# MAJOR RESEARCH PROJECT

# A STUDY ON CONSUMER BUYING BEHAVIOUR TOWARDS ELECTRIC VEHICLES

**Submitted by:**

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# CERTIFICATE

This is to certify that **TANVI GUPTA 2K21/DMBA/133** have completed the project titled **"A STUDY ON CONSUMER BEHAVIOUR TOWARDS ELECTRIC VEHICLES"** under the guidance of Dr. Archana Singh as a part of Master of Business Administration (MBA) curriculum of Delhi School of Management, New Delhi during the academic year 2022-23. This is an original piece of work and has not been submitted elsewhere.

Dr. Archana Singh
Head of Department
Delhi School of Management
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# DECLARATION

I, **TANVI GUPTA** student of Delhi School of Management, Delhi Technological University hereby declare that the major research project on **A STUDY ON CONSUMER BEHAVIOUR TOWARDS ELECTRIC VEHICLES** submitted in partial fulfillment of the requirements for the award of the degree of Master of Business Administration (MBA) is the original work conducted by me. I also confirm that neither I nor any other person has submitted this project report to any other institution or university for any other degree or diploma. I further declare that the information collected from various sources has been duly acknowledged in this project.

Name: TANVI GUPTA

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# ACKNOWLEDGEMENT

At the very onset, I offer my sincere thanks and humble regards to Delhi School of Management, Delhi Technological University for imparting me valuable professional training in MBA.

I would sincerely like to thank of building up my confidence, which led to the fulfillment of my project. The completion of this project is due to the help of few individuals whom I cannot let go unhanded.

I wish to express my deep gratitude especially to my guide without whose guidance, support and encouragement. I would have not been able to complete this report that delves cursorily on the aspects of ELECTRIC VEHICLES.

I pay my regards to **Dr. Archana Singh**, my faculty guide for giving me the cream of his knowledge. I am thankful to her as she has been a constant source of advice, motivation and inspiration. I am also thankful to her for giving her suggestions and encouragement throughout the project work.

I take the opportunity to express my gratitude and thanks to our computer Lab staff and library staff for providing me opportunity to utilize their resources for the completion of the project.

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# EXECUTIVE SUMMARY

The executive summary of the study on consumer behavior towards buying electric vehicles (EVs) is as follows:

Despite the many benefits of electric vehicles, their adoption rate has been slower than expected. To address this issue, this study aimed to understand the factors that influence consumer behavior towards buying EVs and how these factors can be leveraged to increase demand for EVs.

The study identified several key factors that influence consumer behavior towards buying EVs, including cost, range anxiety, performance and convenience, environmental and social values, and incentives and policies. These factors interact with each other to shape consumer behavior towards buying EVs.

The study also found that consumer awareness and education about EVs play a significant role in shaping their purchase decision. Improving awareness and education about EVs can increase demand for EVs and accelerate their adoption in the market.

Government policies and incentives can also significantly influence consumer behavior towards buying EVs. The study identified best practices for incentivizing the adoption of EVs, including offering financial incentives, improving charging infrastructure, and promoting public awareness campaigns.

Overall, the study provides insights and recommendations for automakers, policymakers, and other stakeholders in the EV market to increase the adoption of EVs and accelerate the transition to a more sustainable transportation system. By addressing the factors that influence consumer behavior towards buying EVs, it is possible to increase demand for EVs and contribute to a more sustainable future.

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# CHAPTER – 1

# INTRODUCTION

# INTRODUCTION

Electric vehicles (EVs) are becoming increasingly popular as they can be powered entirely or partly by electricity, and have numerous environmental benefits. They can be charged either through an external collector system or a self-contained battery using solar panels, fuel cells or generators. EVs have lower operating costs due to fewer moving parts, which require less maintenance. They are eco-friendly, using minimal fossil fuels such as petrol or diesel. EVs are gaining favour as a means of reducing carbon emissions and preserving the environment. With the advancement of technology, EVs are becoming more accessible to the masses. They are a sustainable solution to transportation and have significant potential to reduce the global carbon footprint. Governments worldwide are encouraging the adoption of EVs through incentives, subsidies and infrastructure development. As a result, the EV market is expanding rapidly, and the future looks promising for electric mobility.

