PROJECT REPORT

ON

"CONSUMER PERCEPTION ON ELECTRIC VEHICLES"

Submitted in partial fulfilment of the requirements for the award of degree of Master of commerce of the University of Calicut

Submitted by

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CERTIFICATE ON PLAGIARISM CHECK

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DECLARATION

I, **GOPIKA K S,** hereby declare that the project report entitled **"CONSUMER PERCEPTION ON ELECTRIC VEHICLES"** is a bonafide record of project work done by me, in partial fulfillment of the requirement for the award of the degree of Master of Commerce, under the supervision of **Smt. THANZEELA EBRAHIM K, Assistant Professor, Research Department of Commerce**, MES Asmabi College, P.Vemballur. The information and data given in the report is authentic to the best of my knowledge**.**

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Gopika K S

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CHAPTER I

INTRODUCTION

1.1 INTRODUCTION

The global automotive landscape is witnessing a remarkable transition towards sustainable mobility, with electric vehicles (EVs) emerging as a frontrunner in this paradigm shift. EVs are touted for their potential to reduce greenhouse gas emissions and combat climate change, offering a cleaner alternative to traditional internal combustion engine vehicles. As the world grapples with environmental challenges, consumer perception towards EVs has become a focal point of discussion. Consumers' attitudes towards EVs are shaped by various factors, including their perceived environmental friendliness, cost-effectiveness, and practicality. Environmental concerns, in particular, play a significant role in driving consumer interest in EVs, as they seek to align their transportation choices with sustainability goals. In India, the trend of EV adoption is on the rise, propelled by a confluence of factors. Government incentives, such as subsidies and tax benefits, coupled with technological advancements and infrastructure development, have contributed to the increasing popularity of EVs among Indian consumers. Moreover, growing environmental awareness and concerns about air pollution in urban centers have further accelerated the transition towards electric mobility. Against this backdrop, understanding consumer perceptions towards EVs is essential for stakeholders in the automotive industry, policymakers, and researchers. This chapter aims to explore the intricacies of consumer attitudes towards EVs, with a focus on environmental friendliness, and analyze the growing trend of EV adoption in India within the broader context of sustainable transportation.

1.2 STATEMENT OF THE PROBLEM

This research aims to delve into consumer perceptions of electric vehicles (EVs) by addressing the following objectives within the context of a rapidly evolving automotive landscape: Firstly, to gauge the level of consumer awareness regarding electric vehicles. Secondly, to identify and analyze the perceived benefits attributed to electric vehicles by consumers. Lastly, to evaluate the significance of environmental considerations in shaping consumer perceptions and preferences towards EVs. By exploring these

objectives, this study seeks to provide valuable insights into the factors influencing consumer attitudes towards electric vehicles, thus informing strategies to enhance awareness, promote perceived benefits, and address
environmental concerns in fostering greater adoption of EVs.

1.3 OBJECTIVES OF THE STUDY

- To measure the level of awareness among consumers regarding electric vehicles.
- To measure the level of perceived benefits of electric vehicles among consumers
- To examine the influence of perceived benefits of electric vehicles on consumers' overall perception of electric vehicles.

1.4 HYPOTHESIS

H_{01}: There is no significant difference in the level of awareness among consumers regarding electric vehicles

H_{02}: There is no significant difference between the average level of perceived benefits of electric vehicles among consumers and the specified benchmark value.

H_{03}: There is no significant influence of perceived benefits of electric vehicles on consumers' overall perception of electric vehicles.

1.5 SCOPE OF THE STUDY

The study is conducted in Kodungallur Thaluk in Thrissur District and this study has been carried out to understand consumer views on Electric Vehicles (EVs). The study is restricted to only specific groups of consumers, not all EV users in the area. It focuses on awareness, consumer perception, and environmental concerns.

1.6 SIGNIFICANCE OF THE STUDY

Understanding consumer perception of electric vehicles is crucial for their widespread adoption. This study provides valuable insights into the factors influencing consumer attitudes towards EVs, such as range anxiety, charging infrastructure, and cost effectiveness. By identifying these factors, policymakers, manufacturers, and marketers can develop strategies to address concerns and promote the benefits of electric vehicles effectively. Additionally, as the world shifts towards sustainable transportation, this research contributes to reducing greenhouse gas emissions and dependence on fossil

fuels. Ultimately, improving consumer perception of electric vehicles accelerates the transition to a more environmentally friendly and sustainable transportation system, benefiting both society and the planet.

1.7 RESEARCH METHODOLOGY

1.7.1 Research design

The study is descriptive and analytical in nature.

1.7.2 Type of data used

Primary data for the study collected through questionnaires using Google form**.**

1.7.3 Tools for data collection

Questionnaire are used to collect the data

1.7.4 Population of the study

Consumers of Electric Vehicles in Kodungallur Thaluk constitute the population.

1.7.5 Sampling technique

Non probability sampling is used

1.7.6 Sampling method

The convenience sampling method is used

1.7.7 Sample size

The sample size is 100

1.7.8 Tools for data analysis

Percentage analysis, regression analysis and independent sample t test was used for analyzing the data. The analysis were done using Jamovi 2.3.28

1.7.9 Period of the study

The study conducted over a period of 6 months.

1.8 LIMITATIONS OF THE STUDY

- The sample size is limited to 100respondents
- One of the drawbacks is respondent bias.
- The other main limitation is the time constraints
- A sample is collected using a non-probability sampling method, such as convenience sampling. As a result, the study includes the drawbacks of convenience sampling.

1.9 CHAPTERISATION

Chapter I: Introduction

Chapter II: Review of literature

Chapter III: Theoretical framework

Chapter IV: Data Analysis and Interpretation

Chapter V: Findings, Suggestion and Conclusion

CHAPTER II

REVIEW OF LITERATURE

Aditya Kumar (2023), In his study examined Consumer perception towards electric vehicles in India. As per the research, survey participants are conscious of global climate issues and express a willingness to transition from traditional to environmentally friendly vehicles. The cost plays a crucial part in determining whether to buy an electric vehicle (EV). The study highlights the diminishing fossil fuel reserves and the continuous surge in fuel costs, emphasizing the necessity for India to undergo an1energy transition in the automotive sector. The government has taken action by encouraging the adoption of electric vehicles (EVs) and providing purchasing incentives to tackle pollution concerns .

Hafize Nurgül DURMUŞ ŞENYAPAR, AKIL Murat (2023), Analysis of Consumer Behaviour towards Electric Vehicles: Intentions, Concerns, and Policies. Despite developed nations' EV acceptance, strategies for market expansion in developing countries like Turkey are explored. This research examines global EV policies, assesses consumer concerns, and evaluates intentions using behavioural theories. Drawing on 63 publications, bibliometric analysis suggests industry and researcher recommendations for increasing EV market share and reducing carbon footprints.

Tanay Patodia, Shaunak Roy (2023), Understanding Consumer Perceptions and Purchase Intentions of Electric Vehicles: An In-Depth Analysis.

Bryła, Chatterjee, Ciabiada-Bryła (2022) review EV adoption challenges in a systematic literature study, analysing 57 articles from 2015-2022. The research covers purchase, behavioural, and usage intentions. Governments can enhance adoption with toll exemptions, charging access, and incentives, emphasizing awareness, understanding preferences, and addressing risk-benefit beliefs. Patodia and Roy (2023) underscore low EV market penetration in India, citing factors like environmental concerns and costs. Positive environmental effects and no fuel costs motivate, while high electric car costs and limited infrastructure demotivate adoption. Government roles in infrastructure, policies, subsidies, and incentives are crucial for promoting EV sales.

Deepanshu Singh and Manoj Kumawat (2022) studied Electric Vehicles Scenario in India: Trends, Barriers, and Scope. The primary goal was to investigate India's electric mobility situation and the obstacles to switching to electric cars. The development of electric vehicles in India is being hampered by a number of factors, including travel range, battery charging time, initial cost, infrastructure for charging, etc.

Williams Ackaah, Augustus Terry Kanton, C. Adams (2022), studied Adoption of Electric Vehicles: Analysis of Consumer Perception in Ghana. This study aimed to identify factors influencing consumers' intent to buy electric vehicles (EVs) through a questionnaire survey in Kumasi and Accra, Ghana, using a convenient sampling method. Contrary to expectations, emissions reduction wasn't a significant consideration for purchase intention; instead, consumers prioritized driving range and infrastructure availability. The study recommends government incentives for the private sector to establish maintenance centres and ensure a consistent, reliable power supply for EVs.

Tao Ruan, Qin Lv(2022), Public perception of electric vehicles on reddit over the past decade gaining insights into public views on electric vehicles (EVs) is crucial for boosting adoption, leading to substantial reductions in greenhouse gas emissions and addressing climate change. Unlike traditional survey-based approaches, our study utilizes a vast dataset from the Reddit online social network (OSN), analysing 3,437,917 posts from January 2011 to December 2020. We explore topics discussed, sentiment shifts, and diverse perceptions across Reddit communities, aiming for a broader understanding of EV public perception over the past decade.

Silvana Secinaro, Davide Calandra, Federico Lanzalonga, Alberto Ferraris (2022)
Electric vehicles' consumer behaviours: Mapping the field and providing a research agenda

Electric vehicle consumer research, despite international endorsement, lacks a comprehensive review. Our study of 254 electric car market studies fills this gap, unveiling co-citation networks, leading research centres, and dimensions explored by scholars. It enhances the theory of planned behaviour, offering a valuable consumer profile for practitioners and generating research questions to enrich academic discourse.

Imran Ali, Mohammad Naushad (2022), A study to investigate what tempts consumers to adopt electric vehicles. Growing vehicle registrations in India intensify pollution concerns, emphasizing the need for eco-friendly transportation like electric vehicles (EVs). Although EV adoption is slower than desired, this study, analysing 366 respondents, identifies pricing as a crucial factor affecting adoption through Structural Equation modelling and Confirmatory Factor Analysis, signalling a potential shift toward sustainability in the future.

Anil Kumar Dabhade (2022), Amid ongoing research, diminishing fossil fuels, and rising prices, a swift transition to alternative vehicle energy is imperative in India. The automotive sector spearheads the move towards electric vehicles (EVs) as a lasting solution, although their presence on Indian roads remains limited despite government regulations. Support is driven by reduced oil dependence, lower emissions, and enhanced air quality, particularly in urban areas. This study delves into the overlooked aspect of "Consumer Perception of EVs in India."

Ajex Thomas Varghese, VS Abhilash, Sini V Pillai (2021), A study on consumer perception and purchase intention of electric vehicles in India. This study explores Indian consumer perceptions and intentions towards electric vehicle purchases amidst environmental concerns. Government initiatives align with UN climate goals, fostering electric vehicle sales. With India's global vehicle market prominence and electric vehicles' growth potential, the research employs a quantitative approach to examine factors affecting consumer willingness and perception. Findings provide crucial insights for manufacturers and the government in understanding consumer expectations in India.

Zulfiqar Ali Lashari, Joonho Ko, Junseok Jang (2021), Consumers' intention to purchase electric vehicles: Influences of user attitude and perception

The sciencedirect.com study dissects barriers to widespread EV adoption, focusing on consumer attitudes. Despite EVs being promoted as a near-term solution for reducing fossil fuel dependence and greenhouse gas emissions, challenges endure. The research underscores socio-technical barriers, stressing the need to address consumer concerns in policymaking. It provides insights from tech enthusiasts, aiding policymakers and EV engineers in crafting effective energy and transportation policies. A related Sustainability study explores factors influencing EV purchase intentions, emphasizing

environmental and economic perceptions as key predictors and noting the impact of technological concerns.

Mr. Omkar Tupe, Prof. Shweta Kishore, and Dr. Arloph John Vieira (2021). examined Consumer Perception of electric vehicles in India the primary goal was to comprehend Indian consumer perspectives on electric vehicles and factors influencing their purchase decisions. Depleting fossil fuels and increasing costs drive demand for alternative vehicle energy. Electric vehicles are viewed as a promising solution for both industry and the environment in India. Despite government backing, the electric vehicle market in India remains limited. This study examines potential opportunities and delves into consumer perceptions, addressing the challenges of a nascent market for electric vehicles in India.

Dipanjan Acharya, Shubham Tyagi, Suhans Bansal (2021)

Consumer Perception towards Electric Vehicles. This study investigates changes in consumer satisfaction with EV charging infrastructure across 2019 and 2023. The research, building on Chen and Lin's (2022) work, uses 3778 samples from two surveys, revealing increased satisfaction in 2023, changes in charging habits, and preferences in non-first-tier cities. The study identifies mechanisms like perceived control impacting satisfaction, proposing targeted policy implications.

Acharya, Tyagi, and Bansal discuss the global auto industry's shift from Internal Combustion (IC) to zero-emission vehicles. Highlighting India's move toward an all-electric fleet by 2030, they delve into consumers' perceptions and emphasize satisfaction's role in word-of-mouth marketing. The report addresses financial solutions for India's air quality issues, urging action from manufacturers, battery makers, vendors, and utility players.

