"GREEN DRIVING: DECODING CUSTOMER ATTITUDES TOWARDS ELECTRIC MOBILITY WITH SPECIAL REFERNCE TO ERNAKULAM DISTRICT"

Dissertation

Submitted by

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Under the guidance of

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Assistant Professor

In partial fulfillment of the requirement for the Degree of

MASTER OF COMMERCE

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ST. TERESA'S COLLEGE (AUTONOMOUS), ERNAKULAM

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This is to certify that the project entitled **"GREEN DRIVING: DECODING CUSTOMER ATTITUDES TOWARDS ELECTRIC MOBILITY WITH SPECIAL REFERNCE TO ERNAKULAM DISTRICT"** submitted to Mahatma Gandhi University in partial fulfillment of the requirement for the award of Degree in Master of Commerce is a record of original work done by ANN TERESA A.L under my supervision and guidance during the academic year 2024-25

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I Ms. Ann Teresa A.L, final year M.com student (Finance), Department of Commerce (SF), St. Teresa's College (Autonomous) do hereby declare that the project report entitled "GREEN DRIVING: DECODING CUSTOMER ATTITUDES TOWARDS ELECTRIC MOBILITY WITH SPECIAL REFERENCE TO ERNAKULAM DISTRICT" submitted to Mahatma Gandhi University is a bonafied record of the work done under the supervision and guidance of Smt. Jini Justin D'Costa, Assistant Professor of Department of Commerce (SF), St. Teresa's College (Autonomous) and this work has not previously formed the basis for the award of any academic qualification, fellowship or other similar title of any other university or board.

ANN TERESA A.L

PLACE: Ernakulam

DATE: 25/04/2025

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ANN TERESA A.L

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Electric vehicles are powered wholly or partly by electric motors that utilize electricity stored in batteries. In contrast to traditional internal combustion engine vehicles that depend on gasoline or diesel, electric vehicles convert electrical energy into mechanical energy to drive the wheels.

The shift from conventional internal combustion engine vehicles to electric vehicles is one of the most important developments in the automotive industry in 21st century. With growing global concerns about climate change, air pollution and energy sustainability the adoption of electric vehicles has become a practical solution for lowering greenhouse gas emissions and decreasing dependence on fossil fuels.

Electric vehicles are a milestone in transport evolution, embodying the movement towards sustainability, environmental stewardship and sophisticated technology. The world's automotive sector is the process of being radically transformed as governments, manufacturers and customers more and more seek to curtail fossil fuel reliance, maximize energy efficiency and neutralize ecological harm. The shift from traditional fuel engines to electric drive systems has picked up pace with the help of favourable policies, fast developments in battery technology and increased environmental awareness.

Aside from their zero tailpipe emissions, the environmental advantages of EVs become increasingly relevant when charged with renewable energy sources such as solar, wind or hydropower. As nations increasingly integrate renewable energy into their grids, the overall carbon footprint of EVs reduces further solidifying their contribution to global climate targets such as the Paris Agreement. Battery technology has been experiencing exceptional breakthroughs, especially in lithium-ion batteries that have high energy density, light in weight and long lasting. Scientists are constantly experimenting with new battery materials to address issues of range anxiety, charging time and battery degradation. From an economic point of view, the initial expensive nature of EVs previously held back their mass usage, but with reducing battery costs fuelled by advancing technology and volume production, they have become increasingly affordable. Consumers are encouraged by government rebates, tax exemptions and subsidies to adopt EVs, while reduced maintenance and fuel costs make them highly desirable. Increasing charging facilities, both public and home charging has further enhanced the convenience of EVs. Although, urban-rural access disparities continue to pose a challenge.

In spite of these developments, the shift to EVs is not without challenges. The environmental footprint of extracting raw materials such as lithium, cobalt and nickel poses ethical questions about resource depletion and environmental damage. Managing the disposal and recycling of EV batteries is also crucial in order to maintain a sustainable life cycle. Furthermore, consumer attitudes are also pivotal in determining the future of EV uptake. The early adopters are generally driven by environmental

awareness and technology curiosity, whereas mainstream consumers consider cost, convenience and performance.

States such as Kerala established their electric vehicle policy in 2019. The state government has introduced specific subsidies and incentives to encourage the adoption of electric vehicles in Kerala. According to the economic survey of 2024 which was released by the government, 8.95 lakh electric vehicles received subsidy under the FAME-II scheme in the fiscal ended March 31, 2024. That includes 8.04 lakh electric two-wheelers, 76,200 electric three-wheelers, and 12,400 electric cars.

The improvements in battery technology and charging infrastructure are quickly boosting the performance, range and accessibility of electric vehicles, making them more attractive to the customers. With the growing market of EVs, as big manufacturers increase investment in research and development, the course towards a greener and cleaner transportation future seems increasingly within reach.

This research paper also seeks to explore the various impacts of electric vehicles, emphasizing their environmental benefits, technological advancements, customer preferences and the challenges related to widespread adoption.

1.2 STATEMENT OF THE PROBLEM

The study is about the perception of customers towards electric vehicles and is concentrated on the people living in Ernakulam city. This research paper also seeks to explore the various impacts of electric vehicles, emphasizing their environmental benefits, technological advancements, the challenges related to widespread adoption and factors for the rapid growth in its sales sector.

1.3 SCOPE OF THE STUDY

This study mainly focuses on the perception of customers towards electric vehicles in Ernakulam city. As the electric vehicle industry experiences growth annually, researchers are having great opportunities to investigate the sector and understand consumer behaviour. They will have access to the market data from government sources as well as from consumers. This expansion is beneficial for the researchers to collect even more primary and secondary data.

1.4 OBJECTIVES OF THE STUDY

- To study the perception of customers towards electric vehicles
- To study the factors that influence customers to Purchase E-Vehicles
- To analyze the reasons for the significant increase in the purchase of electric vehicles
- To study the factors restricting customers from purchasing electric vehicles

1.5 RESEARCH METHODOLOGY

1.5.1 Research design

Here we utilize descriptive design for the study. The sample is collected from individuals residing in Ernakulam and they are selected using convenience & purposive sampling methods. The data for the study are collected through structured questionnaire.

1.5.2 Sample design and Size

The study mainly focuses on the current e-vehicle users and the potential buyers of e-vehicle. The sample is collected from 104 individuals residing in Ernakulam City.

1.5.3 Collection of data

The primary data is collected by using questionnaire through Google form. This facilitates real-time response monitoring and ensures smooth analysis.

Secondary data is collected through internet websites, journals and publications.

1.5.4 Research instruments for Data collection and analysis

For analyzing the data collected and to draw conclusions statistical tools like, simple percentage calculations and graphs are applied.

1.6 LIMITATION OF THE STUDY

- The EV market is rapidly evolving, with emerging technologies and policies, which can quickly render research findings outdated and impact their relevance.
- The accuracy of the research could be affected by biases in participants, as some may not be completely honest or might change their opinions based on different influences, resulting in biased results.

1.7 CHAPTER OUTLINE

This research has been presented in five chapters. Each part of the study has a significant role in the completion of study. Here are the chapter segregation followed for the study.

1.7.1 Introduction

1.7.2 Review of literature

1.7.3 Theoretical framework

1.7.4 Data analysis and interpretation

1.7.5 Findings, Suggestions and conclusion

CHAPTER 2

REVIEW OF LITERATURE

A review of literature is a written summary of major works and other materials on a certain subject. Scholarly journal articles, books, government reports, websites and other sources may be used in the review. It is typically included as separate portion of a graduate thesis or dissertation.

2.1 Omkar Tupe, Prof. Shweta Kishore and Dr.Arloph John Vieira (2020)

Consumers perception of electric vehicles in India: The researchers note that the government has initiated efforts to combat the depletion of fossil fuels by promoting the transition to electric energy.

2.2 Ankit Nagpal (2020)

Consumer's perception of electric vehicles in India: The researcher observes that, to effectively reduce pollution and carbon emissions, EV's need to become a common mode of transport nationwide. The literature shows that many factors contribute to the decision between electric and conventional vehicles. These are cost, range charging facilities, environmental concerns and performance. They have drawbacks such as limited range, high purchase price and low service centres. The future of the automobile industry relies on consumer choice, technological advancements and government policies for green transport.

2.3 Yogesh Aggrawal, Vivek Gedda and Kushan Parikh

Scooter riders who often cover short distances might find it simpler to adopt an electric two-wheeler. Yet for those who ride long distances regularly and own motorbikes such as the Hero Splendor, it might be tougher to adopt an electric two-wheeler. While boosting the fuel tank capacity helps lengthen the mileage of conventional vehicles, it is not simple to increase the battery capacity of electric vehicles. Each additional kWh adds around 30km of range but also increases the bike's weight by about 10kg, leading to a 10% rise in total weight. This weight increase is especially problematic for smaller bikes (under 150cc).

2.4 Neumann et al (2010)

The researcher discusses the rise in CO2 emissions and the depletion of fossil fuel reserves highlight the rollout of EV's as a crucial safety measure and a means of ensuring future security. The technology behind upcoming EVs is well-developed, resulting in greater efficiency, comfort and longer driving ranges.

2.5 Hoyer (2008)

Electric vehicle technology has been around for over a century, but the widespread use of combustion engines delayed its adoption. Today, several factors are rekindling interest in electric vehicles. On the pushing side, limited oil supplies and growing awareness of the environmental impact of traditional combustion engines are driving the shift toward cleaner alternatives. On the pulling side, advancements in battery technology and electric motors have made electric vehicles a strong competitor to conventional cars.

2.6 Enough Bhalla (2018)

The study “Consumer Perception and Purchase Intention of Electric Vehicles” by Enough Bhalla, Inass Salamah Ali and Afroze Nazneen examines the factors influencing vehicle choices including environmental concerns, cost, comfort, trust, technology, social acceptance and availability. These factors were assessed for both conventional and electric vehicles. The authors recommend that governments and EV makers place their focus on improving infrastructure and technology to improve public approval and confidence in electric vehicles. The research also identifies a growing consciousness of the ecological benefits of electric vehicles, calling for more investment in EV manufacturing and allied activities.

2.7 Pritam K Gujarathi (2018)

A market study of electric vehicles in India by Varsha A. Shah, Makarand M. Lokhande and Pritam K. Gujarati highlights the unique nature of the Indian market, electric and plug-in hybrid vehicles currently make up on 0.01% of the entire market share, The overwhelming majority of vehicles are still running on fossil fuels, which heavily contribute to greenhouse gas emissions and global warming. Besides, domestic oil production in India is inadequate to meet its requirements, leaving it with an annual requirement of approximately 70 million barrels. Consequently, it is crucial to explore the factors driving sustainable and cleaner development in the transportation sector.

2.8 Mohamed M (2018)

A study on the opportunities and challenges for electric vehicles in India by Mohammed M, G Tamil Arasan and G Sivakumar highlights that replacing internal combustion engines (ICE) with electric vehicles will significantly reduce pollution and benefit consumers. This technology has been successfully adopted by various countries, enhancing the overall landscape. The researchers examined the opportunities and challenges on adopting EVs in India, with a focus on policies, technology, planning and environmental impacts. The major challenges are high prices, inefficiency and low demand. Encouraging EVs is to minimize oil costs and reduce greenhouse gas emissions.

The government needs to utilize existing opportunities and come up with strategies to overcome these challenges.

2.9 Philippe Lebeau (2015)

In "Conventional, Hybrid or Electric vehicles: Which Technology for a Civic Distribution Centre?" Philippe Lebeau, Cedric De Cauwer, Joeri Van Mierlo and Cathy Macharis examine the significant impact of freight transport on urban mobility. The researchers explored the potential integration of electric vehicles in urban logistics operations, noting that various technologies can help reduce last-mile delivery costs. They introduced a model for vehicle routing with time windows specifically for EVs, emphasizing the importance of considering the variability in EV range. For smaller vans, EVs often emerge as the most cost-effective option. However, for larger vans, diesel vehicles currently demonstrate a more favourable financial outcome, as electric vehicles would need to travel longer distances to be economically competitive. Hybrid vehicles tend to be preferred in many scenarios due to their lower operating and fixed costs compared to diesel trucks.