EVs are frequently viewed as a potential substitute for conventional vehicles, with the ability to solve pollution, global warming, and natural resource depletion problems. Electric cars provide an obvious answer to the environmental challenges connected with gasoline-powered automobiles, delivering a more sustainable and environmentally friendly transportation choice for the future. Electric vehicles (EVs) are a new technology that is altering our perceptions of mobility. Electric vehicles (EVs) are fuelled by electricity rather than petrol or diesel fuel, making them more energy-efficient and ecologically benign than traditional combustion engine cars. EVs are powered by electric motors and batteries, resulting in a smooth and quiet ride with reduced emissions.

Electric cars have various advantages over regular vehicles, including lower pollutants, cheaper running costs, and increased performance. EVs emit fewer greenhouse gases than petrol or diesel vehicles, helping to create a cleaner and more sustainable transportation system. Electric cars have lower running expenses than regular automobiles since electricity is often less expensive than petrol or diesel fuel. Additionally, EVs offer better performance, with immediate torque and acceleration, creating a comfortable and responsive driving environment.

Even with all of its benefits, EV adoption has lagged behind expectations. High upfront prices, constrained driving range, a lack of charging infrastructure, and customer views and attitudes towards EVs are a few reasons that contribute to this delayed adoption rate. To solve these obstacles and improve EV adoption, it is critical to study consumer purchasing behaviour. Understanding the elements that drive customer behaviour towards EV purchases allows manufacturers, legislators, and other EV industry players to design strategies and policies to encourage EV adoption and speed the transition to a more sustainable transportation system.

Because of their promise to drastically cut greenhouse gas emissions and address climate change, electric vehicles (EVs) have become a major focus in the automotive industry and throughout the world. EVs are becoming more viable and accessible for everyday usage as battery technology advances and charging infrastructure grows.

Concerns about climate change and air pollution have fuelled the demand for EVs in recent years. Governments and manufacturers throughout the world have set high objectives for EV adoption in the next years, and major expenditures have been made in R&D to enhance battery technology, boost range, and lower EV costs.

Today, there are a wide range of EVs available on the market, from small city cars to luxury SUVs. Most major automakers have introduced at least one EV model, and there are also several new companies that specialize in EV production, such as Tesla and Rivian.

Advancements in EV technology have also led to improvements in charging infrastructure. Public charging stations are becoming more widespread, and home charging options are also available for EV owners. Additionally, advancements in battery technology are leading to faster charging times and longer ranges, making EVs more practical for everyday use. Overall, the background of EVs is one of innovation and progress. While there are still challenges to be overcome, such as cost and range limitations, the push towards a more sustainable transportation system is driving advancements in EV technology and increasing their adoption in the environment.

Consumer behaviour defines the decisions made by an individual's when he/she purchasing products or services. As it involves the study of the factors that influence these actions and decisions, including personal, psychological, social, and cultural

factors. Understanding consumer behaviour is critical for businesses to build effective marketing strategies and produce goods that fit the demands and preferences of their customers.

Consumer behaviour towards buying electric vehicles (EVs) is an important area of research, as the success of EVs in the market largely depends on consumer demand. There are several factors that influence consumer behaviour when it comes to purchasing EVs. When it comes to purchasing electric vehicles (EVs), consumer behaviour plays a critical role in shaping the adoption rate of this emerging technology. Consumer behaviour towards buying EVs is influenced by several factors, including cost, range anxiety, performance and convenience, environmental and social values, and incentives and policies.

The price of electric vehicles is a crucial element that determines customer behaviour. EVs can be more expensive to acquire than typical combustion engine vehicles, which may deter people from purchasing an EV. Another element that might impact customer behaviour towards EVs is range anxiety, or the worry of running out of battery power while driving. Consumers may see EVs' short driving range as a constraint, which may influence their choice to buy an EV.

Incentives and legislation can also influence consumer behaviour when it comes to purchasing EVs. Government regulations and incentives, such as tax credits and rebates, can reduce the cost of EVs and encourage people to buy them. Similarly, the availability of charging infrastructure might influence customer behaviour, since consumers may be more inclined to acquire an EV if convenient charging choices are available.