Vikas Khare; Cheshta J. Khare; Savita Nema and Prashant Baredar (2021), in their study" Current status of electric vehicles in India: an overview examined the current state of electric vehicle infrastructure in India and provides a state-wise breakdown of the number of electric vehicles registered over the past 5 to 10 years. Electric vehicles and plug-in hybrid electric vehicles emerge as favourable alternatives to traditional gasoline and diesel vehicles. The main focus areas of this research include

evaluating the charging infrastructure in India and assessing the grid parity of electric vehicles.

Anil Khurana, VV Ravi Kumar, Manish sidhpuria (2020), A study on the adoption of electric vehicles in India: the mediating role of attitude Global pollution concerns, particularly from internal combustion engines, drive the urgent promotion of electric vehicles (EVs) worldwide. Governments incentivize EV adoption to counter fossil fuel emissions. Challenges, like high costs and charging issues, hinder adoption. India aims for exclusive EVs by 2030. This study, using Indian car owners, identifies attitude (ATT) as a key mediator in shaping EV adoption, analysed through Structural Equation Modelling (SEM).

Sanya Carley, Saba Siddiki, and Sean Nicholson-Crotty (2019), Evolution of plug-in electric vehicle demand: Assessing consumer perceptions and intent to purchase over time

The surge in plug-in electric vehicle (PEV) adoption, fuelled by policy, technological, and industry advancements, relies on consumer interest. This study analyses 2011–2017 data from 21 major U.S. cities, indicating growing intent to purchase PEVs. Evolving factors such as trialability, observability, network effects, and policies play an increasing role in shaping consumer decisions during this period of change.

Pu Johannes Kester, Gerardo Zarazua de Rubens, Benjamin K Sova cool, Lance Noel (2019), bilic perceptions of electric vehicles and vehicle-to-grid (V2G): Insights from a Nordic focus group study .The article explores Nordic public attitudes toward EVs and V2G,stressing their vital role in sustainable transport. It challenges the static view of the public in transport studies, posing key questions about EV and V2G perceptions. Based on data from eight focus groups in five Nordic countries, it identifies themes like sustainability, range, and social aspects. The article concludes by addressing knowledge gaps and the need for diverse information.

FH Syamnur, NA Pambudi, MK Biddinika, NS Wardani (2019), Barriers to the adoption, acceptance and public perceptions of Electric Vehicles (EV) in Indonesia:

Case studies in the city of Surakarta EVs, while reducing emissions, encounter technical hurdles, trailing ICE vehicles in many countries. Public acceptance barriers prompt a quantitative study in Indonesia, surveying Surakarta City residents on price, performance, infrastructure, and acceptance. An incentive policy was incorporated. The results inform policymakers on energy and transportation policies and offer discussion material for EV companies in development.

Milad Ghasri, Ali Ardeshiri, and Taha Rashidi (2019) Perception towards electric vehicles and the impact on consumers' preference. This study, using big data and text mining, examined Chinese consumers' online behaviour regarding EVs. Influential factors included EV prices, car classification, and powertrain types. Preferences leaned toward compact BEVs with fast charging batteries for daily commutes, while PHEV consumers favoured SUV models. Aesthetics, alongside price and specs, played a pivotal role. Valuable for promoting EV adoption and addressing environmental concerns.

Jui-Che Tu and Chun Yang (2019)) Key Factors Influencing Consumers' Purchase of Electric Vehicles .This study integrates TPB, TAM, and IDT to explore factors influencing electric vehicle (EV) purchases. The model effectively gauges consumers' behavioural intentions, with SEM analysis revealing that control over resources significantly impacts intent. Positive attitudes result from perceived individual, environmental, or national benefits of EVs. Social opinions have minimal influence. These findings inform EV design, offer a theoretical basis for popularization, and suggest measures for government and manufacturers to promote sustainable automotive growth.

Milad Ghasri, Ali Ardeshiri, and Taha Rashidi (2019) Perception towards electric vehicles and the impact on consumers' preference. This study, using big data and text mining, examined Chinese consumers' online behaviour regarding EVs. Influential factors included EV prices, car classification, and powertrain types. Preferences leaned toward compact BEVs with fast charging batteries for daily commutes, while PHEV consumers favoured SUV models. Aesthetics, alongside price and specs, played a pivotal role. Valuable for promoting EV adoption and addressing environmental concerns.

R. Goswami, and G. Tripathi (2018) in their study "Electric vehicles in India: financial and environmental perspectives" examined mitigating vehicle emissions poses a significant challenge in worldwide initiatives to tackle climate change. Introducing electric vehicles is considered a potential solution to reduce emissions. This study examines various factors contributing to the 8 total cost of ownership for both conventional and electric cars, considering financial and environmental aspects. Utilizing the equivalent annual annuity (EAA) method to standardize cost drivers across vehicles with different lifespans, the research demonstrates that the total cost of owning an electric car is more cost-effective than that of traditional fossil-fuel vehicles.

Pretty Bhalla, Inass Salamah Ali, Afroze Nazneen (2018), A study of consumer perception and purchase intention of electric vehicles (2018). Their study explores how environmental issues influence India's electric vehicle industry. The nation's skilled workforce and cost effective production attract global manufacturers like Bosch, AVL, and Cummins. Trust in technology and environmental concerns drive perceptions of electric vehicle purchases. Challenges include cost, infrastructure, and societal acceptance, requiring government intervention through environmental policies, enhanced infrastructure, and subsidies to promote electric vehicle sales.

Xiuhong He, Wenjie Zhan, and Yingying Hu (2018), Consumer purchase intention of electric vehicles in China: The roles of perception and personality. In their study published in journal of cleaner production 204, 1060-1069, 2018.Despite strong government support, China's electric vehicle (EV) market share remains modest, with

a majority of consumers hesitant. This paper proposes a framework intertwining personality, perception, and intention to understand consumer behaviour toward EV adoption. Empirical validation with 369 Chinese participants reveals that 57.1% of EV purchase intention variance is explained by consumer perception and personality. Individual openness to innovation and environmental consciousness directly impact intention, which is moderated by positive and negative utilities. The study provides insights for policymakers and manufacturers promoting widespread EV acceptance.

Fanchao Liao, Eric Molin, Bert van Wee (2017), Consumer preferences for electric vehicles: a literature review. Widespread electric vehicle (EV) adoption is crucial for tackling environmental issues, yet current market penetration is limited despite government promotion. This paper extensively reviews consumer preferences for EVs, comparing economic and psychological aspects, outlining a conceptual framework, and categorizing influential factors. It proposes a research agenda to improve studies and provides recommendations for further research.

Ona Egbue, Suzanna Long (2012), Barriers to widespread adoption of electric vehicles: An analysis of consumer attitudes and perceptions. The usage of electric vehicles (EVs) is suggested as a temporary fix to reduce the use of fossil fuels and the greenhouse gas emissions produced by conventional automobiles. Overcoming consumer resistance to new technology is a fundamental barrier that must be addressed if widespread adoption is to occur. This study explores the influence of sustainability on consumer decisions, especially among tech aficionados, and finds socio-technical hurdles. The results help EV engineers and politicians create efficient energy and transportation regulations by incorporating customer preferences into EV design.

CHAPTER III

THEORETICAL FRAMEWORK

CONSUMER OF ELECTRIC VEHICLES

A consumer, in the context of electric vehicles (EVs), refers to an individual or entity that purchases or utilizes these vehicles for personal or commercial transportation needs. Customers have a significant influence on how the market functions and how EVs are perceived. Their preferences, attitudes, and behaviours significantly impact the adoption and success of electric vehicles. Factors such as affordability, range, charging infrastructure, environmental concerns, and government incentives influence consumers' perceptions and decisions regarding EVs. Understanding consumer perceptions is crucial for stakeholders, including manufacturers, policymakers, and marketers, to develop strategies that address concerns, enhance awareness, and advocate for the advantages of electric vehicles. By gaining insight into consumer preferences and barriers, the industry can strive to overcome challenges and accelerate the transition towards a sustainable transportation future powered by electric vehicles.

CONSUMER PERCEPTION

Consumer perception refers to the way individuals interpret and make sense of information about products, services, brands, or experiences in the marketplace. It encompasses the subjective understanding, beliefs, attitudes, opinions, and feelings that consumers have towards these stimuli. Consumer perception is influenced by numerous elements, such as individual experiences, cultural context, social pressures, advertising, and product features.

The significance of consumer perception in shaping consumer behaviour cannot be overstated. It plays a crucial role in influencing purchase decisions, brand loyalty, product satisfaction, and overall consumer satisfaction. Here's how consumer perception impacts consumer behaviour:

- **Purchase Decisions:** Consumer perception heavily influences the choices consumers make when selecting products or services. Positive perceptions, such

as perceiving a product as high quality, innovative, or environmentally friendly, can lead to increased purchase intention and actual buying behaviour.

- **Brand Loyalty:** Consumers' perceptions of brands, including their reputation, image, and perceived value, strongly influence brand loyalty. Positive perceptions of a brand result in repeat purchases and advocacy, while negative perceptions may cause customers to switch brands or avoid them altogether.
- **Product Satisfaction:** Consumer perception shapes expectations about product performance, features, and benefits. When the real product experience meets or surpasses these expectations, it results in greater satisfaction. Conversely, discrepancies between perception and reality can result in dissatisfaction and negative word-of mouth.
- **Price Sensitivity:** Consumers' perceptions of value and quality relative to price influence their price sensitivity. A product perceived as offering high value for the price may justify a higher price point, while a perceived lack of value may lead consumers to seek lower priced alternatives.
- **Word-of-Mouth and Reputation:** Consumer perceptions contribute to a product's reputation and word-of mouth recommendations. Positive perceptions generate favourable word-of-mouth, social sharing, and online reviews, enhancing a product's reputation and driving further consumer interest.
- **Influence of Marketing Communications**: Marketers leverage consumer perception through advertising, branding, packaging, and other marketing communications to shape desired perceptions and influence consumer behaviour. Effective marketing efforts aim to create positive associations and perceptions that align with consumer preferences and needs.

Overall, consumer perception serves as a lens through which individuals evaluate and make decisions regarding goods and trademarks. Businesses must understand and manage consumer perception if they hope to effectively position their goods in the marketplace, build strong brands, and encourage customer involvement and loyalty.

ELECTRIC VEHICLES

Electric vehicles (EVs) are automobiles that are powered by electric motors, using electricity stored in batteries as their primary source of energy. Unlike traditional vehicles that rely on fossil fuels, EVs produce zero tailpipe emissions, making them a cleaner and more environmentally friendly alternative in the field of transportation. They can include electric cars, electric motorcycles, electric scooters, and other vehicles that use electricity for propulsion.

The history of electric vehicles (EVs) in India dates back to the early 20th century, but significant developments have occurred more recently:

- **Early 20th Century:** Electric vehicles had a presence in India in the early 1900s. However, with the rise of1internal combustion engine vehicles, electric vehicles faded from the mainstream.
- **Modern Revival (2010s):** In the 2010s, there was a renewed interest in electric vehicles globally, driven by concerns about air pollution and climate change. India also witnessed a revival of interest in EVs during this period.
- **National Electric Mobility Mission Plan (NEMMP):** Launched in 2013, NEMMP aimed to promote electric and hybrid vehicles in the country. It set ambitious targets for electric vehicle adoption and charging infrastructure development.
- **FAME India Scheme:** In order to promote the production and uptake of electric and hybrid vehicles through incentives, the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) program was launched in 2015. It offered buyers and manufacturers cash incentives.
- **Automaker Initiatives:** Indian automakers started introducing electric vehicles to the market. Mahindra Electric, a subsidiary of Mahindra & Mahindra, played a key role by launching electric cars like the e2o.
- **Government Push:** The Indian government continued to encourage the adoption of electric vehicles through policy measures, incentives, and awareness

campaigns. Various states also announced their EV policies to support the growth of electric mobility.

- **Increased Adoption:** Despite challenges, there has been a gradual increase in the adoption of electric vehicles in India. Two-wheelers and three-wheelers, in particular, have seen growth in the electric segment.

- **Charging Infrastructure Development:** Efforts have been made to develop charging infrastructure across cities, highways, and public spaces to address the range anxiety associated with EVs.

While progress has been made, challenges such as charging infrastructure gaps, high upfront costs, and consumer awareness remain. The Indian government's ongoing commitment to promoting electric mobility and the involvement of automakers continue to shape the trajectory of electric vehicles in the country.
Several companies in India have been actively involved in manufacturing and promoting electric vehicles.

FEATURES OF EV

- **Electric Propulsion:** Electric vehicles (EVs) fundamentally differ from traditional vehicles in their method of propulsion. Instead of relying on traditional combustion engines, EVs utilize electric motors to generate mechanical energy. The car moves ahead thanks to these motors, which take electrical energy from batteries and transform it into rotational motion. This shift to electric propulsion offers several advantages, including smoother acceleration, reduced noise pollution, and increased energy efficiency compared to ICE vehicles.
- **Battery:** At the core of each EV lies its battery pack, a critical component responsible for storing and supplying electrical energy to power the vehicle. Typically composed of lithium-ion cells, these batteries boast high energy density and recharge ability, enabling EVs to achieve significant driving ranges on a single charge. Emerging technologies like solid-state batteries promise even

greater energy density and safety. Battery capacity, measured in kilowatt-hours (kWh), directly impacts an EV's range, with larger capacities equating to longer distances travelled between charges.