2.10 Vijayagopal (2018)

His study developed an integrated model to identify the factors influencing consumer attitudes towards electric vehicles. It is based on the hypothesized perceptions held by current electric vehicle owners, which may differ from those of individuals without EV experience and how these perceptions relate to their self-image regarding electric vehicle ownership. The research posits that both product user self-image congruence (SIC) and negative stereotypes significantly impact SIC for product users and positively influence stereotypes, directly affecting consumer attitudes. The study examined the relationships between these factors and the correlation between attitude and purchase intention. The model was analysed before and after participants engaged in a simulation where they took on the role of an electric vehicle driver.

2.11 Bodin (2015)

In their 2015 work, "Advances in Consumer Electric Vehicle Adoption," Rezvani, Jansson and Bodin offer an overview of research on EV adoption, focusing primarily on specific psychological factors that influence individual's willingness to adopt electric vehicles. However, they reference only a limited selection of studies.

2.12 Lingzhi Jin (2017)

According to the International Council on Clean Transportation, as noted by Linghi Jin and Peter Slowik, the early growth of electric vehicle market continues. However, several barriers hinder their widespread adoption. These barriers include the high costs associated with new technology, concerns

about range & charging times and consumer awareness regarding the availability and feasibility of the technology.

2.13 Gusto P.K (2013)

In the work by Praveen Kumar and Kalyan Gusto on the "Implied Necessity for Electric Vehicles charging infrastructure and its Limitations for the Indian market", it is suggested that India should focus on small-scale solutions to tackle local freight challenges rather than implementing sweeping changes. Promoting home charging is essential. Before establishing a large-scale charging infrastructure, careful consideration of the area's layout, population density, business activity and safety is crucial. Integrating policies across the energy and transportation sectors is also vital. Additionally, to stimulate demand, growth initiatives could include financial incentives for electric bus drivers, such as tax credits, purchase subsidies, reduced fees free parking and access to designated lanes.

2.14 Fanchao Liao (2017)

Fanchao Liao, Eric Molin and Bert van Wee argue that electric vehicles can reduce pollution, global warming and oil dependence. However, despite government support, EV adoption is still low. To help policymakers and researchers, the authors reviewed research investigating consumer preference for electric vehicles, taking both economic and psychological considerations into account. The key factors that shape the adoption of EVs are purchase price, running costs, driving range, charging time, vehicle performance and brand choices. The availability of charging stations is also an important factor for the expansion of the EV market. Incentive programs have a modest positive effect on reducing costs.

2.15 Marcello Contestabile (2012)

In "Electric Vehicles: A Conflation of the Current Literature with a Focus on Economic and Environmental Viability", Marcello Contestabile, Dr. Gregory Offer and Dr. Robin North conclude that the long-term adoption of electric vehicles will largely depend on advancements in battery technology, which are essential for reducing costs and enhancing energy efficiency, as well as the establishment of a robust charging infrastructure.

2.16 M Pierre (2011)

In the 1990's some individuals opted for electric vehicles for their daily commutes, supported by certain local governments in their initiatives. M Pierre by reviewing research from 2006 to 2008 he aims to explore the reasons behind the unconventional choice, highlight the challenges faced by electric vehicle users at that time and analyse the usage pattern that influence their mobility and adoption of electric vehicles.

2.17 Mr. A Rakesh Kumar (2019)

In “Overview and Challenges of Indian Electric Vehicles”, Dr. Sanjeevikumar Padmanaban and Mr. A Rakesh Kumar highlights the urgent need to reduce carbon dioxide emissions and combat rising global pollution. The transportation sector is a major contribution to carbon dioxide emissions, it is essential to implement reductions in this area. Shifting from internal combustion engines to electric vehicles presents a major challenge for India, requiring thorough planning and extensive research and development efforts. It also suggests about the importance to stimulate demand by electrifying all government vehicles and offering tax exemptions to certain EV owners.

2.18 Janardan Prasad Kesari (2019)

In “Electric Vehicle Opportunities and Scope in India”, Janardan Prasad Kesari, Yash Sharma and Chahat Goel emphasize that the government must address several challenges to create an ambitious plan for the resurgence of electric vehicles in India and to prevent any potential setbacks. India’s diverse geography and conditions will require careful consideration. The purchase of four-wheeled government vehicles, three-wheelers and public transport alternatives is likely to be a central factor in fuelling the adoption of electric vehicles in India. In addition, investments by ride-sharing firms such as Ola and Uber, as well as food delivery outlets, are poised to speed up the early take-up of two and four-wheeled electric vehicles.

2.19 Attri R, Kushwaha P S

The study “Electric Vehicles in India: Identifying the Adoption Predictors” by Attri and Kushwaha explored the factors that affect Indian consumer’s willingness to adopt electric vehicles. By employing the extended Unified Theory of Acceptance and Use of Technology model, the research analysed various elements influencing consumers intentions to purchase electric vehicles. The findings indicated that, except for hedonic motivation and price value, all other factors significantly impacted the decisions to buy electric vehicles.

2.20 Vishwakarma P.

“Investigating consumers adoption of electric vehicles: A perceived value-based perspective by Vishwakarma aims to explore consumers adoption of electric two-wheelers through the lens of the value-based adoption model. The results reveal that perceived economic benefits, social image, enjoyable acceleration, enhanced fun and environmental advantages positively affect consumers perceived value of electric two-wheelers. In contrast, factors such as perceived physical safety risks, cost of ownership and worries about range and charging have a negative impact on perceived value. Notably, low engine noise emission and infrastructure concerns did not significantly influence perceived value.

2.21 Satyendra Pratap Singh, Nitish Sharma, Shukla Ashish Chandrakant, Surendra Pratap Singh (2021)

This study focuses on India as a whole where air pollution has become a significant concern in India, with recent global reports identifying many Indian cities has become one of the most polluted in the world. The transport and manufacturing industries are the biggest contributors to the issue, with air pollution leading to an estimated 2 million premature deaths every year in India. Electric cars could significantly cut greenhouse gas emissions and contribute to reducing pollution, along with lessening the country's oil import bill and dependence. Yet the mass adoption of EVs in India remains heavily impacted by several challenges. This paper presents a brief literature review on electric vehicles, highlighting their advantages and the obstacles to their promotion in India.

2.22 Mohammed Meer-Ahmed M. Alia and Anand A Deshmukh

Electric vehicles are becoming an important solution to the environmental problem caused by fossil fuel use and the high levels of pollution produced by traditional cars. The decrease in natural resources and increase in fuel cost also highlight the necessity of EVs as a sustainable, low-carbon mode of transportation. Under these circumstances, it is imperative to know consumers perception and expectations. This article aims to review existing literature on electric vehicle adoption and examine consumer perceptions and intentions regarding the transition to electric vehicles.

2.23 Shyam Patidar

The increasing number of automobiles and rising sales in India are driving up fuel consumption, leading to higher dependence on oil imports, increased costs and more emissions. This calls for a sustainable mobility solution. Electric vehicles align with India's e-mobility and economic goals, helping to reduce reliance in foreign oil and address environmental issues. EVs can help mitigate global warming, offering a real solution. This paper discusses the current situation and progress of EV in India.

2.24 Pretty Bhalla, Inass Salamah Ali, Afroze Nazneen (2018)

Increasing environmental concerns are driving the production and sales of electric vehicles. In order to determine the commercial prospects and buying intentions of Indian consumers, it is essential to look into the factor affecting their acceptance of EVs. The influential factors that affect car buyers' judgements include their perceptions of green issues, affordability, confidence in EV technology, infrastructural availability and social acceptance. Evidence shows that environmental concern and faith in technology largely influence consumer mindsets towards buying EVs. Still, obstacles such as high prices, inadequate infrastructure and social acceptance may slow down adoption. To enhance

EV sales, the government can promote the market by pursuing environmental policies, improving infrastructure and providing incentives such as subsidies or lower interest rates for car loans.

2.25 Masurali A, Surya P (2018)

The perception and response of implicit passengers to electric buses is explored by Masurali. India accounts for nearly 18% of the glob's carbon footprint, according to Surya P, which is why using electric vehicles as a viable solution is important. As a reaction, numerous manufacturers are expanding their lineups to incorporate EVs. Promoting these vehicles can significantly reduce energy consumption and pollution, benefiting both the country and its citizens. Increased public awareness of EVs has emerged from educational efforts. The government should take proactive steps to enhance awareness and reshape the perceptions of implicit passengers, which often diverge from those of manufacturers.

2.26 Indukala M.P, Bincy M. Mathew

This paper looks at future of electric vehicles in India as the world shifts towards electric mobility. While electric vehicles offer many advantages, several challenges must be address to boost their adoption. A reliable charging infrastructure is key to increasing electric vehicle usage and tackling issues like range anxiety and charging time is vital for progress. Easy and affordable access to both standard AC and rapid DC charging options is essential to meet consumer needs. Additionally, it's important to assess and manage how electric vehicles charging affects the power grid and related systems.

2.27 Martina Ziefle, Shirley Beul-Leusmann, Kai Kasugai and Maximilian Schwalm

This study performs and empirical analysis to investigate the determinants of electric vehicle acceptance. It is important to know both the reasons for adopting EVs and the perceived difficulties in order to promote public acceptance on a large scale. The findings indicate that traditional cars are still perceived as more comfortable and reliable than electric cars. Age and gender influence perceptions with older individuals and women showing greater acceptance due to higher environmental awareness. Despite men reporting more knowledge, it didn't significantly affect their acceptance.

2.28 Claas, B., Marker, S., Bickert, S., Linssen, J.

This paper examines the current state of electromobility and its development trends in Germany. The repost analyses prospects for developing electromobility and considers amin research and

development activities, including field trails of plug-in hybrid and electric cars. It ends by providing visions for the future of electromobility in Germany.

2.29 Reji Kumar Pillai, Reena Suri, Suddhasatta Kundu, Harpreet Singh, Shuvam Sarkar Roy, Shreekant Dhuri.

The availability of charging facilities in public spaces is a crucial requirement for the adoption and expansion EVs. This paper explores various issues concerning electric vehicles supply equipment or charging stations including policies, standards, interoperability and business models aimed at creating a supportive EVSE ecosystem to facilitate the faster rollout of electric vehicles.

2.30 Praveen Kumar, K. Dash (2013)

This paper examines the potential need for electric vehicles and charging stations infrastructure in the Indian context along with the associated challenges. Battery electric vehicles represent a promising class of drivetrains particularly in urban areas, as they can help shift decentralized exhaust emissions in megacities to centralized power plants in rural regions. At the times, he also noted that BEVs are limited to a range of about 100km per charge due to restricted onboard energy. He proposed that the introduction of plug-in hybrid vehicles combined with real-time traffic management could improve the situation.