The cost of the automobile is one of the most important considerations. Many people are put off by the fact that electric vehicles are sometimes more expensive than gasoline-powered vehicles. Tax credits and rebates, on the other hand, can assist to offset the greater cost of EVs and make them more desirable to customers. Furthermore, as battery technology advances, the cost of producing EVs decreases.

Another major consideration is range anxiety, or the concern that the car may run out of power before arriving at its destination. This is particularly important for customers who travel long distances or reside in locations with inadequate charging facilities.

Education and awareness campaigns, as well as improvements in charging infrastructure, can help to alleviate this concern.

Perceived performance and convenience are also important considerations for consumers. EVs are often perceived to have lower performance than gas-powered vehicles, but advancements in EV technology have led to improvements in acceleration and overall performance. Additionally, convenience factors such as ease of charging and maintenance can play a role in consumer behaviour. Finally, environmental concerns and personal values can influence consumer behaviour towards EVs. Many consumers are motivated to purchase EVs as a way to reduce their carbon footprint and contribute to a more sustainable future.

Overall, consumer behaviour towards purchasing EVs is complex and multifaceted. Understanding these factors and addressing consumer concerns can help to increase demand for EVs and accelerate their adoption in the market. This study aims to determine public perception of electric vehicles (EVs) and their potential to reduce vehicular pollution. The growing popularity of EVs is supported by several advantages, including:

- Cost savings: EVs can be fueled at significantly lower prices compared to gasoline-powered vehicles, and many new EVs come with government incentives that provide financial benefits. This can result in potential savings for consumers in their daily lives.

- Convenience: Charging an EV is simple and convenient, as it can be done at home using a standard household outlet. This eliminates the need to stop at gas stations, making EVs more convenient for daily use.

- Safety: Electric vehicles are held to the same standards for safety and testing as conventional cars. EVs are thought to be safer to drive since they provide superior traction on the road because to their lower center of gravity.

- Zero emissions: The most significant environmental advantage of EVs is their lack of harmful emissions. As EVs are powered by electricity, they do not produce any toxic gases or smoke, making them environmentally friendly. This sets them apart from hybrid vehicles that still rely on gasoline and emit pollution.

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- Low maintenance: Compared to conventional gasoline-powered cars, EVs have fewer moving components, which results in less frequent maintenance. EVs become more cost-effective in the long term as a consequence of lower maintenance expenses and fewer trips to the technician.

By highlighting these advantages, this study aims to promote the benefits of EVs as a potential solution to reduce vehicular pollution and create a healthier and more environmentally friendly transportation option for the future.

This project aims to investigate consumer behaviour towards buying EVs, including the key factors that influence their purchase decision, and how these factors can be leveraged to increase demand for EVs. By providing insights and recommendations for increasing the adoption of EVs, this project aims to contribute to a more sustainable and environmentally friendly transportation system.

## Problem Statement

The problem of the study is that despite the many benefits of electric vehicles (EVs), their adoption rate has been slower than expected. While EV sales have been increasing in recent years, they still account for a small percentage of total vehicle sales. This slow adoption rate can be attributed to a range of factors, including cost, range anxiety, charging infrastructure limitations, and lack of consumer awareness and education.

As a result, there is a need to better understand consumer behaviour towards EVs in order to increase their adoption rate. Specifically, the problem of the study is to understand the factors that influence consumer behaviour towards buying EVs and how these factors can be leveraged to increase demand for EVs. By addressing this problem, the study aims to provide insights and recommendations for automakers, policymakers, and other stakeholders in the EV market to increase the adoption of EVs and accelerate the transition to a more sustainable transportation system.

## Objectives of the study

The study's goal is to investigate the elements that impact customer behaviour towards purchasing electric cars (EVs) and how these aspects might be used to enhance EV demand. The study's specific goals are as follows:

- To evaluate the key parameters that influences consumer behaviour towards buying EVs.

- To evaluate the relative importance of these factors in shaping consumer behaviour towards buying EVs, and how they interact with each other.

- To investigate the extent to which consumer awareness and education about EVs influences their purchase decision, and how this can be improved.

- To investigate consumer attitudes towards EV's (electric vehicles).

- To gain insights into the experiences of using EV's (electric vehicles).

By achieving these objectives, the study aims to contribute to a better understanding of consumer behaviour towards buying EVs, and to provide actionable insights and recommendations for increasing the adoption of EVs in the market.