- **Regenerative Braking:** A hallmark feature of EVs is regenerative braking, a system that harnesses the kinetic energy dissipated during braking and converts it back into electrical energy. The electric motor turns into a generator when the driver applies the brakes, collecting and storing the energy generated in the battery. This process not only extends the vehicle's range but also enhances overall energy efficiency by recapturing energy that would otherwise be lost as heat during braking.
- **Charging Infrastructure:** For widespread acceptance of electric vehicles (EVs), it's crucial to have a well-developed charging infrastructure in place. This infrastructure includes a range of charging options, including home charging stations, workplace charging facilities, and public charging networks strategically located in urban centres, along highways, and at key destinations. Charging stations may offer different charging speeds, ranging from standard Level 1 chargers (120 volts) to fast-charging Level 3 stations (DC fast chargers), greatly decreasing charging durations and improving convenience for electric vehicle (EV) owners.
- **Range:** An electric vehicle's (EV) range is the furthest it can go on a single charge before requiring recharging. Factors influencing range include battery capacity, driving conditions (such as terrain and weather), driving habits, and vehicle efficiency. Advances in battery technology, coupled with improved aerodynamics and energy management systems, have enabled modern EVs to achieve impressive ranges, with some models surpassing 300 miles (480 kilometres) on a single charge.

- **Performance:** Electric motors deliver instant torque, resulting in responsive acceleration and smooth power delivery, characteristic of EVs. This instantaneous torque output translates to brisk acceleration and enhanced driving

dynamics, offering drivers a thrilling and engaging experience behind the wheel. Many EVs boast impressive performance metrics, including high top speeds and agile handling, rivalling or surpassing those of traditional combustion powered vehicles.

- **Energy Efficiency:** Electric vehicles (EVs) are more energy-efficient compared to their Internal Combustion Engine (ICE) counterparts. Thanks to their direct conversion of electrical energy stored in batteries into mechanical propulsion. This efficiency stems from the absence of energy losses associated with internal combustion processes, such as heat dissipation and mechanical friction. As a result, EVs consume less energy per mile or kilometre travelled, contributing to reduced operating costs and environmental impact.
- **Environmental Benefits:** One of the primary drivers behind the adoption of EVs is their environmental friendliness. By eliminating tailpipe emissions associated with ICE vehicles, EVs help mitigate air pollution and reduce greenhouse gas emissions, thereby combating climate change and improving air quality in urban areas. However, the overall environmental impact of EVs also depends on factors such as the source of electricity used for charging, with renewable energy sources offering the most sustainable option.
- **Smart Features:** Modern EVs are equipped with an array of smart features and connectivity options, enhancing convenience, safety, and entertainment for drivers and passengers alike. These include smartphone integration for remote vehicle monitoring and control, over-the-air software updates to add new features and improve performance, and advanced driver-assistance systems (ADAS) offering semi-autonomous driving capabilities for enhanced safety and convenience.
- **Cost of Ownership:** While the initial purchase price of an EV may be higher than that of a comparable ICE vehicle, EVs typically offer lower long-term ownership costs. This is due to factors such as reduced fuel expenses (electricity

being cheaper than gasoline), lower maintenance requirements (fewer moving parts and no oil changes), and potential incentives and tax credits offered for EV purchases. Over time, these cost savings can balance the initial financial outlay, making EV ownership more economical and financially attractive.

Together, these characteristics help explain why electric cars are becoming more and more commonplace as a more economical and environmentally friendly form of transportation on a global scale.

ADVANTAGES OF EV

- **Environmental Benefits:** Electric vehicles (EVs) offer significant environmental advantages over traditional vehicles powered by internal combustion engines (ICEs). EVs aid in reducing air pollution and tackling climate change by operating with reduced or zero tailpipe emissions. This reduction in greenhouse gas emissions is especially important in densely populated urban areas where pollution from transportation is a big problem. Furthermore, as EVs essentially provide emissions-free mobility when charged with renewable energy, the environmental benefits of EVs are further amplified as renewable energy sources like solar and wind energy become more and more incorporated into the power grid.
- **Cost Savings:** The possibility of cost savings throughout the course of the vehicle's lifetime is one of the main draws of owning an EV. When compared to conventional vehicles powered by gasoline or diesel, electric vehicles usually have cheaper running expenses. Since electricity, the main fuel for electric vehicles (EVs), is frequently less expensive per mile than fossil fuels, EV owners pay less for fuel. Furthermore, EVs require less maintenance and pay less for repairs to the exhaust system, air filter replacements, oil changes, and other items because they have less moving parts than ICE cars. Over time, these cost savings can offset the higher the initial cost of buying an EV, making them a more economical choice for many consumers.
- **Energy Efficiency:** Internal combustion engines are intrinsically less efficient in converting energy into motion than the electric motors found in electric vehicles. Electric motors effectively convert electrical energy stored in batteries

into rotational motion, minimizing energy waste, in contrast to internal combustion engines (ICEs), which rely on burning fuel to generate mechanical power. This higher efficiency translates to better energy utilization and improved overall efficiency in converting energy to motion, resulting in reduced energy consumption per mile or kilometre travelled. As a result, EVs require less energy input to achieve similar levels of performance compared to ICE vehicles, making them a greener and more sustainable option for transportation.

- **Reduced Dependency on Fossil Fuels:** The extensive uptake of electric vehicles (EVs) is essential in diminishing society's reliance on finite fossil fuels, such as motor fuel and diesel. By transitioning to electric propulsion, EVs help diversify the transportation sector's energy sources and promote energy security and sustainability. This reduced dependency on fossil fuels also mitigates the dangers posed by pricing fluctuations and geopolitical tensions in regions rich in oil and gas reserves. Additionally, as renewable energy sources continue to gain prominence, EVs charged using clean energy further contribute to a more robust and sustainable energy system.
- **Incentives:** Governments all around the world provide a range of subsidies and incentives to promote the use of electric cars (EVs) and hasten the switch to greener modes of transportation. These incentives can include tax credits, rebates, grants, and lower registration fees for EV buyers. By reducing the upfront costs associated with EV ownership, these incentives help make electric vehicles more affordable and accessible to a broader range of consumers. Furthermore, government policies promoting EV adoption contribute to market growth, stimulate innovation in EV technology, and support the establishment of charging facilities, facilitating the transition to a low-carbon transportation future.
- **Quiet Operation**: Electric vehicles (EVs) are recognized for their quiet operation compared to traditional vehicles powered by internal combustion engines (ICEs). For both passengers and pedestrians, driving an electric vehicle (EV) is quieter and more comfortable because they don't have noisy engine combustion or mechanical vibrations. This reduction in noise pollution is

particularly noticeable in urban areas, where traffic congestion and vehicle noise can significantly impact the well-being of inhabitants. Due to their quieter operation, electric vehicles contribute to the creation of more serene and enjoyable urban surroundings, thereby enhancing overall well-being and liveability.

- **Technological Advancements:** Ongoing advancements in electric vehicle (EV) technology continue to drive improvements in performance, efficiency, and overall appeal. These technological innovations encompass various aspects of EV design and engineering, including battery technology, electric motor efficiency, charging infrastructure, and vehicle connectivity. For example, advancements in chemistry and manufacturing techniques have resulted in the creation of batteries with longer driving ranges and faster charging capabilities. Similarly, improvements in electric motor design and power electronics have enhanced the performance and efficiency of EV drivetrains, resulting in quicker acceleration and smoother power delivery. Additionally, ongoing research and development efforts focus on enhancing vehicle-to-grid (V2G) capabilities, vehicle autonomy, and sustainable materials usage, further enhancing the attractiveness and competitiveness of electric vehicles in the automotive market.
- **Innovative Designs:** Electric vehicles (EVs) often feature innovative and futuristic designs that reflect advancements in automotive engineering and captivate consumers interested in cutting-edge technology. Unlike traditional vehicles constrained by the design limitations of internal combustion engines (ICEs), EVs offer greater design flexibility and creative freedom for automakers to explore new aesthetic possibilities. This design freedom enables the development of sleek, aerodynamic exteriors, spacious and ergonomic interiors, and innovative packaging solutions that maximize interior space and cargo capacity. Furthermore, EVs may incorporate unique design elements such as regenerative braking systems, integrated aerodynamic features, and advanced lighting technologies that enhance both form and function. As a result, electric vehicles stand out as symbols of innovation and progress in the automobile sector, appealing to consumers seeking vehicles that not only offer superior

performance and efficiency but also embody cutting-edge design and technology.

DISADVANTAGES OF EV

- **Limited Range**: Compared to traditional vehicles fuelled by gasoline or diesel, one of the main worries for owners of electric vehicles (EVs) is the limited driving range on a single charge. Even while contemporary EVs have ranges that are getting greater, there is still a practical limit to how far they can go before needing to be recharged. This limitation is particularly relevant for long-distance travel or in regions with sparse charging infrastructure, where range anxiety may deter potential EV buyers. But newer EV models with longer ranges and quicker charge times are steadily reducing this restriction because to advancements in battery technology and charging infrastructure.
- **Charging Infrastructure:** For electric Vehicles (EVs) to be widely used, a complete charging infrastructure must be developed. Even while there has been a lot of progress made throughout the world to develop charging networks, especially in urban areas and alongside major routes, certain places still lack enough infrastructure. Electric vehicle (EV) charging stations could not be as convenient or commonly available as gas stations for conventional automobiles, especially in rural or remote places. Addressing these infrastructure gaps requires collaboration between government agencies, private companies, and utilities to invest in expanding and improving EV charging infrastructure to enhance accessibility and convenience for EV owners.
- **Charging Time:** Charging an EV typically takes longer than refuelling a traditional vehicle with gasoline. While Level 2 chargers (240 volts) and Level 3 fast chargers (DC fast chargers) offer significantly faster charging speeds than standard household outlets, complete charging still requires more time than a quick stop at a gas station. Fast changing technologies are continually evolving to reduce charging times, but widespread deployment and adoption are still in progress. Furthermore, different locations may have different fast-charging

station availability, which could affect how convenient it is for EV users to charge overall.

- **Upfront Cost:** Buying an electric vehicle (EV) usually has a higher upfront cost than buying a conventional car. This is mostly because of the high cost of battery technology. Even with the continuous decline in pricing due to increased battery output and improved manufacturing efficiencies, electric vehicles (EVs) continue to be more expensive than their gasoline-powered equivalents. However, given that EVs require less frequent maintenance and fuel, it is imperative to examine the total cost of ownership for the duration of the vehicle. Furthermore, government subsidies and incentives may lessen the initial cost barrier and make EVs affordable for end users.
- **Battery Degradation:** Over time, the performance and capacity of batteries in electric vehicles (EVs) can degrade, impacting the vehicle's range and overall efficiency. Factors such as temperature fluctuations, charging habits, and battery chemistry can contribute to battery degradation over time. Even while contemporary EV batteries are made to be strong and long-lasting, deterioration is unavoidable, and as an EV owner's car gets older, their range may gradually diminish. Although recycling initiatives and advancements in battery technology seek to lower costs and the environmental impact of battery disposal, replacing batteries can be a substantial financial commitment.

- **Limited Model Variety:** While the assortment of electric vehicle (EV) models is expanding. There may still be fewer options available in terms of size, style, and features 5 c in contrast to conventional automobiles. Some consumers may find the current selection of EVs limiting, especially if they have specific preferences or requirements regarding vehicle size, range, or performance. However, as demand for EVs continues to grow, automakers are expanding their EV offerings to cater to a broader range of consumer preferences and market segments, leading to greater diversity and choice in the EV market over time.
- **Supply Chain Concerns:** Critical elements like lithium, cobalt, and rare earth metals are needed in the production of electric vehicles (EVs), raising questions

regarding the ethical and environmental effects of these resources' extraction and processing. Issues such as resource depletion, environmental degradation, and labour practices in mining regions raise ethical and sustainability concerns 15 for EV manufacturers and consumers alike. Efforts to address these supply chain challenges include increasing transparency and traceability in material sourcing, investing in recycling and reuse initiatives, and exploring alternative materials and technologies to reduce reliance on scarce or controversial resources.

- **Perceived Infrastructure Gaps:** Although the infrastructure for charging electric vehicles (EVs) is growing, some consumers may be hesitant to adopt EVs because of worries about the accessibility of charging stations Notwithstanding these drawbacks, continued technological developments and encouraging legislation are resolving many of these issues, which is boosting the global use of electric vehicles and the perceived inconvenience of charging as opposed to refuelling with gasoline. .Illusions regarding charging durations, range restrictions, and the availability of charging stations may discourage prospective electric vehicle purchasers from transitioning to electric transportation. Educating consumers about the expanding array of charging points, advancements in fast changing technology, and the overall convenience and benefits of EV ownership is crucial for dispelling myths and encouraging greater acceptance and adoption of electric vehicles. Additionally, continued investment in expanding and improving charging infrastructure will help address perceived gaps and enhance the EV ownership experience for consumers.