CHAPTER 3

THEOROTICAL FRAMEWORK

3.1 HISTORY OF ELECTRIC VEHICLES

In the early part of the century, inventors in Hungary, the Netherlands and United States, among them a Vermont blacksmith started experimenting with the idea of an electric vehicle powered by a battery and developed some of the earliest small scale electric vehicles. Although, British inventor Robert Anderson created the first primitive electric carriage during this same period, it wasn't until the latter part of the 19th century that English and French inventors constructed some of the first usable electric automobiles. In the US, the first practical electric automobile debuted around 1890 thanks to William Morrison, a chemist who resided in Des Moines, Lowa. In the following years electric vehicles from various car manufacturers started appearing all over the U.S New York City even had a fleet of over 60 electric cabs. By 1990, electric vehicles were in their peak, representing about a third of all cars on the road. Over the following 10 years, they continued to exhibit robust sales. Electric cars went into a kind of dark ages with not much development in the technology. Rising oil prices and gasoline shortages culminating with the 1973 Arab Oil Embargo made increasing interest in reducing the United States relies on foreign oil and discovering home turf sources of fuel. During the 20 years since the long gas lines of the 1970s, interest in electric vehicles had all but faded away. With a thriving economy, an expanding middle class and cheap gas in the late 1990s, most consumers did not give a thought to normal vehicles. Although there was a little public scrutiny of electric vehicles during this period, in the background, researchers and engineers, aided by the Energy Department were making efforts to enhance electric vehicle technology, including batteries. While all the beginning and ending of the electric vehicle business during the latter half of the 20th century served to introduce the world to the potential of the technology, the real rebirth of the electric vehicles didn't occur until about the beginning of the 21st century. Depending on who you ask, it was one of two things that got people excited about electric vehicles today. The initial turning point that has been proposed was the launch of Toyota Prius. Launched in Japan in 1997, the Prius became the world's mass-produced hybrid electric vehicle. The second event that contributed to the transformation of electric vehicles was the 2006 announcement that a small Silicon Valley start-up, Tesla motors, would begin manufacturing a luxury electric sports car that could travel over 200 miles on a single charge. Today, consumers enjoy more options than ever for the purchase of an electric vehicle. There are now 23 plug-in electric and 36 hybrids in a range of sizes from the two-seater Smart ED to the Ford C-Max energi midsize to the BMW i3 luxury SUV. The United States Electric Vehicle market share has broken its previous high of 8.9% in Q3 in 2024 EV sales were 11% higher compared to the same period last year, reaching a total of 3,46,309 sales during the third quarter.

In May 2024, sales of electric vehicles in India rose by 20.88% to 1.39 million units. Electric vehicles sales in India increased considerably by 49.25% in 2023 to 1.52 million units. Even though the industry is yet to pick up, it is gradually gaining momentum.

Electric vehicles can be generally classified into two broad categories depending on how much they are dependent on electricity as a source of energy.

1. Battery electric vehicles (BEVs)

   BEVs are electric vehicles which use electricity exclusively for motive power, and which do not employ a petrol engine. They make little or no noise, they are economical to operate, and they contribute less to environmental harm. Their price tag may be higher on first purchase than for similar petrol models, but BEVs are likely to be a very economic vehicle to own overall over the vehicle's lifespan and could well work out more cheaply in the long run.

2. Plug-in Hybrid Electric Vehicles (PHEVs)

   PHEVs operate on a mixture of petrol and electricity. Their range when driven purely on electricity varies with the capacity of the battery. The most important benefit of PHEVs over BEVs is that they are able to keep going on petrol in the absence of charging stations. Nevertheless, the cost of keeping both electric and fuel systems might be higher compared to a BEV. Also, once the relatively small battery runs out, the financial and ecological advantages of an EV are wasted util the battery can be charged again.

3.2 CUSTOMER SATISFACTION

Customer preference studies of electric vehicles (EVs) provide important inputs into the determinants of customer satisfaction. The results demonstrate that customers consider factors such as environmental influence, price, driving experience and convenience while choosing an EV. Customers concerned about environmental benefits are inclined towards EVs and are willing to pay extra for a green option and understand the beneficial environmental impact of EVs. On the other hand, cost-conscious customers might choose conventional vehicles because they are cheaper to buy and have an extensive refuelling network.

The driving experience also significantly impacts customer satisfaction. EVs provide a smoother, quieter ride, appealing to customers who seek a comfortable and enjoyable driving experience. Additionally, convenience is crucial in Ernakulam city, the availability of EV charging stations has steadily increased, with malls, hotels and public parking areas offering charging facilities. Efforts by local authorities and private companies to expand this network further enhance accessibility.

In short, growing satisfaction with EVs in Kerala is an indicator of the state's environmental concern and focus on sustainable transportation. By 2024, better charging facilities, technological developments and enhanced awareness of EV advantages have substantially increased their

popularity. With sustained government encouragement and enhanced consumer confidence, EVs will become a sought-after option among residents, leading to the growth of the sector.

3.3 CUSTOMER AWARENESS AND EDUCATION

Building awareness and educating consumers about electric vehicles is important in advancing their mass adoption and adaptation. With the automobile industry moving towards cleaner options, potential customers are typically tormented by myths and uncertainties about EV technology, charging infrastructure and acceleration compared to conventional vehicles. To fill this knowledge gap, various activities such as workshops, training seminars and outreach programs are being conducted to sensitize consumers towards EV advantages. These activities highlight reduced operating costs, lower maintenance needs and increased environmental benefit in the form of lower greenhouse gas emissions.

Additionally, experiential exposures such as test-drive opportunities and collaboration with local dealerships allow customers to experience EVs firsthand, reducing range anxiety and charging plan worries. Increased charging station facilities and ease of use phone apps to locate charging stations further boost consumer's confidence. Social media engagement and word-of-mouth reinforcement from current EV owners also play a significant role in creating positive attitudes and dispelling myths. Lastly, building and informed customer base is key to accelerating the shift to electric mobility, allowing individuals to make informed decisions and embrace environment friendly transport solutions.

3.4 BRAND AWARENESS AND LOYALTY

EV brand awareness and allegiance are slowly progressing as the demand for clean energy transport continues to gain prominence on the consumer's radar. Whereas conventional vehicle manufacturers continue to control on lion's share in their markets as well-established players based on history of reliability and having vast consumer lists, EV model's attraction improves steadily among ecological-conscious buyers intent on saving the environment through new green energy substitutes.

Domestic players in India such as Tata Motors, Mahindra & Mahindra and Hyundai have gone a long way in the Indian EV space with the launch of innovative and efficient electric vehicles. These players have received good customer feedback, making them more reputed leaders in taking the country towards green mobility. Their attempts to develop cost-effective, efficient and accessible electric vehicles have fortified consumer confidence and helped drive greater brand loyalty.

As the number of EV models increases and the advantage of EVs like lower costs of operation, reduced emissions and smoother rides gain great recognition, consumer interest and confidence will increase. Advertising campaigns touting these benefits, in combination with experiential experiences such as test drives and word of mouth, play a key role in constructing positive attitudes. Moreover, the growth of charging infrastructure, favourable government policies and partnerships with local dealerships also help to enhance visibility and accessibility of EVs. These elements are instrumental in driving brand awareness, building trust and fostering long-term customer loyalty.

As of 2024, various brands provide electric vehicles, responding to a rapidly expanding market that prioritizes sustainability and innovation. Some of the leading brands include:

1. Tesla – Known for its Model S, Model 3, Model X and Model Y, Tesla has been a pioneer in the EV market.
2. Nissan – The Nissan Leaf is one of the best-selling electric cars globally.
3. Chevrolet – The Chevrolet Bolt EV and Bolt EUV offer practical electric options.
4. Ford – The Ford Mustang Mach-E and the F-150 lightning are key models in their EV lineup.
5. Volkswagen – The ID.4 and ID. Buzz represent Volkswagen's commitment to electric mobility.
6. Hyundai – The Hyundai Kona Electric and loniq 5 are gaining popularity for their range and features.
7. Kia – The Kia EV6 and Niro EV are noteworthy contenders in the market.
8. BMW – BMW offers models like the i4 and iX, focusing on performance and luxury.
9. Mercedez Benz – The EQ series, including the EQS and EQB, showcases their shift towards electric vehicles.
10. Audi – The Audi e-tron and Q4 e-tron cater to luxury EV buyers.
11. Rivian – Known for its electric trucks, the R1T and R1S are designed for adventure and utility.
12. Lucid Motors – The Lucid Air focuses on high performance and luxury in the electric segment.
13. Porsche – The Porsche Taycan combines luxury with high performance electric driving.

These brands, among others, are continually expanding their EV offerings as the demand for electric vehicle grows. And as the Indian EV market continues to evolve brand recognition and allegiance to electric vehicles will increase, driving the transition towards cleaner and more innovative transport solutions.

3.5 ADVANTAGES OF ELECTRIC VEHICLES

- Eco-friendly: Electric vehicles release no emissions, so they are significantly cleaner choice compared to regular vehicles. This is particularly significant in India where pollution is a severe issue.
- Incentives from the government: The Indian government offers a range of incentives for buying electric vehicles, including tax relief and subsidies.
- Quietest driving experience: Electric vehicles create a smoother and quieter driving experience than conventional vehicles, which is perfect for urban driving.
- Better technology: The technology of electric vehicles is continuously getting better, leading to improved performance and a longer life for the batteries.
- Less reliance on foreign oil: India is particularly reliant on foreign oil, and this can prove to be expensive and susceptible to supply shortages. Electric vehicles eliminate this by employing locally generated electricity.
- Lesser noise pollution: Electric vehicles contribute less noise pollution than conventional vehicles, which means they are especially suited for usage in cities where noise pollution poses a huge threat.
- Lower cost of maintenance: Electric vehicles do not have moving parts as numerous as that in conventional vehicles, meaning less expense for maintenance of the car in the long term.
- Healthier air quality: Electric vehicles emit zero tailpipe emissions and hence it create healthier air around urban cities while also mitigating respiratory diseases.

3.6 DISADVANTAGES OF ELECTRIC VEHICLES

- Limited range: The largest disadvantages of electric vehicles is their limited range. Most electric vehicles have range of about 100-150 kms on a single charge, which might not be enough for long distance driving.
- High upfront cost: Electric vehicles are more costly than regular vehicles and hence less affordable for most consumers.
- Extended charging time: It takes a longer time to charge electric vehicles compared to refuelling a conventional vehicle and it can be difficult for the motorists who have long-distance driving requirements.
- Deterioration of the batteries: The life of the battery of the electric vehicles can decay with time, and it would give less mileage and performance.
- Reliance on power: Electric vehicles rely on the availability of continuous power, and this may or may not be available in a few regions in India.

- Performance in low temperature: Electric vehicles can lose range and power in low temperature conditions.
- Weight factor: Electric vehicles tend to be heavier than conventional vehicles due to the weight of the battery, which can impact their handling and performance.

3.7 BARRIERS IN ADOPTION OF ELECTRIC VEHICLES

The acceptance of electric vehicle depends upon a series of factors, these barriers are identified through articles, blogs and websites. There are mainly three barriers which are:

3.7.1 Technical Barriers

Majority of the consumers are unaware of the technology in electric vehicles, which makes them feel uneasy when using or buying an electric vehicle. Electric vehicle sales in India are comparatively low because there is hardly any public awareness of the technology. Technical obstacles are influenced by a number of things which are:

- Limited range: Electric vehicles run on batteries, which must be charged in order for the vehicle to operate. The anxiety over range is one of the main issue with electric vehicle. Customers who do not frequently travel large distance are more likely to use electric vehicles. This leads us to the conclusion that the range of electric vehicle is a technical challenge.
- Battery technology: Charging technology is increasing in speed, but EV batteries require more time to charge than refuelling conventional vehicles, and they lose capacity and efficiency over time.

3.7.2 Social Barriers

This includes the consumer's knowledge, surroundings, experiences and interactions with other people while understanding the characteristics of electric vehicles. Common social barrier to electric vehicle:

- Lack of knowledge: The consumers are not fully aware of the benefits and limitations of electric vehicles. They do not know the functioning of the electric vehicles and hence perceive that the electric vehicles will cost them more than the normal vehicles.
- Reliability and performance: Electric vehicles are relatively new and have more modern technology, their dependability and functionality are questioned by consumers who are unaware of this technology.