## Scope of the study

The scope of consumer behaviour towards buying electric vehicles (EVs) is broad and covers a range of factors that influence purchase decisions. These include:

- **Cost**: The cost of an EV is often a significant consideration for consumers, as they are typically more expensive than gas-powered vehicles. Consumer behaviour research in this area focuses on the willingness to pay for EVs and the factors that influence perceptions of value.

- **Range anxiety**: Range anxiety is the worry that an EV won't have enough charge to go where it's going. Research in this field examines how education and awareness efforts, as well as improvements in charging infrastructure, may assist to allay customers' range anxiety, which studies have proven to be a substantial worry.

- **Performance and convenience:** Consumer behaviour research in this area looks at how perceptions of EV performance and convenience influence purchase decisions. This includes factors such as acceleration, driving experience, and charging time and location.

- **Environmental and social values:** Many consumers are motivated to purchase EVs as a way to reduce their carbon footprint and contribute to a more sustainable future. Research in this area looks at how environmental and social values influence purchase decisions and how these values can be leveraged to increase demand for EVs.

- **Incentives and policies:** Government incentives and policies can significantly influence consumer behaviour towards EVs. Consumer behaviour research in this area looks at the effectiveness of these policies and the factors that influence their impact on consumer demand.

Overall, the scope of consumer behaviour towards buying EVs is complex and multifaceted, and involves a range of factors that influence purchase decisions. Understanding these factors is important for automakers, policymakers, and other stakeholders in the EV market in order to increase demand for EVs and accelerate their adoption in the market.



**Fig. 3.1**

# CHAPTER – 2

# LITERATURE REVIEW

# LITERATURE REVIEW

A detailed synthesis of relevant academic papers and other materials on a given subject is known as a literature review. In the literature study, these sources—which could also include books, government reports, websites, and other sources—are listed, succinctly summarised, and evaluated. A literature review is often included as a separate section in a graduate thesis or dissertation. A wide range of topics, including EV technology, governmental laws and regulations, consumer behaviour, and environmental and economic implications, are covered in the large literature on electric cars (EVs). The research as a whole emphasises how effective EVs may be in reducing greenhouse gas emissions and combating climate change. However, issues like high costs, limited range, and inadequate charging infrastructure still need to be resolved, and it's critical to carefully consider governmental policies and regulations.

Eric Molin and Bert van Wee conducted a study that suggests consumers have a preference for electric vehicles due to their potential to address issues such as pollution, global warming, and oil reliance. However, despite significant government marketing initiatives, the penetration of electric vehicles is low. The study provides an overview of previous research on consumer preferences for electric vehicles and identifies psychological and economic factors that influence their purchasing decisions. The study finds that factors such as initial and recurring costs, driving range, charging time, vehicle performance, and brand variety all impact the utility of electric cars. Availability of charging stations, as well as tax breaks and incentives, positively affect the promotion and utility of electric cars. The study aims to support policymakers and guide future research on this topic. (2017 Fanchao Liao)

Morton, Anabel, and Nelson conducted a study on consumer preferences towards Electric Vehicles (EVs), which are crucial for government policies aimed at transitioning to a low-carbon mobility system. The study explored the various emotional and non-conscious regulatory processes that impact individual adoption intentions and behaviors regarding EVs, using psychological theories. However, there is limited consensus on the specific factors that have a direct or indirect influence on

consumer preferences for EVs. To address this gap, the study examined the influence of consumer innovation and attitudes towards the functional features of EVs on stated preferences for these cars, using a conceptual framework. (JD 2016)

Afroz, Rahman, Masud, Akhtar, and Duasa conducted a study to investigate the impact of individual values and attitudes on customers' purchase intention of electric automobiles. The study examined how attitudes towards environmentally conscious Electric Vehicle (EV) purchasing intentions (PIN) are influenced by environmental concern norms (ECNs) and informational concern norms (ICNs). The findings revealed that people are more inclined to select solutions that maximize utility based on their preferences, awareness of options, and budgetary restrictions. The study also showed a negative correlation between ICNs and green PIN. When selecting a car, consumers consider factors such as fuel economy, fuel consumption, comfort within their budget, and the ease of recycling or charging. As a result, car manufacturers should consider these factors when designing electric vehicles (EVs). (JD 2016)