Despite these disadvantages, ongoing advancements in technology and supportive policies are addressing many of these challenges, contributing the growing adoption of electric vehicles worldwide.

ENVIRONMENTAL BENEFITS OF EV

- **Reduced Greenhouse Gas Emissions:** Electric automobiles produce lower or zero tailpipe emissions compared to traditional internal combustion engine vehicles. This is because EVs use electric motors powered by batteries, which don't burn fossil fuels directly. By avoiding the combustion of gasoline or diesel,

EVs help lessen air pollution and cut back on greenhouse gas emissions ike carbon dioxide (CO2), which contributes to climate change.

- **Improved Air Quality**: Since EVs eliminate tailpipe emissions, they contribute to better air quality. Traditional vehicles emit pollutants such as nitrogen oxides (NOx), particulate matter (PM), and volatile organic compounds (VOCs), which can harm human health and the environment. By transitioning to EVs, we can reduce these harmful emissions, leading to cleaner air and fewer health issues related to air pollution.
- **Lower Carbon Footprint:** Over their lifecycle, Electric vehicles typically possess a reduced carbon footprint compared to conventional vehicles, especially as the electricity grid becomes greener with the increased utilization of sustainable energy sources such as wind and solar power. While the production of EVs may initially involve higher emissions due to manufacturing processes and battery production, these emissions can be offset over time by the cleaner operation of EVs during their use phase.
- **Energy Efficiency:** Internal combustion engines are not as energy-efficient as electric motors by nature. They can power the car by converting a larger percentage of the energy stored in their batteries into mechanical energy, so wasting less energy as heat. By reducing waste and improving overall energy consumption, this increased energy efficiency contributes to the development of a more ecologically friendly transportation system.
- **Decreased Dependence on Fossil Fuels:** Electric vehicles (EVs) reduce reliance on finite fossil fuels like oil and natural gas by using electricity as their main energy source. By spreading out the energy sources utilized for transportation, this increases energy security and lessens the environmental damage caused by the extraction and burning of conventional fuels, such as habitat destruction and pollution of the air and water.

- **Encouragement of Renewable Energy Adoption:** The adoption of EVs can drive increased demand for renewable energy sources. As more EVs are deployed on the roads, there is a greater need for electricity to power them. This

can incentivize the transition to cleaner and more sustainable energy production, such as wind, solar, hydroelectric, and geothermal power. By promoting the uptake of renewable energy, EVs contribute to reducing greenhouse gas emissions and combating climate change.

- **Incentives for Sustainable Practices:** Governments and organizations often provide incentives to encourage the use of EVs as part of broader efforts to promote sustainability and combat climate change. These incentives may include tax credits, rebates, grants, or subsidies for purchasing EVs, as well as incentives for installing charging infrastructure and transitioning fleets to electric vehicles. By providing economic benefits to consumers and businesses that choose electric vehicles, these incentives help accelerate the adoption of EVs and contribute to reducing emissions from the transportation sector.
- **Promotion of Sustainable Transportation:** EVs play a crucial role in the broader shift towards sustainable transportation. By serving as a cleaner and more environmentally friendly alternative to traditional vehicles, EVs contribute to reducing the environmental impact of urban mobility. Additionally, the development of EV technology can spur innovation in other areas of transportation, such as public transit, shared mobility services, and active transportation modes like walking and cycling, leading to more sustainable and integrated transportation systems.

While EVs contribute positively to the environment, it's essential to consider the environmental impact of manufacturing and disposing of their batteries, as well as the energy sources used for electricity generation. Continued advancements in technology and the use of renewable energy can further enhance the environmental benefits of electric vehicles.

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

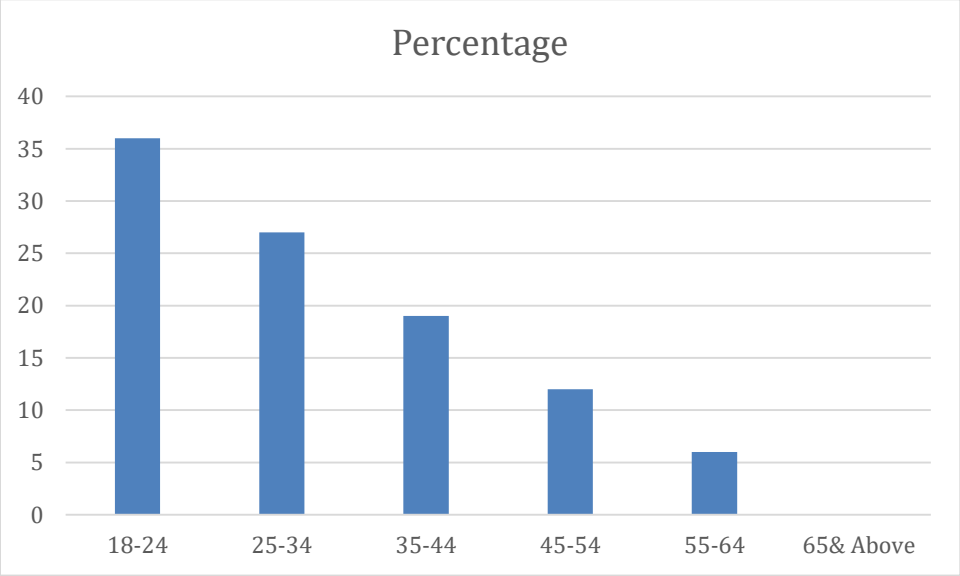
Table 4.1

Age wise classification of respondents

Age	No. of respondents	Percentage
18-24	36	36
25-34	27	27
35-44	19	19
45-54	12	12
55-64	6	6
65& Above	0	0
Total	100	100

Chart 4.1

Age wise classification of respondents



Interpretation:

Table 4.1 shows that 36% of the respondents are in age between 18-24, 27% of the respondents are in age between 25-34, 19% of the respondents are in age between 35-44, 12% of the respondents are in age between 45-54, and only 6% of the respondents are in age between 55-64.

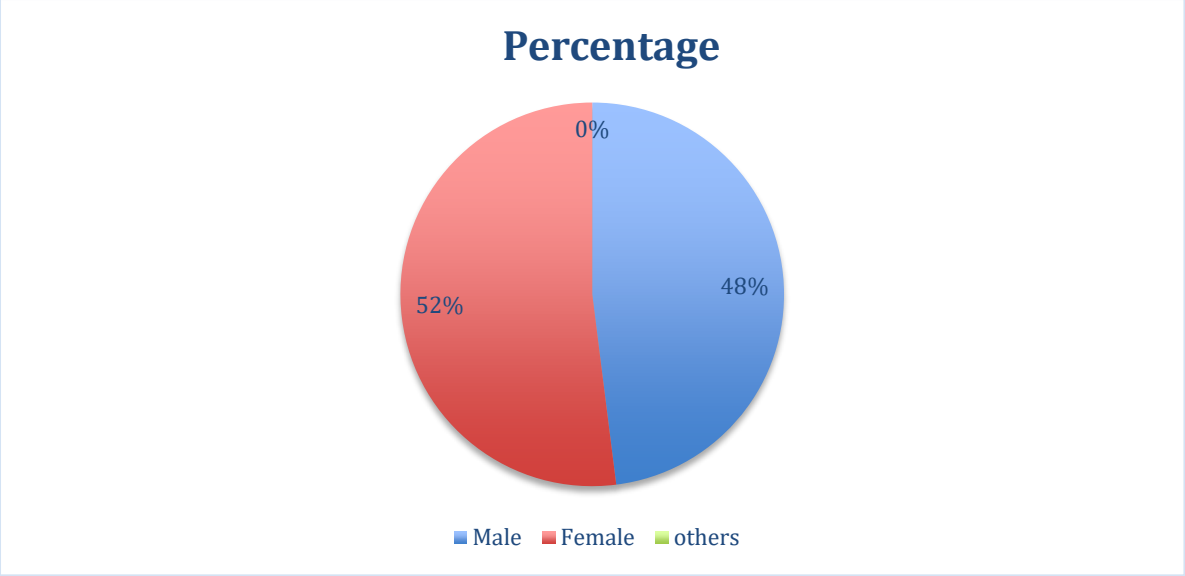
Table 4.2

Gender wise classification of respondents

Particulars	No. of respondents	Percentage
Male	48	48
Female	52	52
others	0	0

Chart 4.2

Gender wise classification of respondents



Interpretation:

Table 4.2 shows that 52% of the respondents are female and 48% of the respondents are male.

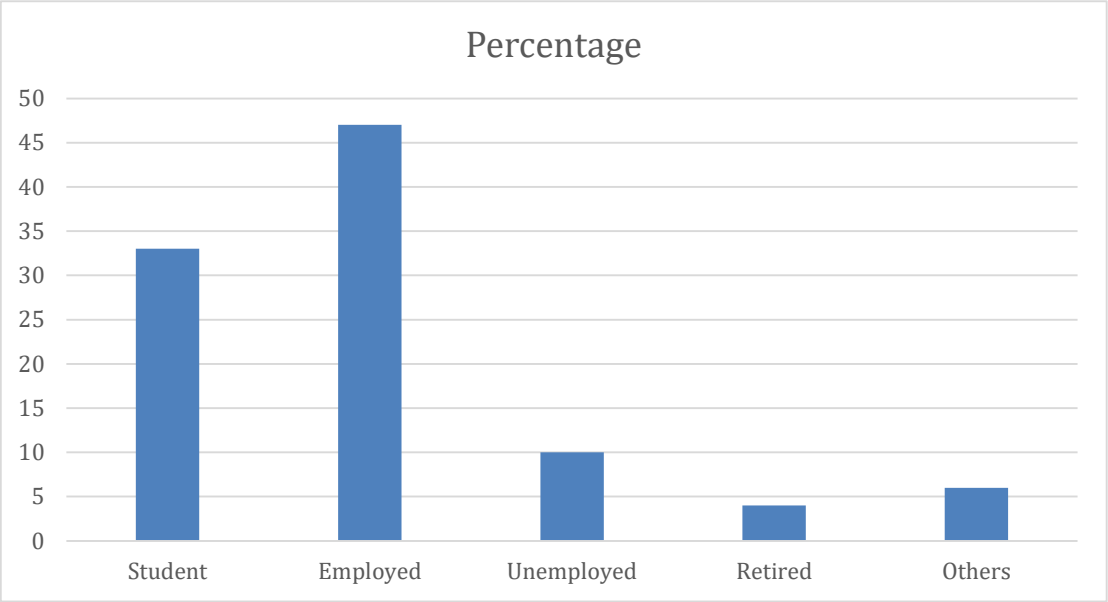
Table 4.3

Occupation

Particulars	No. of respondents	Percentage
Student	33	33
Employed	47	47
Unemployed	10	10
Retired	4	4
Others	6	6

Chart 4.3

Occupation



Interpretation:

Table 4.3 shows that 47% among the surveyed individuals are employed, 33% are students, 10% are unemployed, 6% are in others category and 4% are retired people.

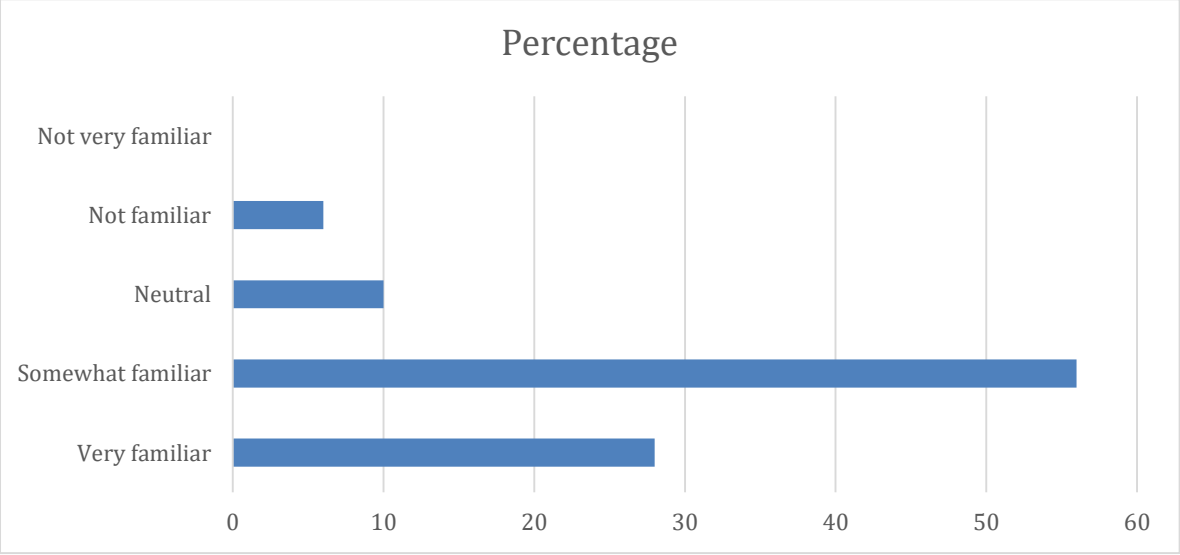
Table 4.4

Level of familiarity

Particulars	No. of respondents	Percentage
Very familiar	28	28
Somewhat familiar	56	56
Neutral	10	10
Not familiar	6	6
Not very familiar	0	0

Chart 4.4

Level of familiarity



Interpretation:

Table 4.4 shows that 56% among the participants a2 somewhat familiar about EV, 28% are very familiar, 10% are neutral, and 6% are not familiar with EV.