3.7.3 Economic Barriers

Electric vehicles are more expensive than a normal vehicle and the lower cost of other vehicles are generally the biggest barrier for electric vehicles. The barriers include:

- High purchase price: Customers consider the increased cost of electric vehicles to be a serious problem. Due to their greater manufacturing costs, electric vehicles are more expensive than normal vehicles. Giving incentives and providing subsidies for electric vehicles would encourage people to buy them and it is becoming a common strategy in many nations to improve sales.
- Battery replacement cost: An electric vehicle battery has a life span of 7 years to 9 years and the consumers are responsible for the expense of replacement. This difficulty serves a significant road block to buy an electric vehicle.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

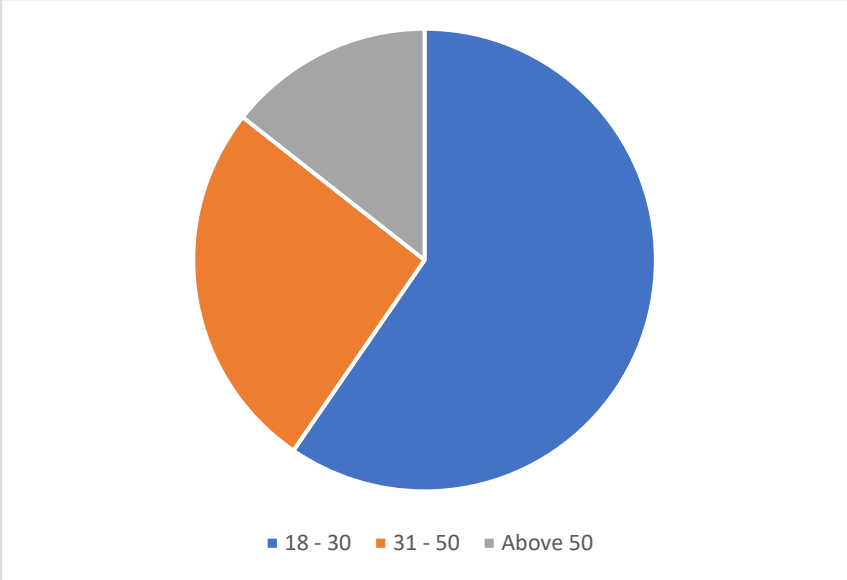
AGE WISE CLASSIFICATION

Table 4.1 Age wise classification

AGE	NO. OF RESPONDENTS	PERCENTAGE
18 - 30	62	59.6%
31 - 50	27	26%
Above 50	15	14.4%
Total	104	100%

Source: Primary data

Figure 4.1 Age wise classification



Source: Primary data

INTERPRETATION

Out of 104 respondents, 59.6% of them are in the age group of 18-30, 26% of them are in the age group of 31-50 and 14.4% of them are above 50.

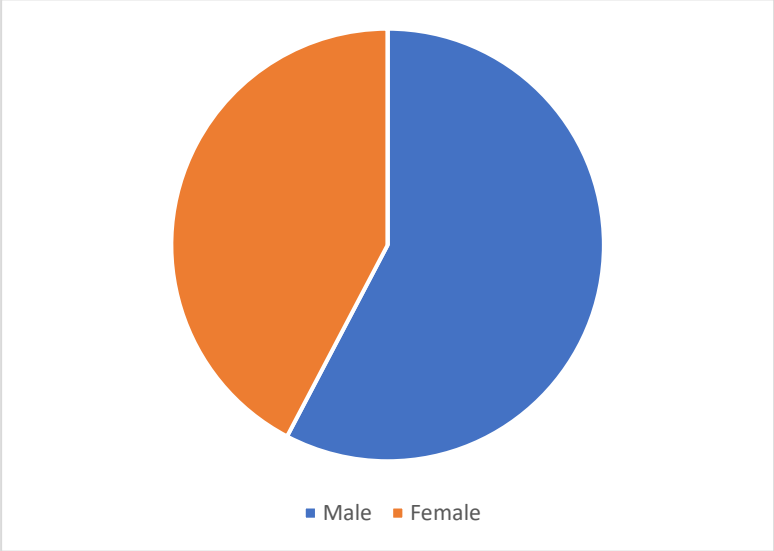
GENDER WISE CLASSIFICATION

Table 4.2 Gender wise classification

GENDER	NO. OF RESPONDENTS	PERCENTAGE
Male	60	57.7%
Female	44	42.3%
Others	0	0
Total	104	100%

Source: Primary data

Figure 4.2 Gender wise classification



Source: Primary data

INTERPRETATION

Out of 104 respondents, 57.7% of them are male and 42.3% of them are female.

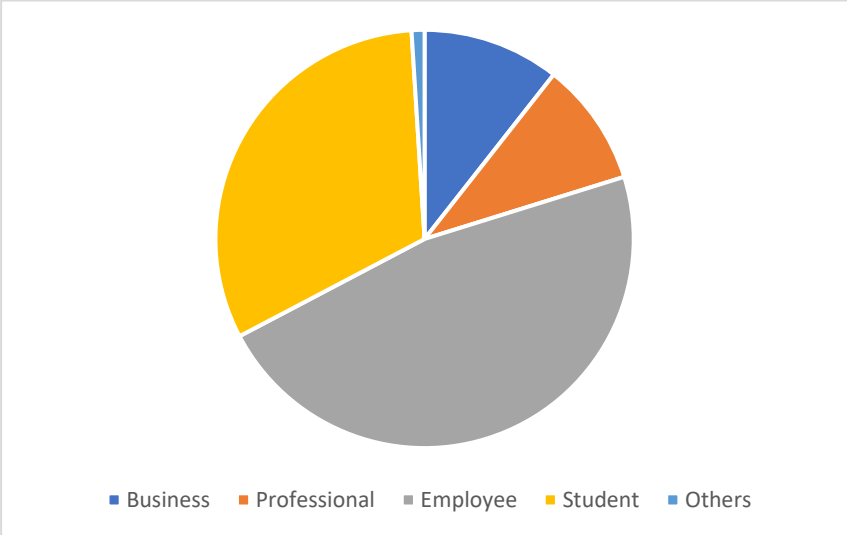
OCCUPATION OF THE RESPONDENTS

Table 4.3 Occupation of the respondents

OCCUPATION	NO. OF RESPONDENTS	PERCENTAGE
Business	11	10.6%
Professional	10	9.6%
Employee	49	47.1%
Student	33	31.7%
Others	1	1%
Total	104	100%

Source: Primary data

Figure 4.3 Occupation of the respondents



Source: Primary data

INTERPRETATION

Out of 104 respondents, 47.1% of them are employees, 31.7% are students, 10.6% are business persons, 9.6% are professionals and 1% belongs to others category.

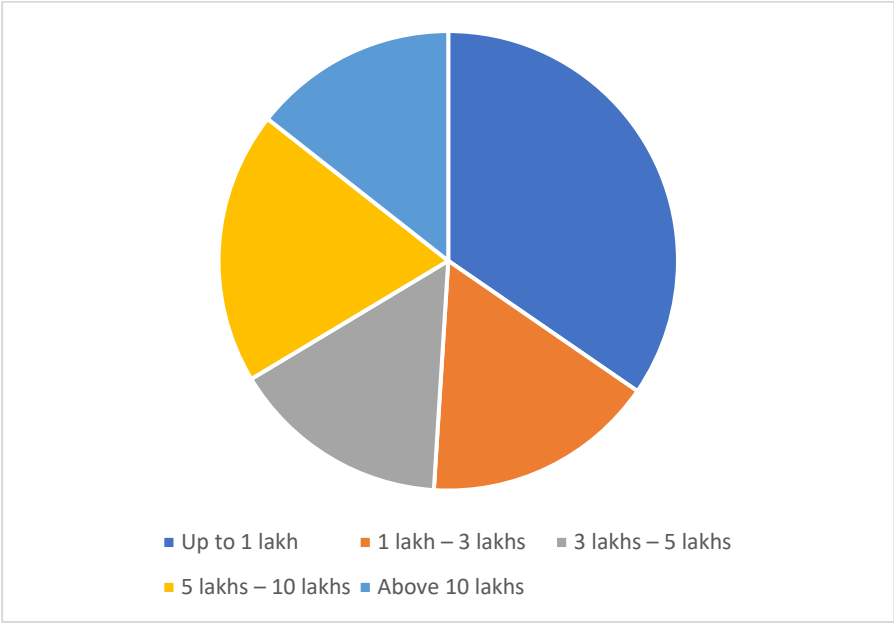
ANNUAL INCOME OF THE RESPONDENTS

Table 4.4 Annual income of the respondents

ANNUAL INCOME	NO. OF RESPONDENTS	PERCENTAGE
Up to 1 lakh	36	34.6%
1 lakh – 3 lakhs	17	16.4%
3 lakhs – 5 lakhs	16	15.4%
5 lakhs – 10 lakhs	20	19.2%
Above 10 lakhs	15	14.4%
Total	104	100%

Source: Primary data

Table 4.4 Annual income of the respondents



Source: Primary data

INTERPRETATION

Out of 104 respondents, 34.6% of them have an annual income up to 1 lakh, 19.2% have an annual income between 5 lakh – 10 lakhs, 16.4% have an annual income between 1 lakh – 3 lakhs, 15.4% have an annual income between 3 lakhs – 5 lakhs and 14.4% have an annual income above 10 lakhs.

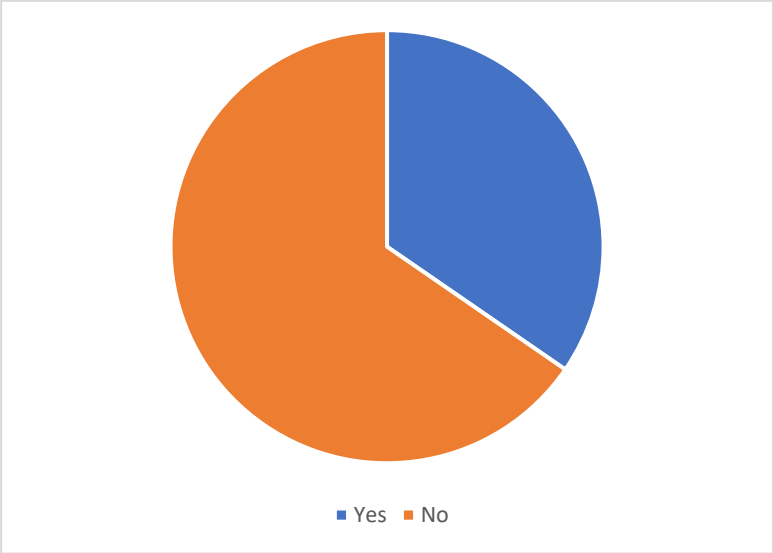
RESPONDENTS WHO USE ELECTRIC VEHICLE

Table 4.5 Respondents who use electric vehicle

USER	NO. OF RESPONDENTS	PERCENTAGE
Yes	36	34.6%
No	68	65.4%
Total	104	100%

Source: Primary data

Figure 4.5 Respondents who use electric vehicle



Source: Primary data

INTERPRETATION

Out of 104 respondents, 65.4% of them are conventional vehicle users and 34.6% are electric vehicle users.