The European Journal of Marketing published a study in 2018, which developed a model to assess how consumer attitudes towards electric vehicles (EVs) are influenced by two factors: self-image congruence (SIC) and product user stereotypes. The study examined how negative stereotypes about EV owners held by individuals who have not had any experience with EVs, and their SIC related to EV ownership, can affect their attitudes towards EVs. Both product user stereotypes and SIC were found to be potential predictors of customer attitudes and were seen to have an immediate impact on attitudes. The study also explored the correlation between attitudes and the desire to purchase EVs. The model was tested by analyzing data collected from research participants who played a game simulating the role of an EV driver, both before and after the game, and the results were calculated by Vijayagopal in 2018.

Important elements affecting consumers' decisions to buy electric vehicles: by Yang, C., Tu, J. C., & (2019) Customers need to adopt the new trend of electric vehicles (EVs) gradually because of their critical role in resolving environmental issues. Due to ignorance, buyers frequently adopt a cautious approach towards novel items, delaying purchases until concerns are cleared up. Manufacturers should act proactively to meet customer demands in order to encourage EV adoption. Consumers' perceptions of EVs as technologically cutting-edge and cost-competitive with conventional

vehicles have a beneficial impact on their decision-making. Personal innovativeness, on the other hand, has a negative impact, suggesting that customers may not prioritise EVs if they believe they are less knowledgeable than their peers. (Yang, C., 2019).

Electric vehicle perception and its effect on consumer preference: by M. Ghasri, A. Ardeshiri, & T. Rashidi (2019) When, how, and to what degree a new technology gets embraced by consumers depends heavily on how better it is considered to an older technology that it is replacing. Economic and psychological research on customer preferences for electric vehicles (EVs) are two categories that may be used to group this information. The most widely used approach in economic research is discrete choice modelling, which is consistent with the notion of utility maximisation. Early in the history of batteries, in the early 18th century, electric motors were used for propulsion in EVs. (Note: Historical information or general knowledge are not necessary.)

"Study on India's Electric Vehicle Opportunities and Challenges, by Mohamed M., G. Tamil Arasan, and G. Sivakumar" Electric engines might replace internal combustion engines (ICE) to a significant extent, reducing pollution and providing economical benefits to users. This technique has already been used by several nations, leading to favourable environmental results. A research was done to look at the benefits and drawbacks of using electric vehicles (EVs) in India, taking into account things like government efforts, batteries, industry, and the environment. The demand for EVs in India as well as their price and efficiency were considered. Reduced greenhouse gas emissions and cheaper oil prices are the main drivers for EV adoption in India. It is important for the government to capitalize on the opportunities presented by EVs and address relevant challenges with appropriate solutions. (Mohamed M, 2018)

"Pretty Bhalla, Inas Salamah Ali, Afroze Nazneen, et al. conducted a study on consumer perception and purchase intention of electric automobiles." No matter if choosing a conventional automobile or an electric vehicle (EV), a number of elements, including environmental considerations, cost, comfort, trust, technology, social acceptability, and infrastructure availability, play a vital impact. These factors have been supported by research as direct influencers of individuals' vehicle choices. The study suggests that EV producers and governments should prioritize increasing the social acceptability of EVs by investing in infrastructure development and

technological advancements to build consumer trust. The results also show that the public is aware about the environmental advantages of EVs, highlighting the joint obligation of the government and industry to invest in EV production. 2018's Pretty Bhalla

The Indian market may not require significant changes, and instead, small-scale improvements could be made to address local load concerns. The use of home charging options can be encouraged as an alternative to building large-scale charging infrastructure. Careful planning is necessary before constructing charging stations, considering factors such as location, population, traffic congestion, and safety. The transportation and energy sectors must be integrated to operate efficiently. To accelerate the growth of the market, financial incentives could be offered to consumers, such as tax rebates, subsidies, reduced tolls, free parking, and access to restricted highway lanes. (Dash & Kumar, 2013)

The researchers also found that the use of hybrid vehicles could provide a suitable compromise between conventional and electric vehicles for urban distribution centres. Hybrid vehicles could offer significant fuel savings while maintaining the operational flexibility required in urban logistics. However, the suitability of the vehicle type depends on the specific needs of the distribution centre, such as the distance and frequency of trips, as well as the availability of charging infrastructure. Ultimately, the decision on which vehicle type is best for an urban distribution centre must consider various factors, including cost, environmental impact, and operational requirements. (2020) De Cauwer, C., Lebeau, P., Van Mierlo, J., & Macharis, C..