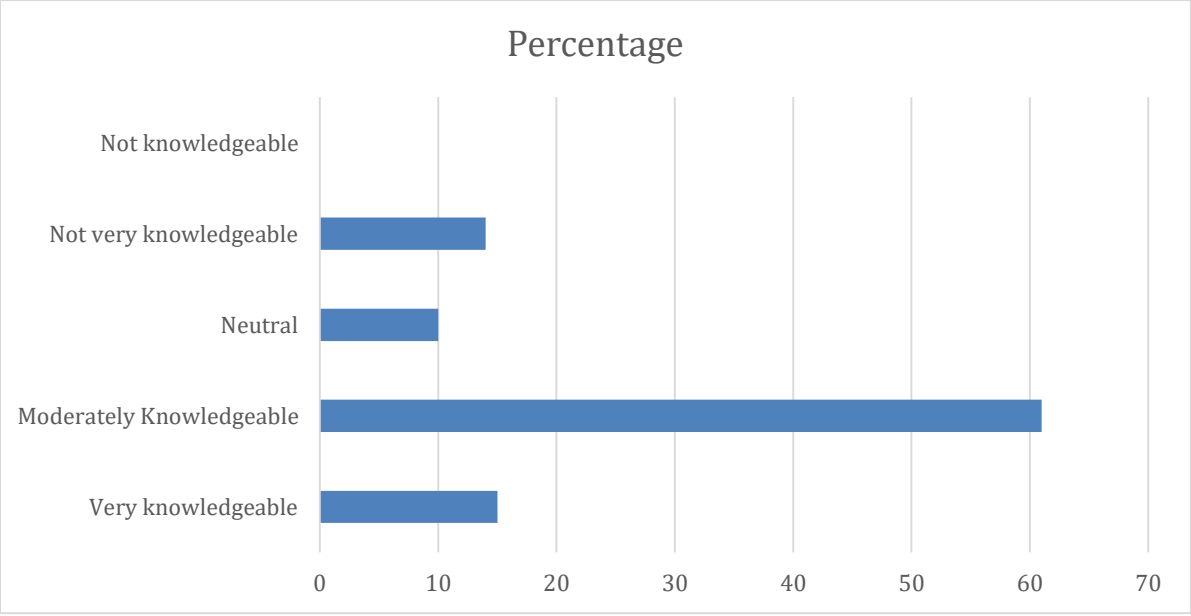
Table 4.5

Knowledge about working of EV

Particulars	No. of respondents	Percentage
Very knowledgeable	15	15
Moderately Knowledgeable	61	61
Neutral	10	10
Not very knowledgeable	14	14
Not knowledgeable	0	0

Chart 4.5

Knowledge about working of EV



Interpretation:

Table 4.5 shows that 61% of the respondents are moderately knowledgeable about working of EV, 15% are very knowledgeable, 14% are not very knowledgeable, and 10% are neutral.

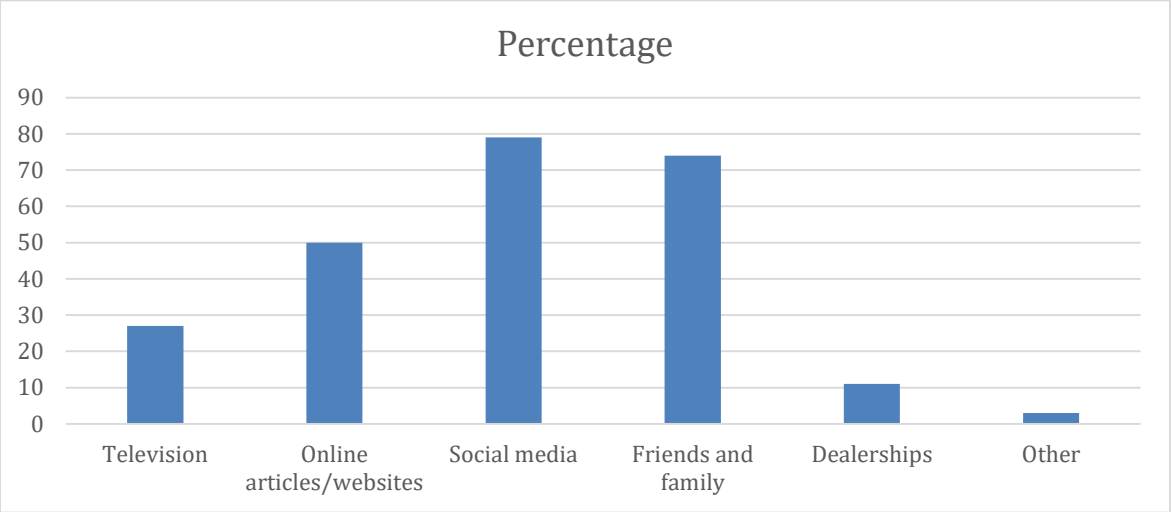
Table 4.6

Information about EV

Particulars	No. of respondents	Percentage
Television	27	27
Online articles/websites	50	50
Social media	79	79
Friends and family	74	74
Dealerships	11	11
Other	3	3

Chart 4.6

Information about EV



Interpretation:

Table 4.6 shows that 79% of the respondents depend on social media, 74% on friends and family, 50% on online articles/websites, 27% on television, 11% on dealerships, and only 3% on other.

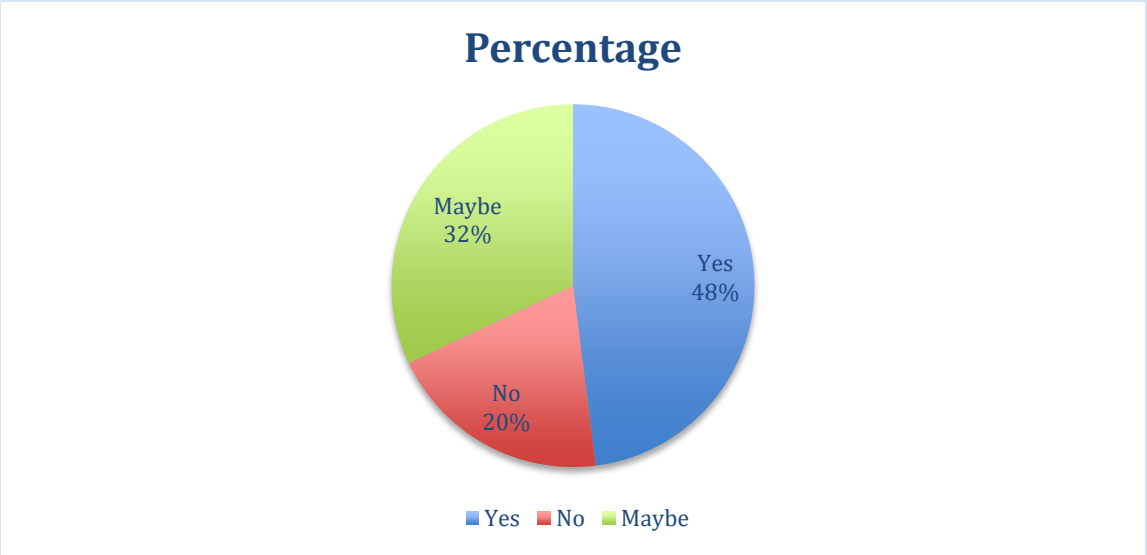
Table 4.7

Test driving to know features and performance

Particulars	No. of respondents	Percentage
Yes	48	48
No	20	20
Maybe	32	32

Chart 4.7

Test driving to know features and performance



Interpretation:

Table 4.7 shows that the 48% of participants believe that test driving assists in understanding features and performance, 32% are open to the idea ('maybe'), and 20% exhibit hesitancy.

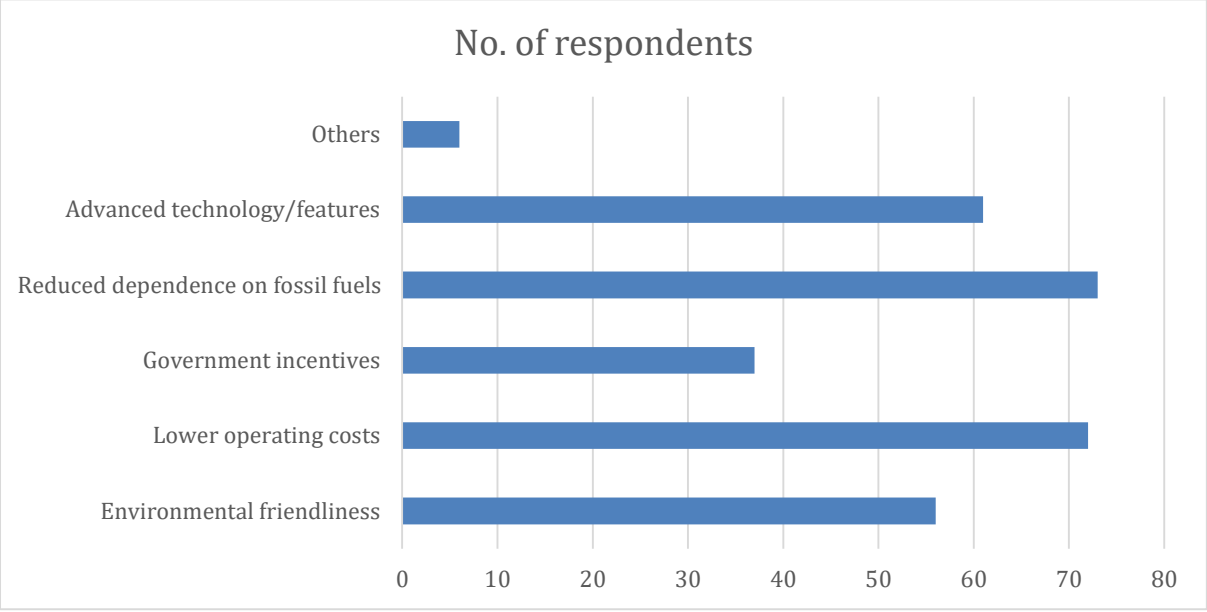
Table 4.8

Perceived benefits of EV

Particulars	No. of respondents	Percentage
Environmental friendliness	56	56
Lower operating costs	72	72
Government incentives	37	37
Reduced dependence on fossil fuels	73	73
Advanced technology/features	61	61
Others	6	6

Chart 4.8

Perceived benefits of EV



Interpretation:

Table 4.8 shows that 73% of respondents opined reduced reliance on fossil fuels as an advantage of electric vehicles, 72% of the respondents said as lower operating costs , 61% of the respondents said as advanced technology/feature, 56% of the respondents said as environmental friendliness, and 6% of the respondents said as others.

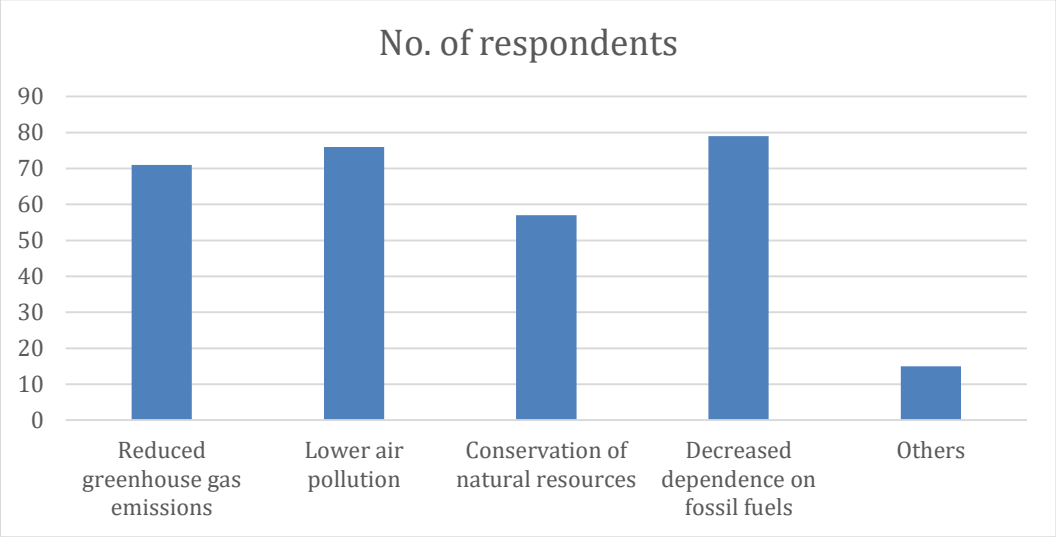
Table 4.9

Environmental Benefits of EV

Particulars	No. of respondents	Percentage
Reduced greenhouse gas emissions	71	71
Lower air pollution	76	76
Conservation of natural resources	57	57
Decreased dependence on fossil fuels	79	79
Others	15	15

Chart 4.9

Perceived benefits of EV



Interpretation:

Table 4.9 shows that 79% of the respondents opined the perceived benefit of EVs as decreased dependence on fossil fuels, 76% of the respondents opined as lower air pollution, 71% of the respondents opined as reduced greenhouse gas emissions, 57% of the respondents opined as conservation of natural resources, and 15% opined as others.