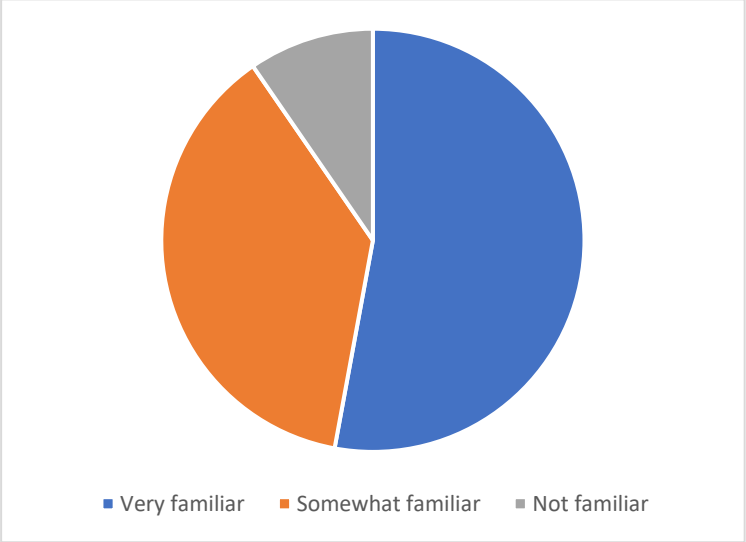
FAMILIARITY TOWARDS ELECTRIC VEHICLES

Table 4.6 Familiarity towards electric vehicles

RESPONSE	NO. OF RESPONDENTS	PERCENTAGE
Very familiar	55	52.9%
Somewhat familiar	39	37.5%
Not familiar	10	9.6%
Total	104	100%

Source: Primary data

Figure 4.6 Familiarity towards electric vehicles



Source: Primary data

INTERPRETATION

Out of 104 respondents, 52.9% of them are very familiar, 37.5% are somewhat familiar and 9.6% are not at all familiar with electric vehicles.

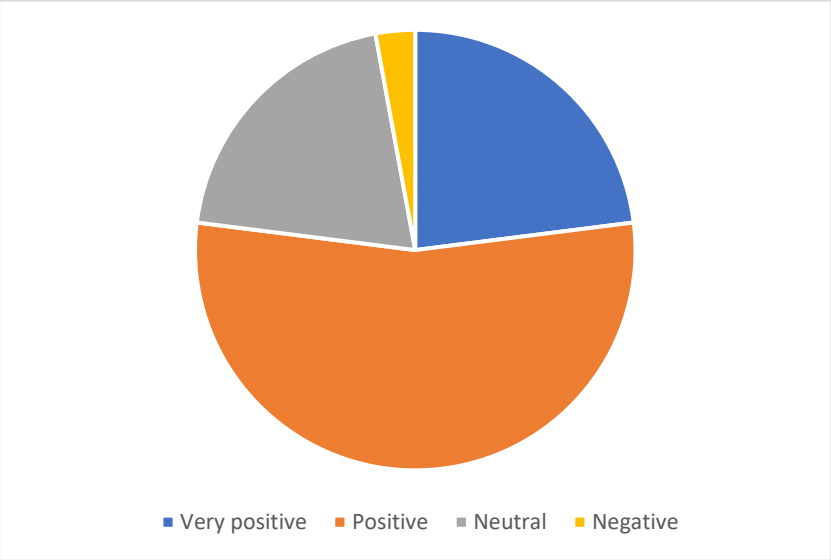
GENERAL PERCEPTION ON ELECTRIC VEHICLES

Table 4.7 General perception on electric vehicles

PERCEPTION	NO. OF RESPONDENTS	PERCENTAGE
Very positive	24	23%
Positive	56	54%
Neutral	21	20.1%
Negative	3	2.9%
Very negative	0	0%
Total	104	100%

Source: Primary source

Figure 4.7 General perception on electric vehicles



Source: Primary data

INTERPRETATION

Out of 104 respondents, 54% of them have a positive perception towards electric vehicles, 23% have a very positive perception, 20.1% have a neutral perception and 2.9% have a negative perception towards electric vehicles.

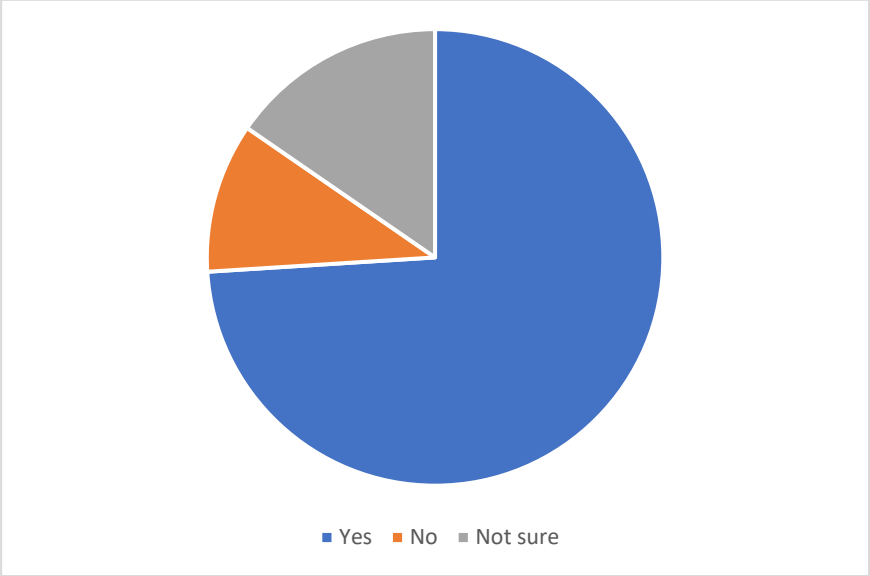
VIEW ON WHETHER ELECTRIC VEHICLES ARE GOOD ALTERNATIVE TO CONVENTIONAL VEHICLES

Table 4.8 View on whether electric vehicles are good alternative to conventional vehicles

POINT OF VIEW	NO. OF RESPONDENTS	PERCENTAGE
Yes	77	74%
No	11	10.6%
Not sure	16	15.4%
Total	104	100%

Source: Primary data

Figure 4.8 View on whether electric vehicles are good alternative to conventional vehicles



Source: Primary data

INTERPRETATION

Out of 104 respondents, 74% of them agree, 15.4% are not sure and 10.6% disagree that electric vehicles are a good alternative to conventional vehicles.

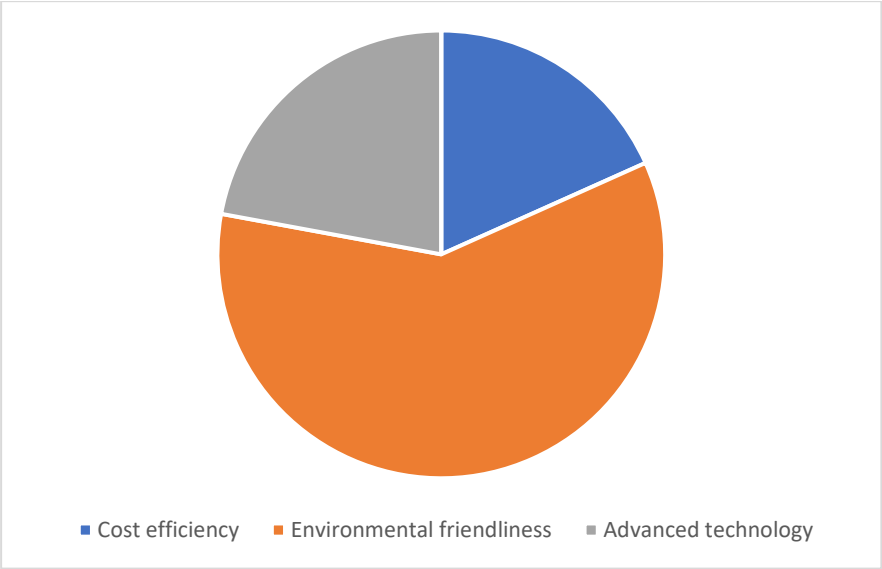
PRIMARY ADVANTAGE OF ELECTRIC VEHICLES

Table 4.9 Primary advantage of electric vehicles

ADVANTAGE	NO. OF RESPONDENTS	PERCENTAGE
Cost efficiency	19	18.3%
Environmental friendliness	62	59.6%
Advanced technology	23	22.1%
Others	0	0%
Total	104	100%

Source: Primary data

Figure 4.9 Primary advantage of electric vehicles



Source: Primary data

INTERPRETATION

Out of 104 respondents, 59.6% of them consider environment friendliness, 22.1% consider advanced technology and 18.3% consider cost efficiency as the primary advantage of electric vehicles.

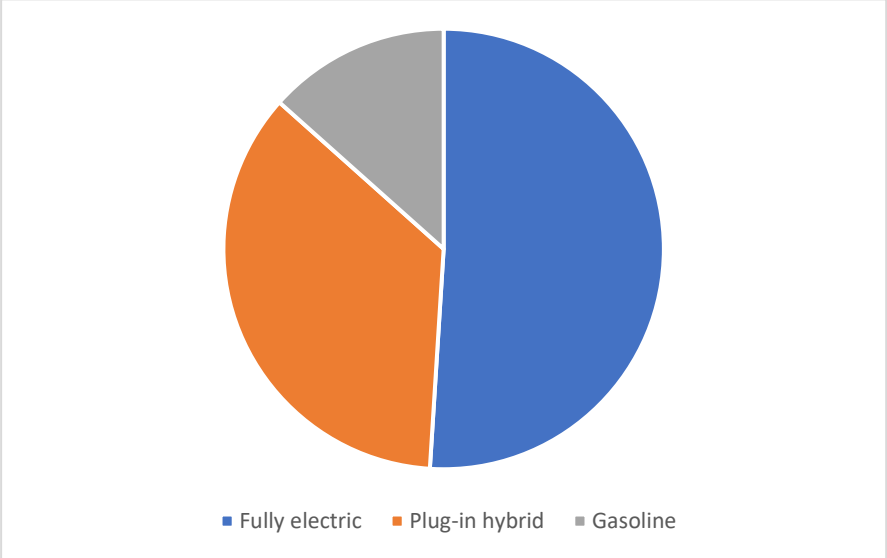
MOST PREFERRED VEHICLE

Table 4.10 Most preferred vehicle

TYPE	NO. OF RESPONDENTS	PERCENTAGE
Fully electric	53	51%
Plug-in hybrid	37	35.6%
Gasoline	14	13.4%
Total	104	100%

Source: Primary data

Figure 4.10 Most preferred vehicle



Source: Primary data

INTERPRETATION

Out of 104 respondents, 51% of them prefer fully electric vehicles (EVs), 35.6% prefer plug-in-hybrid vehicles and 13.4% prefer gasoline vehicles.

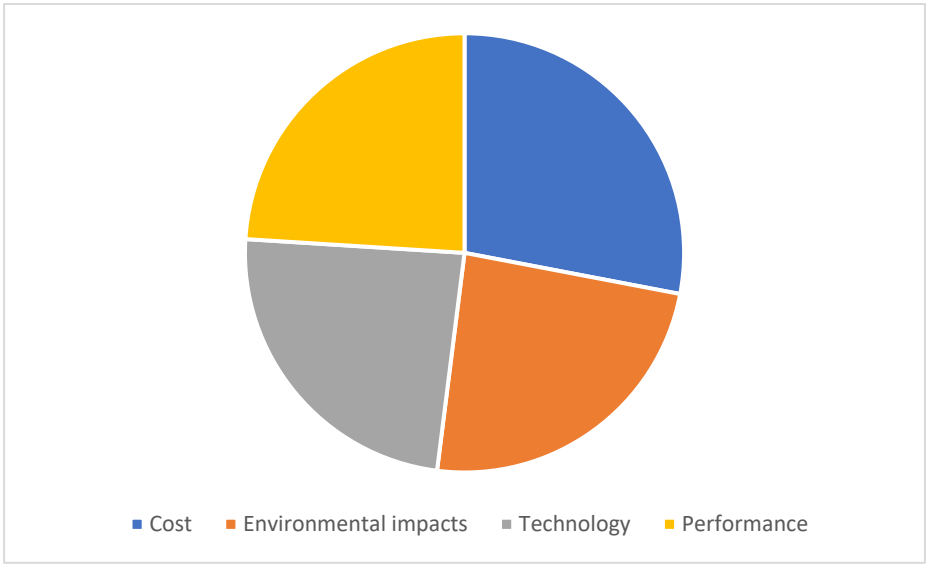
THE FACTOR PRIORITIZED WHILE CONSIDERING TO PURCHASE AN EV

Table 4.11 The factor prioritized while considering to purchase of an EV

FACTORS	NO. OF RESPONDENTS	PERCENTAGE
Cost	29	28%
Environmental impacts	25	24%
Technology	25	24%
Performance	25	24%
Total	104	100%

Source: Primary data

Figure 4.11 The factor prioritized while considering to purchase an EV



Source: Primary data

INTERPRETATION

Out of 104 respondents, 28% of them prioritize cost, 24% prioritize environmental impacts, 24% prioritize technology and 24% prioritize performance while considering to purchase an EV.