India's Electric Vehicles: Overview and Challenges by Dr. Sanjeev Kumar Padmanaban, Mr. A. Rakesh Kumar, The adoption of electric vehicles (EVs) has become a key endeavour in light of the rising global pollution and the urgent need to cut $CO_2$ emissions to safeguard the environment. Since transport contributes significantly to $CO_2$ emissions, it is crucial to take action to reduce emissions. According to the National Electric Mobility Mission Plan 2020, which contains an in-depth study on EVs, the Indian government has established ambitious plans to promote EVs in the nation and keep up with worldwide trends. To transition from internal combustion engines to electric vehicles, India must overcome substantial obstacles, which will need enormous planning and research and development (R&D) activities.

Building robust charging infrastructure is crucial to address range anxiety among EV users, and laying a strong foundation is essential for successful EV adoption in India.

Potential Customers' Perceptions and Awareness of Electric Vehicles: Masurali.A, Surya P, The transport industry in India alone accounts for more than 18% of carbon emissions, making it critical to discover viable alternative options. With several automakers offering EVs and expanding their product lines, electric cars (EVs) have emerged as a possible solution to these difficulties. Promoting electric vehicles may help reduce reliance on fossil fuels and minimise pollution, which benefits both customers and the government. Education levels have a huge effect on EV awareness, and it is critical for both manufacturers and the government to work together to improve knowledge and build good impressions among potential purchasers. Masurali, A. (2018)

The electric vehicle market evaluation in India including consumer viewpoint, policies, and issues: Makarand M. Lokhande, Varsha A. Shah, and Pritam K. Gujarati, Less than 0.1 percent of automobiles in India are now electric or plug-in hybrids, with the bulk of vehicles still using fossil fuels as their primary source of propulsion. Through the release of greenhouse gases, these fossil fuels contribute to atmospheric deterioration and global warming. In addition, India imports around 70% of the oil it requires annually, indicating the widening gap between supply and demand for petroleum. In light of this situation, it is urgent to look at more environmentally friendly options while also addressing the difficulties and barriers that would need to be overcome in order for them to be adopted. (Pritam K. Gujarati, 2018).

Driving an electric vehicle. M. Pierre, C. Jemelin, and N. Louvet - Energy Efficiency, 2011 - Pioneer users: a sociological study Similar instances, perhaps on a lesser scale but nonetheless full of learning, have occurred during the previous few decades. For example, in the 1990s, several local governments financed the development of electric automotive technology, and some commuters chose to use these vehicles on a daily basis. We will present research from 2006 to 2008 in order to understand the causes of this unusual modal choice, emphasise the challenges that electric car users experienced at the time, and analyse the usage patterns that affected their mobility and use of electric vehicles. 2011 (M. Pierre)

Rezvani, Jansson, and Bodin (2015) explore current developments in customer acceptance of electric vehicles. They present an overview of the EV adoption research, however they only focus on specific psychological factors that impact people's willingness to accept electric vehicles, and they select only a few common studies. Our review contributes in two ways: first, we examine a broader range of variables that influence electric vehicle adoption than just psychological ones; and second, we compile all available academic studies on electric vehicle preferences to provide a comprehensive overview of the state of the field. (Bodin, 2015).