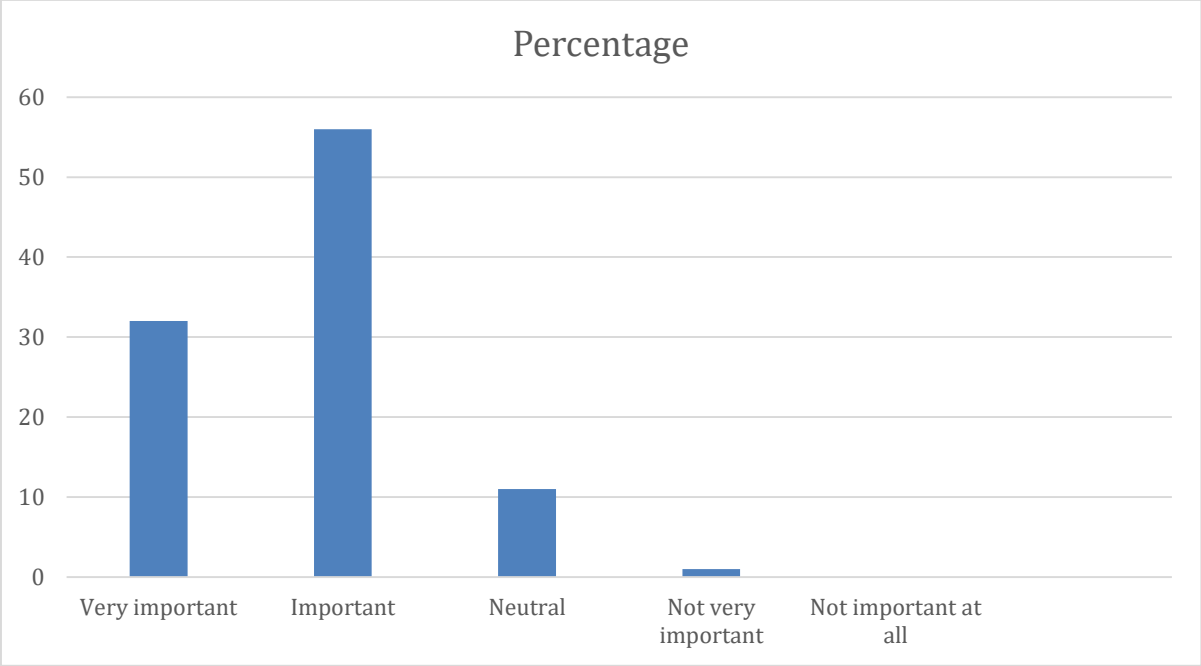
Table 4.10

Influence of Perceived Benefits

Particulars	No. of respondents	Percentage
Very important	32	32
Important	56	56
Neutral	11	11
Not very important	1	1
Not important at all	0	0

Chart 4.10

Influence of Perceived Benefits



Interpretation:

Table 4.10 shows that 56% of respondents consider influence of perceived benefits of EV important, 32% very important, 11% neutral, and only 1% not very important.

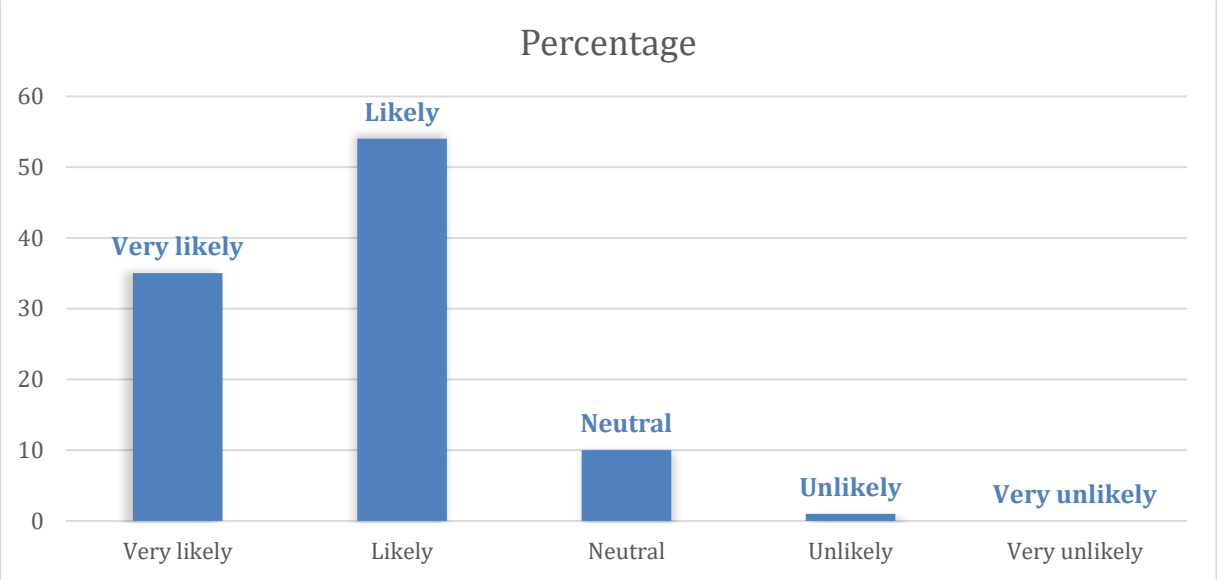
Table 4.11

Probability to recommend EV

Particulars	No. of respondents	Percentage
Very likely	35	35
Likely	54	54
Neutral	10	10
Unlikely	1	1
Very unlikely	0	0

Chart 4.11

Probability to recommend EV



Interpretation:

Table 4.11 shows that 54% of respondents are likely to recommend electric vehicles (EVs), 35% are very likely, 10% are neutral, and only 1% are unlikely to recommend them.

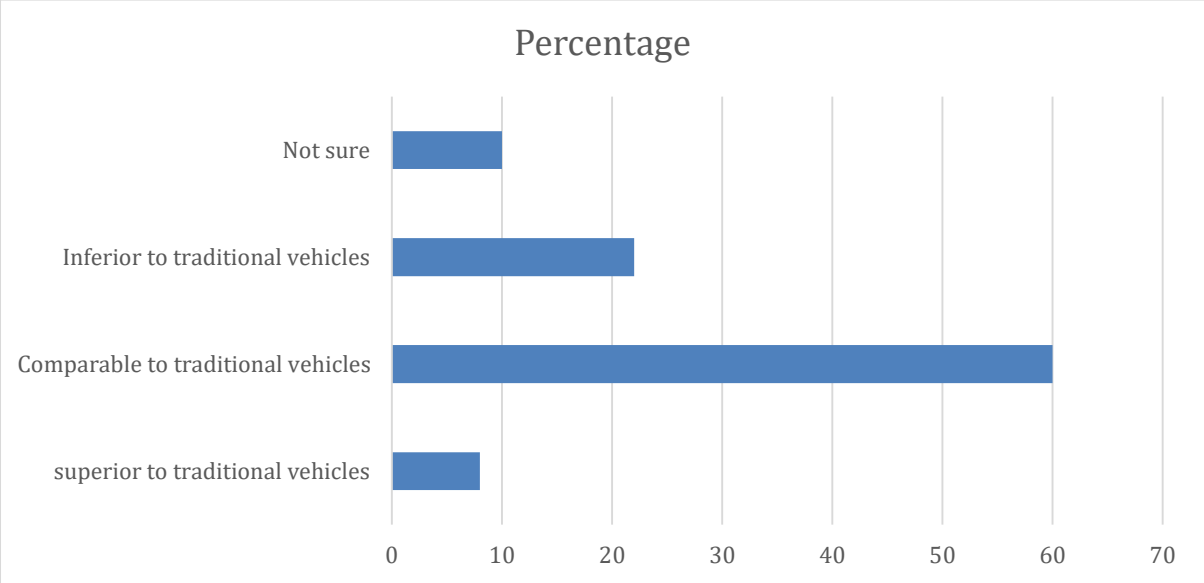
Table 4.12

Driving Experience of EV

Particulars	No. of respondents	Percentage
superior to traditional vehicles	8	8
Comparable to traditional vehicles	60	60
Inferior to traditional vehicles	22	22
Not sure	10	10

Chart 4.12

Driving Experience of EV



Interpretation:

Table 4.12 shows that 60% of respondents grade EV driving experience as comparable to that of traditional vehicles, 22% rated it as inferior, 10% were unsure, and only 8% rated it as superior.

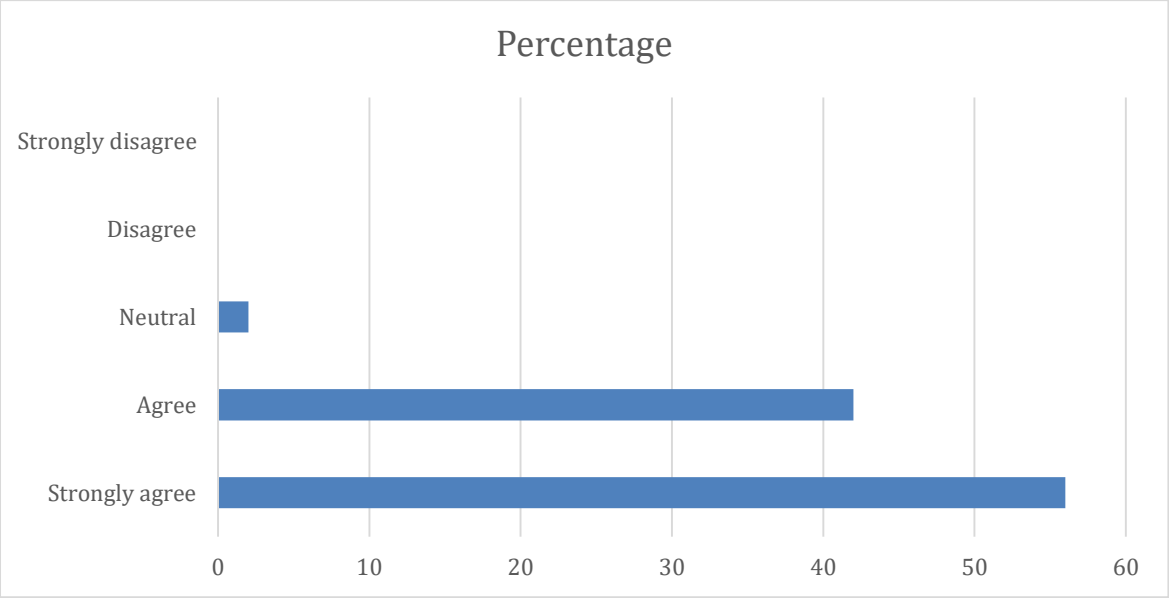
Table 4.13

Environmental Friendliness than traditional vehicles

Particulars	No. of respondents	Percentage
Strongly agree	56	56
Agree	42	42
Neutral	2	2
Disagree	0	0
Strongly disagree	0	0

Chart 4.13

Environmental Friendliness than traditional vehicles



Interpretation:

Table 4.13 shows that 56% of respondents strongly agree that EVs are more environmentally friendly than traditional vehicles, 42% agree, and 2% neither agree nor disagree.