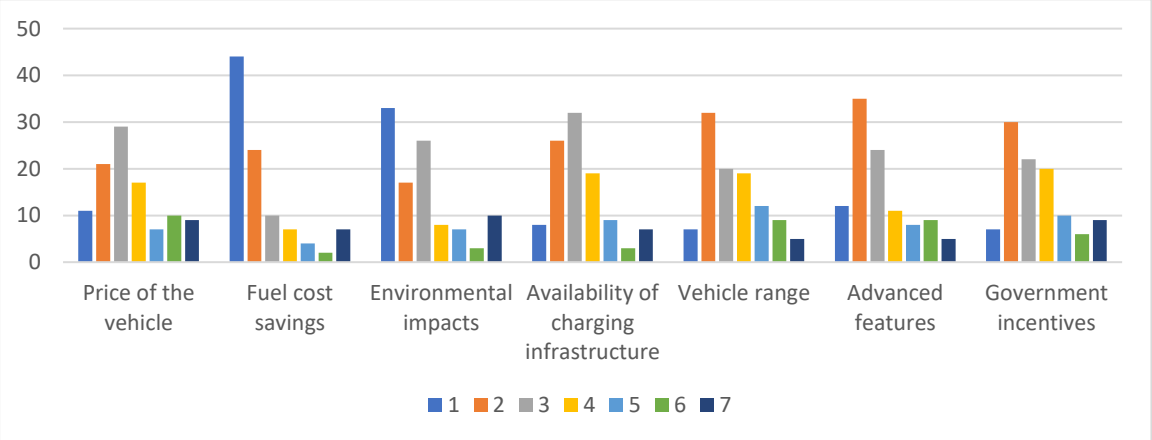
FACTORS THAT INFLUENCE THE MOST TO PURCHASE AN EV

Table 4.12 Factors that influence the most to purchase an EV

Factors	1	2	3	4	5	6	7
Price of the vehicle	11	21	29	17	7	10	9
Fuel cost savings	44	24	10	7	4	2	13
Environmental impacts	33	17	26	8	7	3	10
Availability of charging infrastructure	8	26	32	19	9	3	7
Vehicle range	7	32	20	19	12	9	5
Advanced features	12	35	24	11	8	9	5
Government incentives	7	30	22	20	10	6	9

Source: Primary data

Figure 4.12 Factors that influence the most to purchase an EV



Source: Primary data

INTERPRETATION

Out of 104 respondents, 42.3% of them ranked fuel cost savings as the 1st major factor, 33.6% ranked advanced features as the 2nd major factor and 30.7% ranked availability of charging infrastructure as the 3rd major factor that influence the most to purchase an electric vehicle.

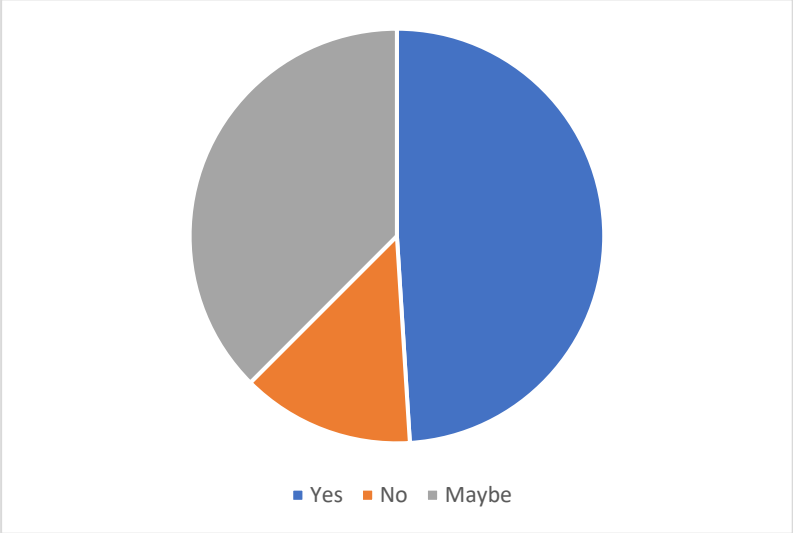
ENCOURAGEMENT OF GOVERNMENT INCENTIVES TOWARDS THE PURCHASE OF EVs

Table 4.13 Encouragement of government incentives towards the purchase of EVs

RESPONSE	NO. OF RESPONDENTS	PERCENTAGE
Yes	51	49%
No	14	13.5%
Maybe	39	37.5%
Total	104	100%

Source: Primary data

Figure 4.13 Encouragement of government incentives towards the purchase of EVs



Source: Primary data

INTERPRETATION

Out of 104 respondents, 49% of them states that government incentives encourage the public, 37.5% are not sure whether government incentives encourage the public or not, 13.5% states that government incentives will not encourage the public towards the purchase of EVs.

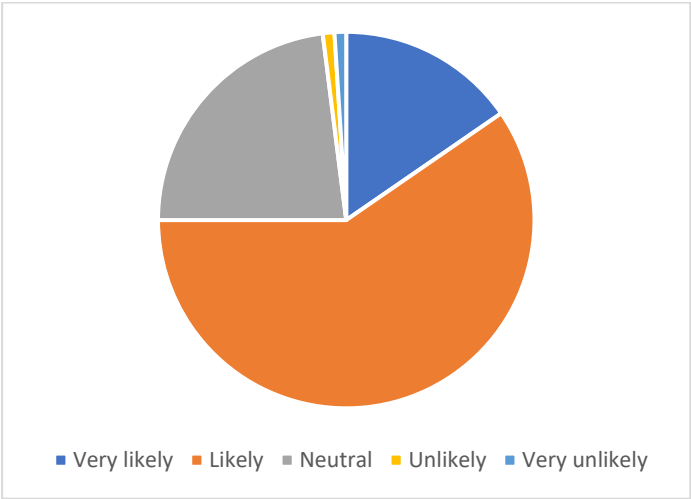
INFLUENCE OF EASY ACCESS TO CHARGING STATIONS IN THE PURCHASE OF EVs

Table 4.14 Influence of easy access to charging stations in the purchase of EVs

INFLUENCE	NO. OF RESPONDENTS	PERCENTAGE
Very likely	16	15.4%
Likely	62	59.6%
Neutral	24	23%
Unlikely	1	1%
Very unlikely	1	1%
Total	104	100%

Source: Primary data

Figure 4.14 Influence of easy access to charging stations in the purchase of EVs



Source: Primary data

INTERPRETATION

Out of 104 respondents, 59.6% of them has a likely opinion, 23% has neutral opinion, 15.4% has a very likely opinion 1% has an unlikely opinion and 1% has very unlikely opinion that, easy access to charging stations influence in deciding the purchase of electric vehicles

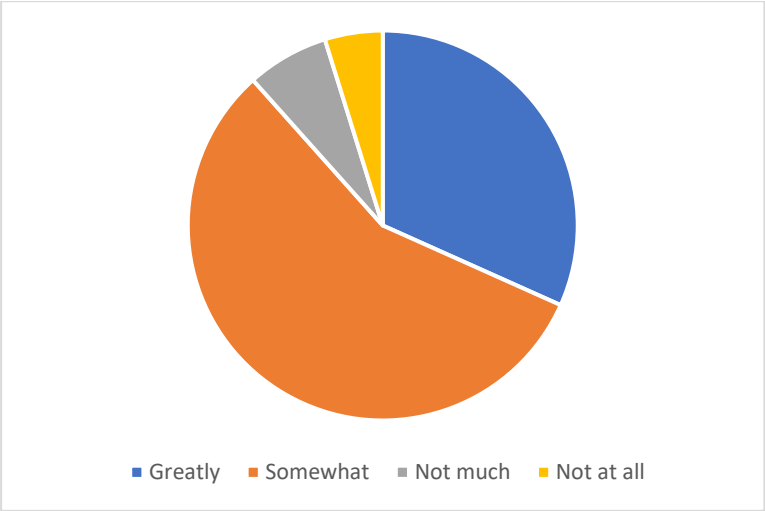
INFLUENCE OF ADVANCEMENTS IN EV CHARGING TECHNOLOGY IN THE GROWTH OF EVs

Table 4.15 Influence of advancements in EV charging technology in the growth of EVs

RESPONSE	NO. OF RESPONDENTS	PERCENTAGE
Greatly	33	31.7%
Somewhat	59	56.7%
Not much	7	6.8%
Not at all	5	4.8%
Total	104	100%

Source: Primary data

Figure 4.15 Influence of advancements in EV charging technology in the growth of EVs



Source: Primary data

INTERPRETATION

Out of 104 respondents, 56.7% of them states that the advancements in EV charging technology have somewhat influenced, 31.7% states that it has greatly influenced, 6.8% states that it has not much influenced and 4.8% states that it has not at all influenced in the growth of EVs.

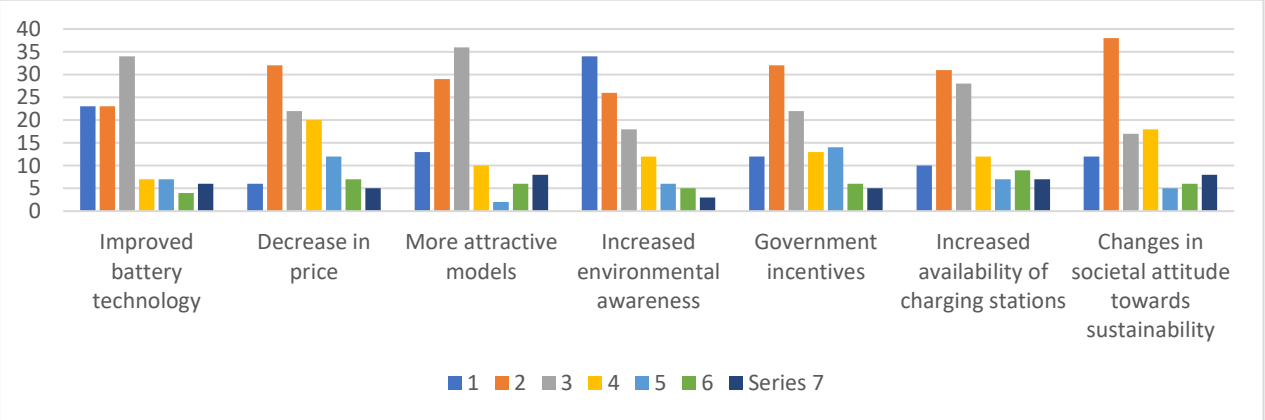
FACTORS THAT INFLUENCED THE GROWTH IN THE PURCHASE OF EVs

Table 4.16 Factors that influenced the growth in the purchase of EVs

FACTORS	1	2	3	4	5	6	7
Improved battery technology	23	23	34	7	7	4	6
Decrease in price	6	32	22	20	12	7	5
More attractive models	13	29	36	10	2	6	8
Increased environmental awareness	34	26	18	12	6	5	3
Government incentives	12	32	22	13	14	6	5
Increased availability of charging stations	10	31	28	12	7	9	7
Changes in societal attitude towards sustainability	12	38	17	18	5	6	8

Source: Primary data

Figure 4.16 Factors that influenced the growth in the purchase of EVs



Source: Primary data

INTERPRETATION

Out of 104 respondents, 32.7% of them ranked increased environmental awareness as the 1st major factor, 36.5% ranked changes in societal attitude towards sustainability as the 2nd major factor and 34.6% ranked more attractive models as the 3rd major factor that influenced the growth in the purchase of EVs.

