could also help to boost consumer confidence in electric vehicles and drive more widespread adoption.

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ANNEXURE

QUESTIONNAIRE

Dear Madam/Sir,

We, the student of Bharata Mata College, Thrikkakara is engaged in during a dissertation on **“A STUDY ON CONSUMER PERCEPTION TOWARDS ELECTRIC VEHICLES”**.

We request your kind response in this regard by filling up this questionnaire. We assure you that the data collected will be kept confidential and only for academic purpose.

1. Name:

2. Gender

- Male
- Female
- Others

3. Age

- < 20
- 20 - 30
- 30 - 40
- > 40

4. Profession

- Government Employed
- Self - Employed
- Fresher (Job Seeking)

5. Education Qualification

- U.G
- P.G
- Diploma
- Prefer not to say
- Other:

6. Which demographic is most likely to show interest in purchasing an electric vehicle?b

- Young adults
- Middle-aged adults

- Senior citizens
 - All of the above
7. What is your current mode of transportation?
- Motorcycle
 - Fuel Vehicle
 - Electric Vehicle
 - Other
8. Which of the following is not a benefit of electric vehicles?
- Reduced emissions
 - Lower fuel costs
 - Improved performance
 - Higher maintenance costs
9. Which factor is most likely to cause consumers to switch from a gas-powered vehicle to an electric one?
- Cost savings
 - Environmental concerns
 - Improved technology
 - Government incentives
10. What is the main benefit that consumers associate with electric vehicles and motorcycles?
- Fuel efficiency
 - Environmental friendliness
 - Performance
 - Affordability
11. What sort of attitude do you have towards Electric Vehicles
- Positive
 - Negative
 - Neutral
12. How does the government's policy on electric vehicles impact consumer perception towards them?
- Positive policies such as subsidies and tax credits increase consumer perception
 - Negative policies such as high taxes decrease consumer perception
 - Government policy has no impact on consumer perception

- Consumers are unsure about the impact of government policy on their perception towards electric vehicles.

13. Which of the following is a common concern among consumers about electric vehicles and motorcycles?

- Safety
- Reliability
- Range anxiety
- High maintenance costs

14. How does the availability of charging infrastructure impact consumer perception of electric vehicles and motorcycles?

- It increases interest in purchasing electric vehicles and motorcycles.
- It decreases interest in purchasing electric vehicles and motorcycles.
- It has no effect on consumer perception.
- It depends on the location of the charging infrastructure.

15. Which of the following factors is most likely to influence consumer perception towards electric vehicles?

- Performance and range
- Fuel efficiency
- Price
- Brand reputation

16. According to recent surveys, what is the primary concern for consumers when considering purchasing an electric vehicle?

- Range anxiety
- Charging infrastructure
- Battery life
- Cost

17. How do consumers perceive the environmental impact of electric vehicles compared to traditional gas-powered vehicles?

- Electric vehicles are seen as more environmentally friendly
- Gas-powered vehicles are seen as more environmentally friendly
- Both are seen as equally environmentally friendly
- Consumers are unsure about the environmental impact of electric vehicles

18. What is the biggest barrier to widespread adoption of electric vehicles?

- Cost
- Charging infrastructure
- Range anxiety
- Lack of knowledge about electric vehicles

19. How do consumers perceive the safety of electric vehicles compared to traditional gas-powered vehicles?

- Electric vehicles are seen as safer
- Gas-powered vehicles are seen as safer
- Both are seen as equally safe
- Consumers are unsure about the safety of electric vehicles

20. Which of the following factors is NOT a major consideration for consumers when purchasing an electric vehicle or motorcycle?

- Range
- Price
- Charging time
- Fuel efficiency

21. Which of the following factors is most likely to influence consumer perception towards traditional gas-powered vehicles?

- Performance and range
- Fuel efficiency
- Price
- Brand reputation

22. How do consumer perceptions of electric motorcycles compare to electric cars?

- Consumers are more interested in electric cars than electric motorcycles.
- Consumers are more interested in electric motorcycles than electric cars.
- Consumer interest in both is about the same.
- It depends on the region and market.

23. What is the primary barrier to widespread adoption of electric vehicles and motorcycles?

- High upfront cost
- Limited range
- Lack of charging infrastructure

- Safety concerns
24. How does the purchase price of electric vehicles and motorcycles compare to their gas-powered counterparts?
- They are generally more expensive.
 - They are generally less expensive.
 - They are about the same price.
 - It depends on the specific model.
25. Which of the following is a benefit of electric motorcycles over gas-powered ones?
- Lower maintenance costs
 - Greater range
 - Faster acceleration
 - Greater top speed
26. Attitude towards Government Incentives - Yours Opinion
- Strongly Agree
 - Agree
 - Neutral
 - Disagree
 - Strongly Disagree
27. Number of Charging Stations for EV are less - Yours Opinion
- Strongly Agree
 - Agree
 - Neutral
 - Disagree
 - Strongly Disagree
28. Electric Vehicles will gain more popularity in future - Yours Opinion
- Strongly Disagree
 - Agree
 - Neutral
 - Disagree
 - Strongly Disagree
29. Price of Electric Vehicles is high - Yours Opinion
- Strongly Agree

- Agree
- Neutral
- Disagree
- Strongly Disagree

30. Attitude of respondents towards shifting to electric vehicles - Yours Opinion

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

31. Cost of battery replacement is high

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

32. What percentage of consumers have expressed interest in purchasing an electric vehicle in the next five years?

- 10%
- 20%
- 30%
- > 40%

33. Planning to buy electric vehicles in the future

- Yes
- No