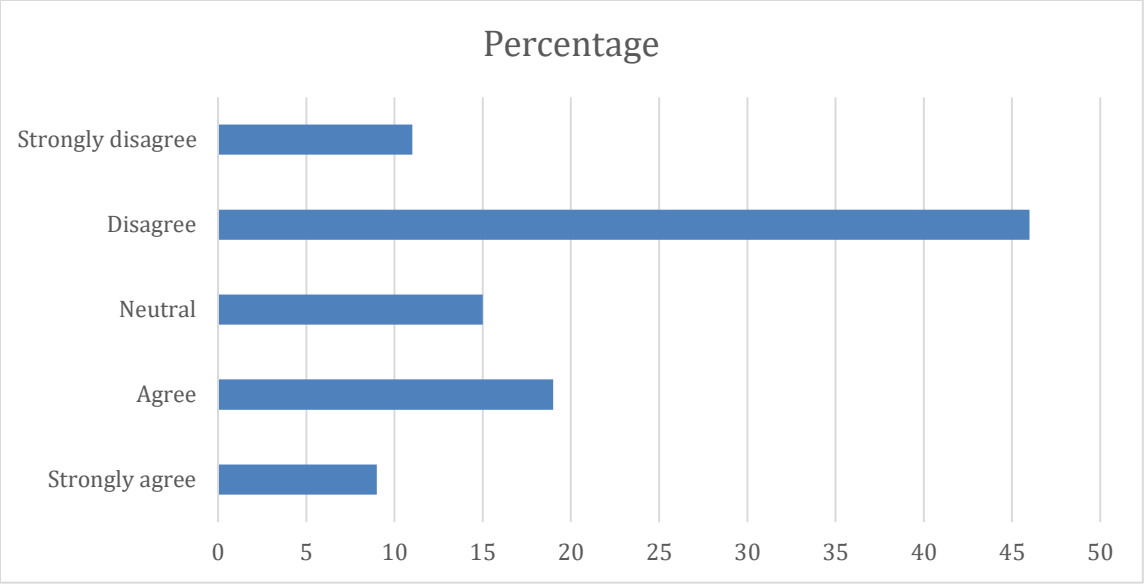
Table 4.14

Convenience and accessibility of Charging Infrastructure

Particulars	No. of respondents	Percentage
Strongly agree	9	9
Agree	19	19
Neutral	15	15
Disagree	46	46
Strongly disagree	11	11

Chart 4.14

Convenience and accessibility of Charging Infrastructure



Interpretation:

Table 4.14 shows that 46% of the respondents disagree with the convenience and charging infrastructure, 19% agree, 15% neutral, 11% strongly disagree, and only 9% strongly agree with it.

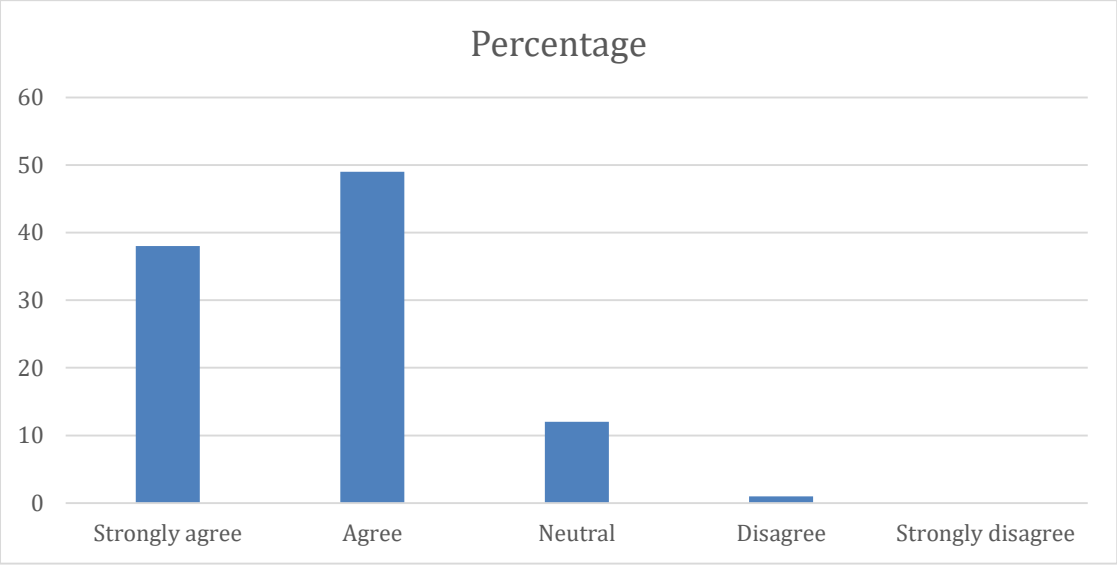
Table 4.15

Lower Maintenance Cost of EV

Particulars	No. of respondents	Percentage
Strongly agree	38	38
Agree	49	49
Neutral	12	12
Disagree	1	1
Strongly disagree	0	0

Chart 4.15

Lower Maintenance Cost of EV



Interpretation:

Table 4.15 shows that 49% of the respondents agree with the lower maintenance cost of EV, 38% strongly agree, 12% neither agree nor disagree, and 1% disagree with the statement.

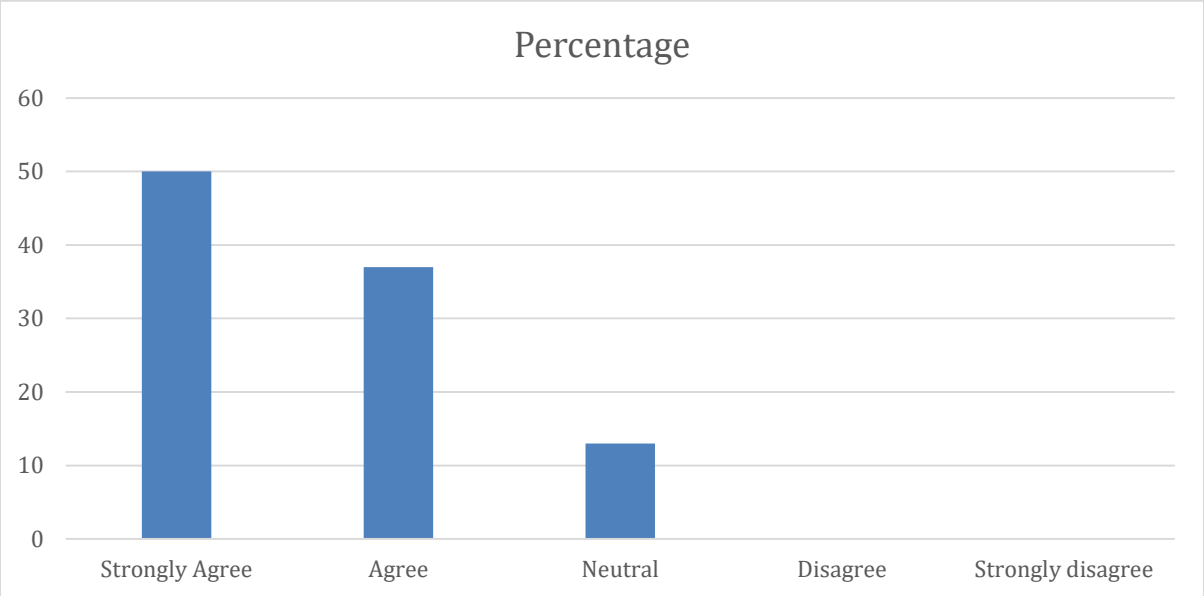
Table 4.16

Predominant mode in the future

Particulars	No. of respondents	Percentage
Strongly Agree	50	50
Agree	37	37
Neutral	13	13
Disagree	0	0
Strongly disagree	0	0

Chart 4.16

Predominant mode in the future



Interpretation:

Table 4.16 shows that 50% among those who have responded are strongly agree that EV would become prominent mode of transportation in the future, 37% agree, 13% neither agree nor disagree with the statement.

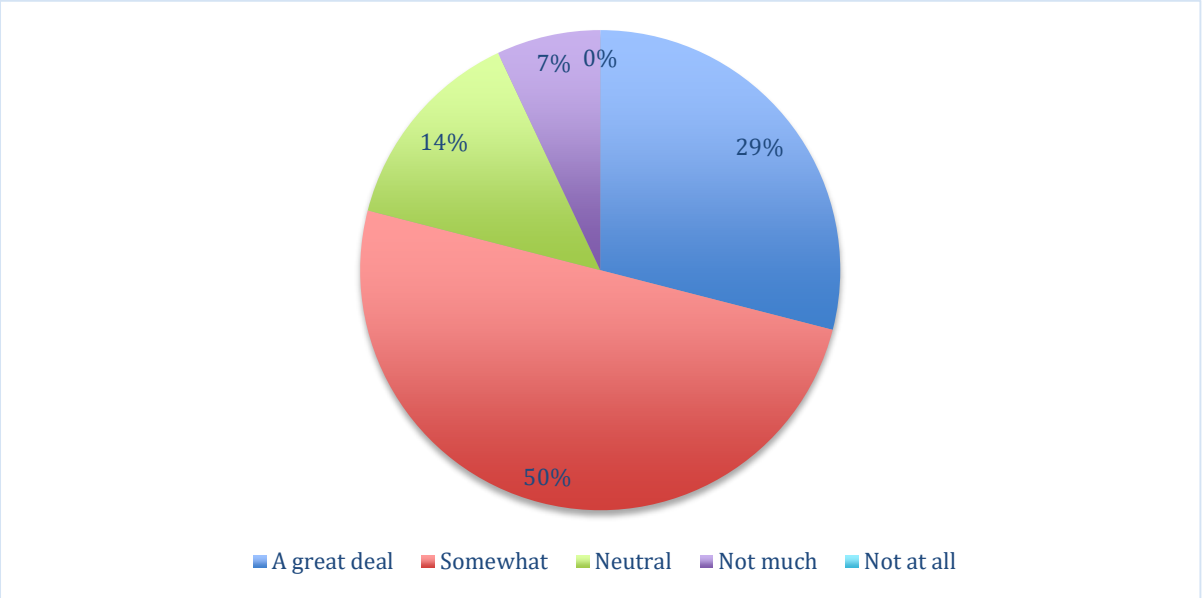
Table 4.17

Influence of Environmental friendliness

Particulars	No. of respondents	Percentage
A great deal	29	29
Somewhat	50	50
Neutral	14	14
Not much	7	7
Not at all	0	0

Chart 4.17

Influence of Environmental friendliness



Interpretation:

Table 4.17 shows that 50% of the respondents somewhat influenced by environmental friendliness, 29% by a great deal, 14% are neutral, 7% are not much influenced.

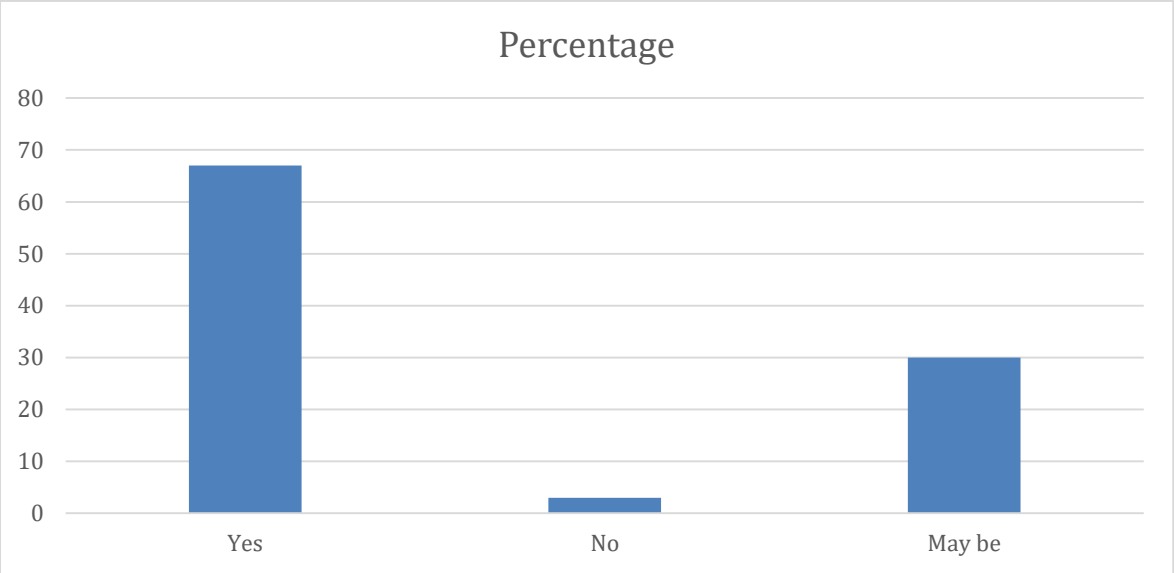
Table 4.18

EV Marketed as green

Particulars	Percentage	Percentage
Yes	67	67
No	3	3
May be	30	30

Chart 4.18

EV Marketed as green



Interpretation:

Table 4.18 shows that 67% of the respondents consider an electric car if it's marketed as eco-friendly, 30% are not sure, only 3% aren't interested.