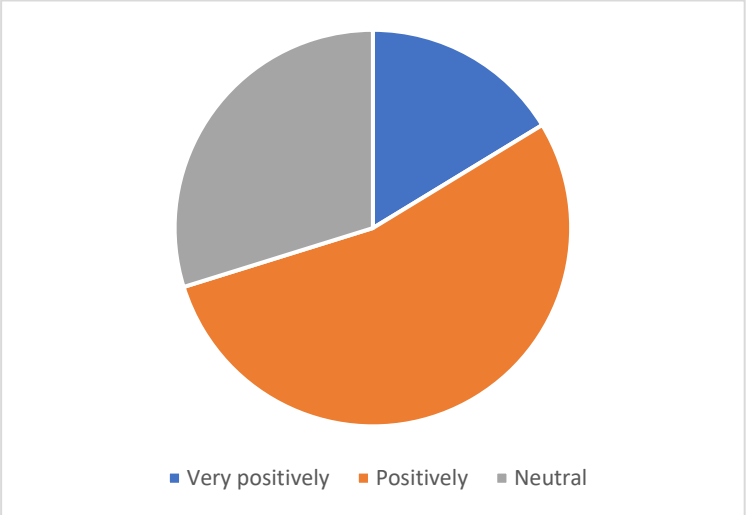
MEDIA'S INFLUENCE IN THE PURCHASE OF EVs

Table 4.17 Media's influence in the purchase of EVs

INFLUENCE	NO. OF RESPONDENTS	PERCENTAGE
Very positively	17	16.3%
Positively	56	53.9%
Neutral	31	29.8%
Negatively	0	0%
Very negatively	0	0%
Total	104	100%

Source: Primary data

Figure 4.17 Media's influence in the purchase of EVs



Source: Primary data

INTERPRETATION

Out of 104 respondents, 53.9% of them states that media has positively influenced, 29.8% states that media has neutrally influenced and 16.3% of them states that media has very positively influenced in the purchase of EVs.

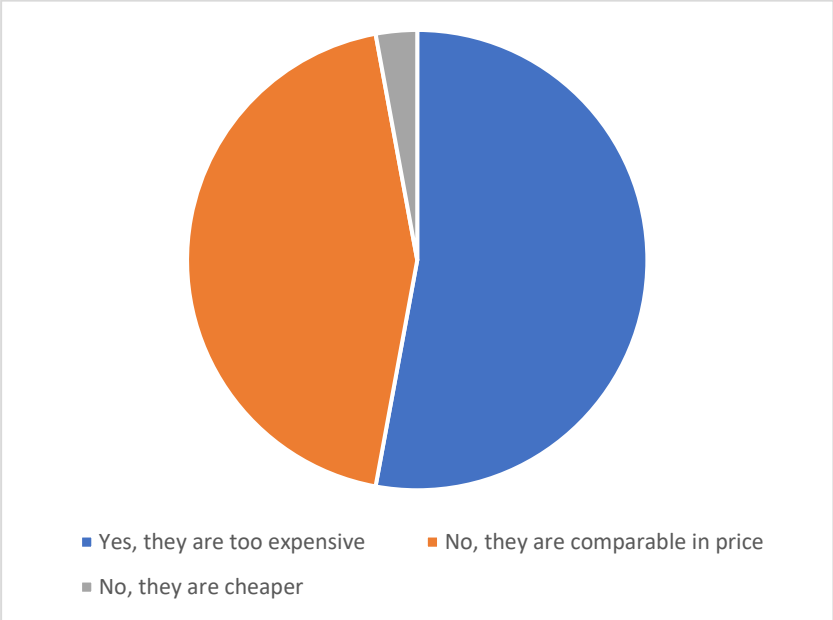
ELECTRIC VEHICLES STILL EXPENSIVE COMPARED TO CONVENTIONAL VEHICLE

Table 4.18 Electric vehicles still expensive compared conventional vehicles

RESPONSE	NO. OF RESPONDENTS	PERCENTAGE
Yes, they are too expensive	55	52.9%
No, they are comparable in price	46	44.2%
No, they are cheaper	3	2.9%
Total	104	100%

Source: Primary data

Figure 4.18 Electric vehicles still expensive compared conventional vehicles



Source: Primary data

INTERPRETATION

Out of 104 respondents, 52.9% of them states that electric vehicles are still too expensive, 44.2% states they are comparable in price and 2.9% states that they are cheaper compared to conventional vehicles.

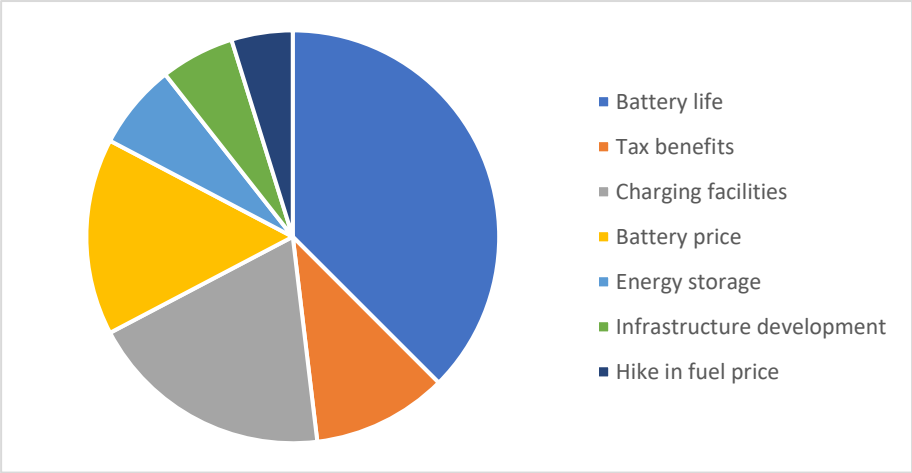
CHANGES NEEDED TO ENCOURAGE PEOPLE TO PURCHASE EV IN THE FUTURE

Table 4.19 Changes needed to encourage people to purchase EV in the future

CHANGES	NO. OF RESPONDENTS	PERCENTAGE
Battery life	39	37.5%
Tax benefits	11	10.6%
Charging facilities	20	19.2%
Battery price	16	15.4%
Energy storage	7	6.7%
Infrastructure development	6	5.8%
Hike in fuel price	5	4.8%
Total	104	100%

Source: Primary data

Figure 4.19 Changes needed to encourage people to purchase EV in the future



Source: Primary data

INTERPRETATION

Out of 104 respondents, 37.5% of them suggests changes in battery life, 19.2% suggests changes in charging facilities, 15.4% suggests changes in battery price, 10.6% suggests changes in tax benefits, 6.7% suggests changes in energy storage, 5.8% suggests infrastructure development and 4.8% suggest hike in fuel price could encourage the people to purchase EV in the future.

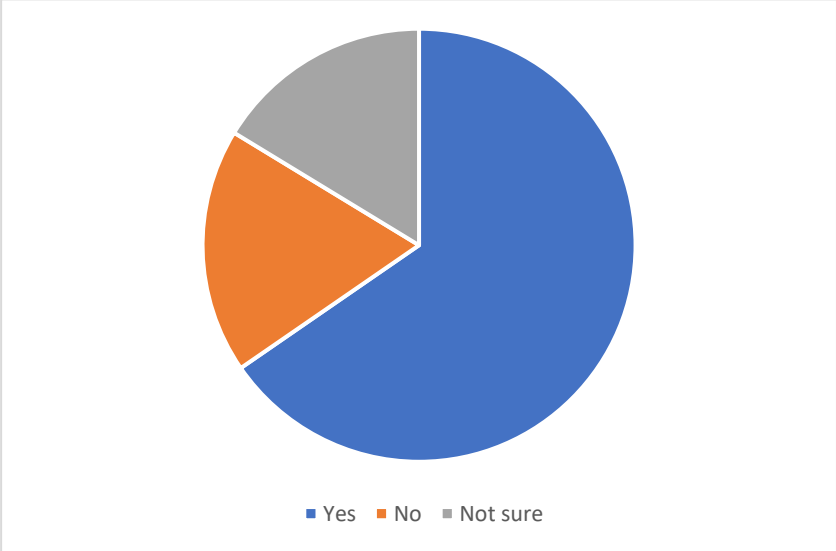
CONCERNS ABOUT THE LONG-TERM DURABILITY OF EV BATTERIES

Table 4.20 Concerns about the long-term durability of EV batteries

RESPONSE	NO. OF RESPONDENTS	PERCENTAGE
Yes	68	65.4%
No	19	18.3%
Not sure	17	16.3%
Total	104	100%

Source: Primary data

Figure 4.20 Concerns about the long-term durability of EV batteries



Source: Primary data

INTERPRETATION

Out of 104 respondents, 65.4% of them responded positively 18.3% responded negatively and 16.3% are not sure about their concerns towards the long-term durability of EV batteries.

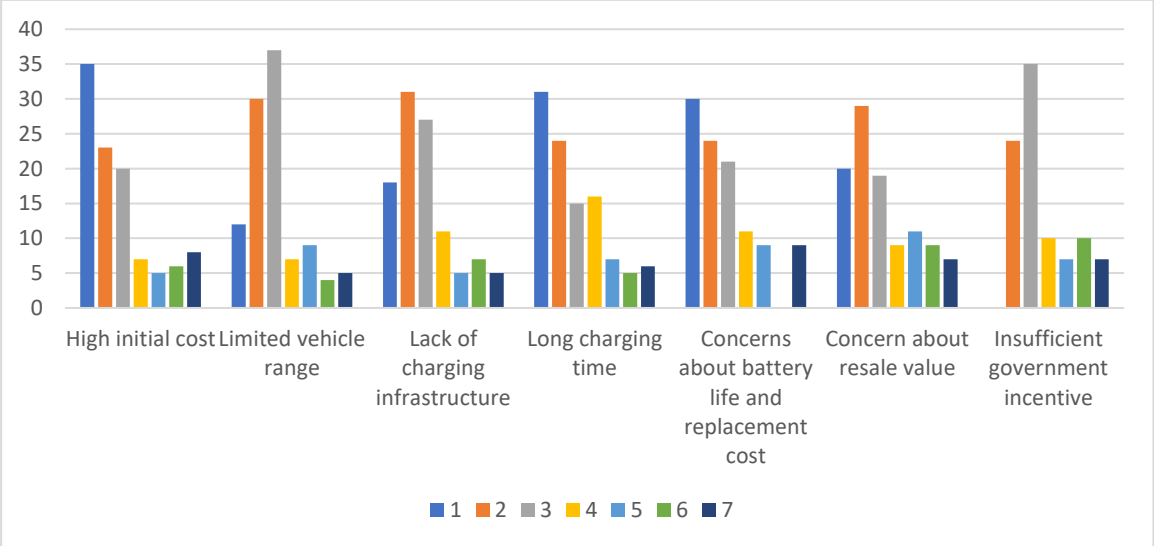
FACTORS THAT PREVENT PEOPLE FROM PURCHASING ELECTRIC VEHICLE

Table 4.21 Factors that prevent people from purchasing electric vehicle

FACTORS	1	2	3	4	5	6	7
High initial cost	35	23	20	7	5	6	8
Limited vehicle range	12	30	37	7	9	4	5
Lack of charging infrastructure	18	31	27	11	5	7	5
Long charging time	31	24	15	16	7	5	6
Concerns about battery life and replacement cost	30	24	21	11	9	0	9
Concern about resale value	20	29	19	9	11	9	7
Insufficient government incentive	11	24	35	10	7	10	7

Source: Primary data

Figure 4.21 Factors that prevent people from purchasing electric vehicle



Source: Primary data

INTERPRETATION

Out of 104 respondents, 33.6% of them ranked high initial cost as the 1st major factor, 29.8% ranked lack of charging infrastructure as the 2nd major factor, 35.6% ranked limited vehicle range as the 3rd major factor that prevent people from purchasing electric vehicle.