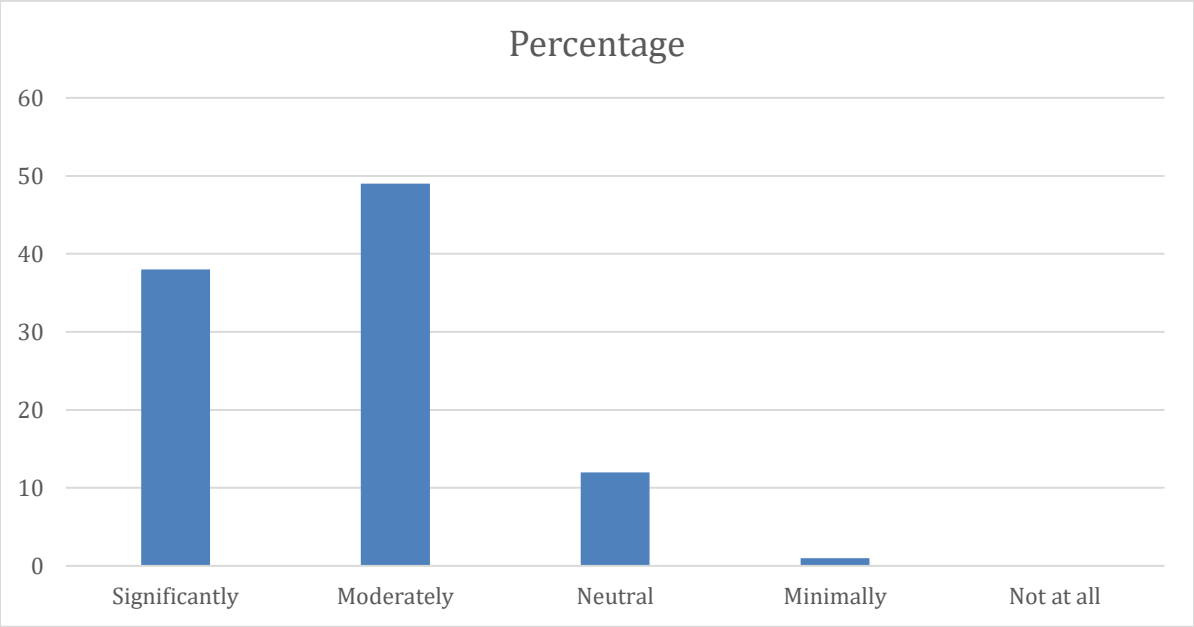
Table 4.19

Quality of Air

Particulars	No. of respondents	Percentage
Significantly	38	38
Moderately	49	49
Neutral	12	12
Minimally	1	1
Not at all	0	0

Chart 4.19

Quality of Air



Interpretation:

Table 4.19 shows that 49% of the respondents moderately believe electric vehicles positively impact air quality, 38% as significantly, 12% are neutral, and only 1% as minimally.

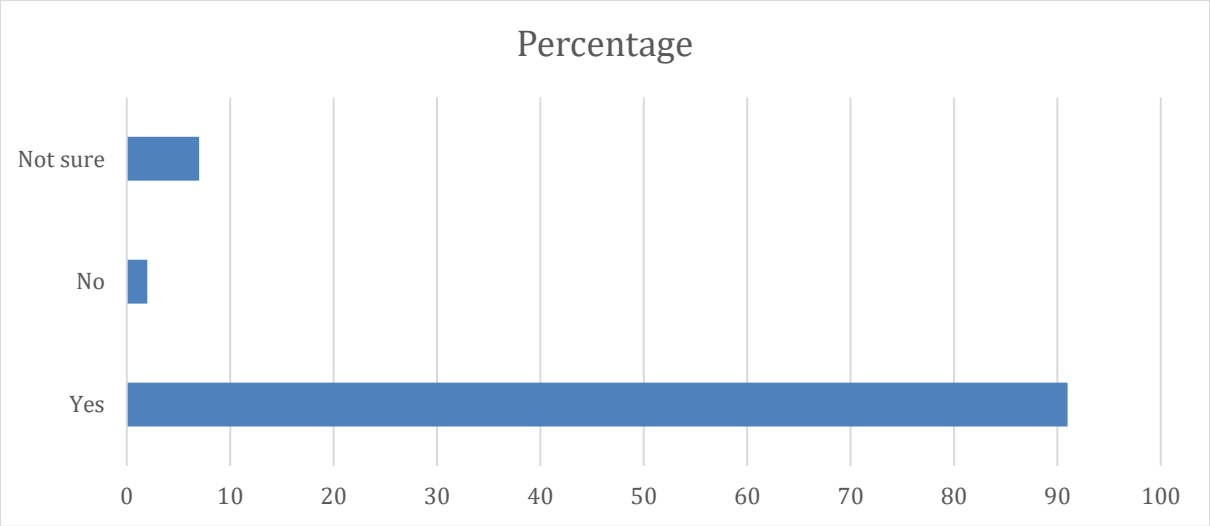
Table 4.20

Noise Pollution

Particulars	No. of respondents	Percentage
Yes	91	91
No	2	2
Not sure	7	7

Chart 4.20

Noise Pollution



Interpretation:

Table 4.20 shows that 91% of the respondents hold the belief that electric vehicles positively impact on reducing air pollution, 7% are not sure and 2% oppose it.

One Sample Test

H_{01}: There is no significant difference in the level of awareness among consumers regarding electric vehicles.

Table 4.21

Descriptives of level of awareness of consumers regarding electric vehicles

	N	Mean	Median	SD	SE
Level of awareness	100	3.98	4.00	0.588	0.0588

Interpretation:

From the table, it is clear that most people have a good awareness of electric vehicles, with a score of 3.98.

Table 4.22

One Sample T-Test

		Statistic	df	p	Mean difference
Level of awareness	Student's t	16.6	99.0	< .001	0.975

Note. H_a $\mu \neq 3$

Interpretation:

The one sample T-test shows that there is statistically significant difference between mean level of awareness (3.98) and the hypothesized population mean of 3.Threfore the null hypothesis of the test is rejected and it can be concluded that the mean level of awareness regarding Electric Vehicles is significantly higher than the average level of awareness.

One sample T test

H_{02}: There is no significant difference between the average level of perceived benefits of electric vehicles among consumers and the specified benchmark value.

Table 4.23

Descriptives of level of perceived benefits of electric vehicles among consumers

	N	Mean	Median	SD	SE
Perceived Benefits	100	4.21	4.50	0.542	0.0542

Interpretation:

From the table it is clear that consumers of electric vehicles are perceiving a better level of benefits, with a score of 4.21.

Table 4.24

One Sample T-Test

		Statistic	df	p	Mean difference
Perceived Benefits	Student's t	22.3	99.0	< .001	1.21

Note. H_a $\mu \neq 3$

Interpretation:

The one sample T-test shows that there is statistically significant difference between mean level of perceived benefits among consumers of electric vehicles is 4.21 and the hypothesized population mean of 3.Therefore the null hypothesis of the test is rejected and it can be concluded that the mean level of perceived benefits of among consumers regarding Electric Vehicles is significantly higher than the average level of perceived benefits.

Linear Regression

H_{03}: There is no significant influence of perceived benefits of electric vehicles on consumers' overall perception of electric vehicles.

Table 4.25

Model Fit Measures

			Overall Model Test			
Model	**R**	**R^2**	**F**	**df1**	**df2**	**p**
1	0.263	0.0690	7.27	1	98	0.008

Interpretation:

The null hypothesis says that how people view electric vehicles isn't influenced by their benefits. But the model test shows that 6.9% of the overall opinion can be explained by these benefits. And with a p-value of 0.008, this influence is important.

Table 4.26

Model Coefficients - Perception of consumers

Predictor	**Estimate**	**SE**	**t**	**p**
Intercept	3.097	0.3228	9.59	< .001
Perceived Benefits	0.205	0.0761	2.70	0.008

Interpretation:

The null hypothesis implies perceived benefits of electric cars don't affect overall opinion. From this table each unit rise in perceived benefits increases overall perception by 0.205 units. A p-value of 0.008 suggests a significant impact on consumers' overall view of electric vehicles.

CHAPTER V

FINDINGS, SUGGESTIONS AND CONCLUSION

FINDINGS

- Major part of the population comes under the age group 18-24 years
- 52% of the respondents are male and 48% are female.
- 3.47% of the respondents are employed and 33% are students.
- Majority of the respondents (56%) somewhat familiar with the Electric Vehicles
- Majority of the respondents (61%) moderately knowledgeable about the working of Electric vehicles.
- The majority of those surveyed (79%) usually get information from the social media.
- Most of those surveyed (48%) test driving an EV helps to learn about features and performance.
- Most of the respondents (73%) view reduced dependency on fossil fuels as the primary benefit of electric vehicles.
- Most of the respondents (79%) considers decreased dependency on fossil fuels as the main environmental benefit of EV.
- Majority of the respondents (54%) are likely to recommend EV to their friends and families.
- Most of the respondents (60%) opinion that driving experience of EV is comparable to traditional vehicles.
- Majority of the respondents (56%) strongly agree that Electric vehicles are environmentally friendly than traditional vehicles.
- Most of the respondents (46%) disagree with the convenience of charging infrastructure of EVs.
- Majority of the respondents (49%) agree with the lower maintenance cost of EVs.

- Most of the respondents (50%) strongly agree that Electric Vehicle will become predominant mode of transportation in the future.
- Majority of the respondents (50%) are somewhat influenced by the environmental friendliness on the perception of EV.
- Most of the respondents (60%) opinion that they would be more inclined to consider an EV if it were marketed as ‘green’.
- Majority of the respondents (49%) opinion that electric vehicles positively impact the quality of air we breathe.
- Majority of the respondents (91%) opinion that electric vehicles have a positive impact on reducing traffic noise pollution.

SUGGESTION

The project “Consumer perception on Electric Vehicles” has provided valuable insights regarding consumer’s perceptions towards EV

1. Target younger consumers with direct advertising efforts that emphasize the advantages of electric vehicles and their applicability to modern lifestyles through social media channels.

2 Create educational initiatives aimed at increasing students' understanding and awareness of electric vehicles, mostly through curriculum development and educational seminars.

3. Enhance the accessibility and convenience of electric vehicle charging infrastructure by expanding and improving charging stations in public areas, residential complexes, and workplaces, thereby addressing concerns about the availability of charging facilities.

4. Highlight the positive impact of electric vehicles on the environment, emphasizing their role in reducing greenhouse gas emissions and air pollution, and preserving natural resources for future generations.

5. Promote the economic advantages of electric vehicles, emphasizing their lower maintenance costs compared to traditional vehicles, which can lead to significant long-term savings for consumers.

CONCLUSION

The research indicates significant interest in electric vehicles (EVs) among 18-24-year-olds, with balanced male-female representation. Both students and employed individuals show interest, suggesting broad appeal. Social media is crucial for EV information dissemination, necessitating targeted marketing strategies. EVs are preferred for environmental benefits despite concerns about charging infrastructure and maintenance costs. Positive attitudes towards EVs, including their potential as the main mode of transportation, indicate a promising future. Effective marketing emphasizing green attributes can drive adoption. Understanding consumer preferences is vital for shaping the EV industry's development. Addressing challenges and leveraging interest can accelerate the transition to a sustainable transportation ecosystem powered by EVs.

APPENDIX

QUESTIONNAIRE

CONSUMER PERCEPTION ON ELECTRIC VEHICLES

1. Age

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 &Above

2. Gender

- Student
- Employed
- Unemployed
- Retired
- Other

3. How familiar are you with electric vehicles (EVs)?

- Very familiar
- Somewhat familiar
- Neutral
- Not familiar
- Not very familiar

4. Which of the following best describes your understanding of how electric vehicles work?

- Very knowledgeable
- Moderately knowledgeable

- Neutral
- Not very knowledgeable
- Not knowledgeable at all

5. Where do you usually get information about electric vehicles?(Select All that apply)

- Television
- Online articles/websites
- Social media
- Friends and family
- Dealerships
- Other

6. Would you consider test driving an electric vehicle to learn more about its features and performance?

- Yes
- No
- May be

7. What do you perceive as the primary benefits of electric vehicles? (Select up to three)

- Environmental friendliness
- Lower operating costs
- Government incentives
- Reduced dependence on fossil fuels
- Advanced technology/features
- Others

8. What environmental benefits do you believe electric vehicles offer? (Select all that apply)

- Reduced greenhouse gas emissions
- Lower air pollution
- Conservation of natural resources

- Decreased dependence on fossil fuels
- Others

9. How important are these perceived benefits in influencing your opinion about electric vehicles?

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

10. How likely are you to recommend electric vehicles to friends or family based on their perceived benefits?

- Very likely
- Likely
- Neutral
- Unlikely
- Very unlikely

11. How do you perceive the driving experience of electric vehicles in terms of acceleration and performance?

- Superior to traditional vehicles
- Comparable to traditional vehicles
- Inferior to traditional vehicles
- Not sure

12.

	Strongly disagree	Disagree	Disagree	Agree	Strongly agree
1. Electric vehicles are more environmentally					

friendly than traditional gasoline-powered vehicles.					
2. The charging infrastructure for electric vehicles is convenient and accessible.					
3. Electric vehicles have lower maintenance cost compared to traditional vehicles					
4. I believe that electric vehicles become the predominant mode of transportation in the future					

13. To what extent does the environmental friendliness of electric vehicles influence your perception of them?

- A great deal
- Somewhat
- Neutral
- Not much
- Not at all

14. Would you be more inclined to consider an electric vehicle if it were marketed as a "green" or environmentally friendly option?

- Yes

- No
- Maybe

15. To what extent do you think electric vehicles positively impact the quality of the air we breathe?

- Significantly
- Moderately
- Neutral
- Minimally
- Not at all

16. Do you think electric vehicles have a positive impact on reducing traffic noise pollution?

- Yes
- No
- Maybe

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