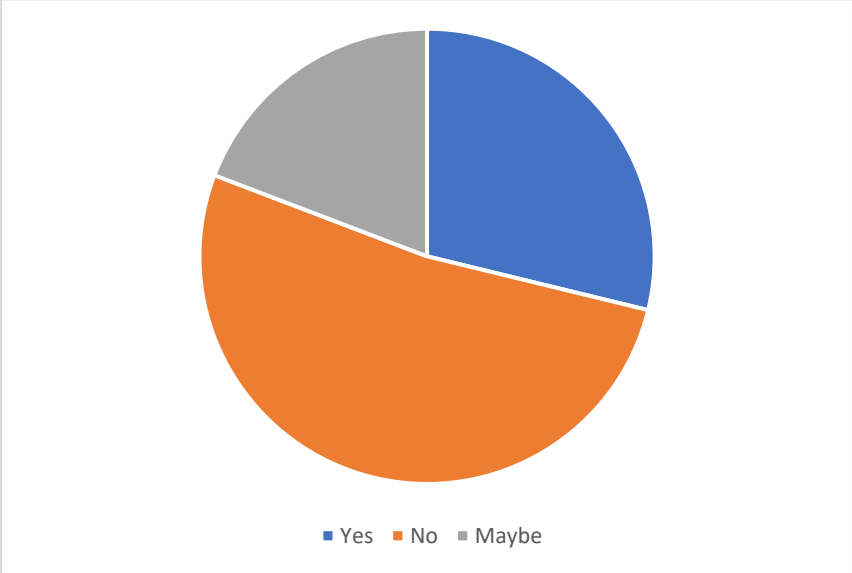
COMPROMISING THE PERFORMANCE OF ELECTRIC VEHICLE FOR A LOWER PRICE

Table 4.22 Compromising the performance of electric vehicle for a lower price

RESPONSE	NO. OF RESPONDENTS	PERCENTAGE
Yes	30	28.8%
No	54	52%
Maybe	20	19.2%
Total	104	100%

Source: Primary data

Figure 4.22 Compromising the performance of electric vehicle for a lower price



Source: Primary data

INTERPRETATION

Out of 104 respondents, 52% of them are not willing to compromise, 28.8% are willing to compromise and 19.2% may/may not be willing to compromise the performance of electric vehicle for a lower price.

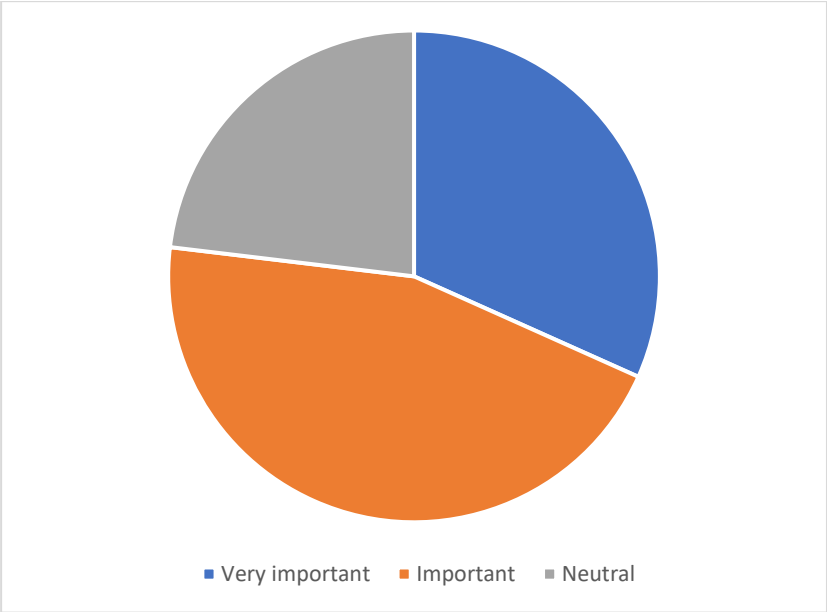
IMPORTANCE OF AVAILABILITY OF CHARGING STATIONS WHILE CONSIDERING PURCHASE OF EV

Table 4.23 Importance of availability of charging station while considering purchase of EV

IMPORTANCE	NO. OF RESPONDENTS	PERCENTAGE
Very important	33	31.7%
Important	47	45.2%
Neutral	24	23.1%
Not at all important	0	0%
Total	104	100%

Source: Primary data

Figure 4.23 Importance of availability of charging station while considering purchase of EV



Source: Primary data

INTERPRETATION

Out 104 respondents, 45.2% of them states that it is important on the availability of charging stations in their locality while considering purchase of electric vehicle, 31.7% states that it is very important, 23.1% of them states that it has neutral importance.

CHAPTER 5

FINDINGS, SUGGESTIONS AND CONCLUSION

FINDINGS

- Majority of the respondents are between the ages of 18 – 30, showing a younger age group interest.
- Gender has almost an equal split with a minor male predominance.
- Majority of the respondents have jobs as employees.
- Majority of the respondents earn up to 1 lakh per year, reflecting a large lower-income group.
- Conventional vehicle users outstrip electric vehicle users demonstrating a clear preference for conventional vehicles.
- Majority of respondents are very familiar with electric vehicles, which shows increased awareness.
- Overall perception on electric vehicle is positive.
- Majority of respondents think electric vehicles are a real alternative to conventional vehicles.
- Environmental friendliness followed by advanced technology is the biggest benefit of electric vehicles.
- Fuel cost savings is a strong driver of electric vehicle purchase.
- Majority of the respondents agree that government incentives encourage EV purchases, although some are unsure and a few disagree.
- Limited vehicle range, high upfront cost and absence of charging infrastructure are the major deterrents.
- Access to charging points is an important consideration, with majority of the respondents regarding it as a significant factor in buying electric vehicles.
- Media generally has a positive effect that influence in purchase of electric vehicle.
- Battery technology and charging infrastructure are regarded as the most needed improvements.

RECOMMENDATIONS

- Explore subsidies or financing programs that make electric vehicles more affordable to lower-income individuals.
- Implement policies to reduce the cost of electric vehicle batteries, making them more affordable overall.
- Increase charging infrastructure to enhance accessibility and mitigate the issues with limited driving range.
- Invest in research and development to improve battery technology, increase range and speed up charging times.
- Enhance government policies to provide tax benefits and incentives to promote the adoption of electric vehicles.
- Encourage innovation in energy storage technology and eco-friendly battery disposal.
- Implement effective battery repurposing and recycling systems to minimize environmental footprint and decrease overall expenditure.
- Launch battery leasing programs that decouple the cost of batteries from the cost of vehicles, thus making the purchase more affordable.

CONCLUSION

The research examines the attitude of the young people towards electric vehicles. While they are familiar with and mostly approve of electric vehicles, conventional vehicles are preferred because electric vehicles are costly, have low range and do not have sufficient charging points. Though others appreciate the fuel cost savings and contribution to the environment, worries about battery longevity, replacement price and restricted charging points dissuade them from converting. Incentives from the government have been mixed with some people finding them useful and others uncertain whether they are effective, pointing to an area where there is a need for improved communication and simplified availability of such advantages.

To overcome these challenges, exploring subsidies, innovative financing and battery leasing strategies might make electric vehicles more within reach, particularly for lower-income people. Upgrading battery technology, increasing charging stations and lowering costs can render electric vehicles more convenient and appealing. Future studies should assess the impact of current policies, factor in regional infrastructure differences and determine consumer behaviour to enable widespread adoption of electric vehicles

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ANNEXURE

I. Demographic factors

1. Age
    - 18 – 30
    - 31-50
    - Above 50

2. Gender
    - Female
    - Male
    - Others

3. Occupation
    - Business
    - Profession
    - Employee
    - Student
    - Others

4. Annual Income
    - Up to 1 lakh
    - 1 lakh – 3 lakhs
    - 3 lakhs – 5 lakhs
    - 5 lakhs – 10 lakhs
    - Above 10 lakhs

II. Perception of customers towards electric vehicles

5. Are you an electric vehicle user?
    - Yes
    - No

6. How familiar are you with electric vehicles?
    - Very familiar
    - Somewhat familiar
    - Not familiar at all

7. What is your general perception on electric vehicles?
    - Very positive
    - Positive
    - Neutral
    - Negative
    - Very negative
8. Do you think electric vehicles are good alternative to conventional (petrol/diesel) vehicles?
    - Yes
    - No
    - Not sure

9. What do you think is the primary advantage of electric vehicles?
    - Cost efficiency
    - Environmental friendliness
    - Advanced technology
    - Other (specify): _____

III. Factors influencing purchasing of EV

10. Which among the following you prefer the most?
    - Fully electric
    - Plug-in hybrid
    - Gasoline vehicle

11. Which of the following would you prioritize when considering the purchase of an electric vehicle?
    - Cost
    - Environmental impacts
    - Technology
    - Performance

12. What would be the factors that influence you the most to purchase an electric vehicle? (Rank them according to your priorities)
    - Price of the vehicle
    - Fuel cost savings
    - Environmental impacts
    - Availability of charging infrastructure
    - Vehicle range
    - Advanced features
    - Government incentives

13. Would government incentives encourage the public to purchase an electric vehicle?
    - Yes
    - No
    - Maybe

14. How likely would people be to purchase an electric vehicle if they had easy access to charging stations?
    - Very likely
    - Likely
    - Neutral
    - Unlikely
    - Very unlikely

IV. Reasons for the increase in the purchase of EV

15. How do you think advancements in EV charging technology have influenced the growth of EVs?
    - Greatly
    - Somewhat
    - Not much
    - Not at all

16. What could be the factors that has contributed most to the growth in the purchase of electric vehicles? (Rank them according to your priorities)
    - Improved battery technology
    - Decrease in price
    - More attractive models
    - Increased environmental awareness
    - Government incentives
    - Increased availability of charging stations
    - Changes in societal attitudes towards sustainability

17. In your opinion how has the media influenced people's decision to buy electric vehicles?
    - Very positively
    - Positively
    - Neutral
    - Negatively
    - Very negatively

18. Do you think electric vehicles are still too expensive compared to petrol/diesel vehicles?
    - Yes, they are too expensive
    - No, they are comparable in price
    - No, they are cheaper

19. What changes are needed to encourage people to buy an electric vehicle in the near future?
    - Battery life
    - Tax benefits
    - Charging facilities
    - Battery price
    - Energy storage
    - Infrastructure development
    - Hike in fuel price

V. Factors restricting customers from purchasing EV

20. Do you have concerns about the long-term durability of electric vehicle batteries?
    - Yes
    - No
    - Not sure

21. What are the factors that prevents people from purchasing an electric vehicle? (Rank them according to your priorities)
    - High initial cost
    - Limited vehicle range
    - Lack of charging infrastructure
    - Long charging time
    - Concerns about battery life and replacement costs
    - Insufficient government incentives
    - Concern about its resale value

22. Would you be willing to compromise on the performance if it meant a significantly lower price for an electric vehicle?
    - Yes
    - No
    - Maybe

23. By considering the locality you live how important is the availability of charging stations in your decision-making process when considering an electric vehicle?
    - Very Important
    - Important
    - Neutral
    - Not at all important