Electric vehicles are changing the future of auto maintenance

**Fig. 2.1**
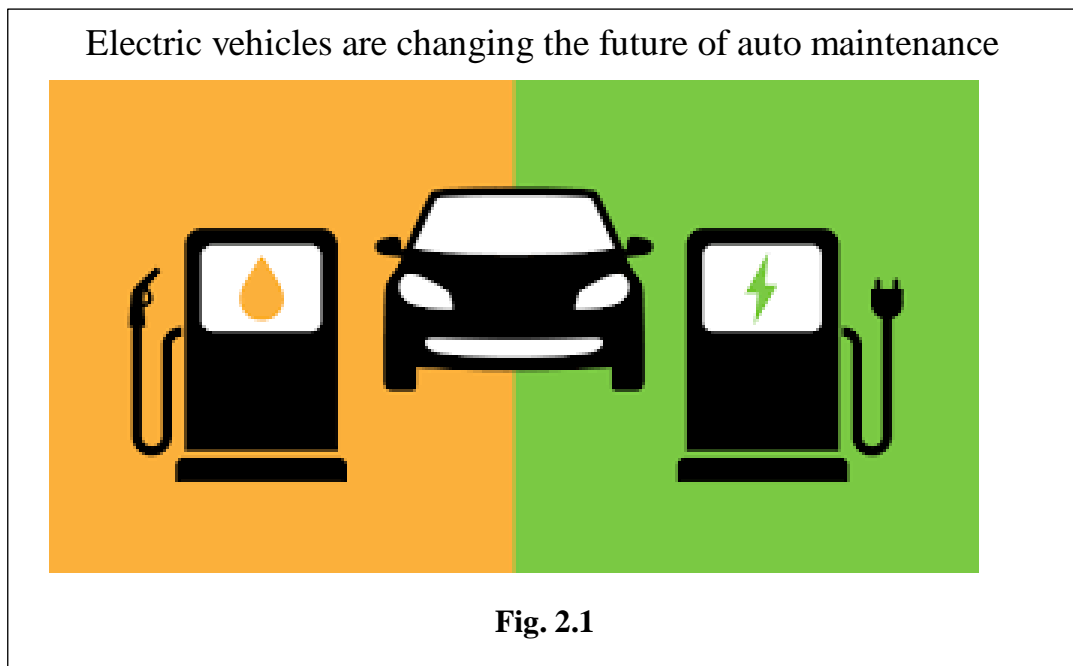
**Electric Car Reason**



**Fig. 2.2**

# CHAPTER 3

# RESEARCH METHODOLOGY

# RESEARCH METHODOLOGY

The project's study methodology on consumer attitudes towards purchasing electric cars (EVs) combines qualitative and quantitative research techniques to collect and assess data. The study technique is made to give a thorough knowledge of the elements, such as individual, psychological, social, and cultural ones, that affect consumers' decisions to purchase electric vehicles.

The following are the key steps involved in the research methodology of the project:

- **Research Design:** For this study research design combines exploratory and descriptive research methods. Exploratory research involves a review of existing literature on consumer behavior towards purchasing electric vehicles, while descriptive research involves the collection and analysis of data through surveys.

- **Sampling**: In this report the sampling method used for the project is a convenience sampling technique. Participants for the survey will be taken from various online platforms and social media groups.

- **Data Collection:** The data collection method involves two techniques: surveys. A survey questionnaire will be designed and distributed to a sample of potential EV buyers to gather quantitative data. The questionnaire will be designed to collect information on the factors that influence consumer behaviour towards buying EVs.

  o Primary data: Respondents who completed the online survey were randomly selected to provide the primary data for this study. The purpose of the questionnaire was to gather data on the variables that affect customer decisions to purchase EVs.

  o Secondary data: This study's secondary data was gathered from widely used encyclopedias and a variety of websites that offer more details on consumer attitudes regarding EV purchases.

- **Data Analysis:** Both descriptive and inferential statistical techniques will be used to examine the data obtained from the surveys and interviews.

  - Descriptive Statistics: The data gathered from the surveys will be summarized using descriptive statistics.

  - Inferential Statistics: To test the hypotheses and correlations between the variables, inferential statistics will be utilized. Regression analysis and other statistical tests will be performed to analyses the data.

- **Results and Conclusion:** The results of the data analysis will be presented in the form of tables, charts, and graphs. The findings will be discussed and interpreted to draw conclusions and provide recommendations for increasing the adoption of EVs.

## Tools for data collection

Data collection tools are the devices or instruments used to gather data for research purposes. In this study, a well-structured questionnaire is used as the primary data collection tool. The questionnaire is designed to collect data from the respondents, and its effectiveness and quality will have a significant impact on the success of the research. It is important to ensure that the questionnaire is carefully designed, validated, and administered to collect reliable and accurate data for the research study.

## Sampling design and size

The sample is chosen using a stratified sampling method. The sample is restricted to 65 people.

Overall, the research methodology of the project is designed to provide a comprehensive understanding of consumer behaviour towards buying EVs and to provide actionable insights and recommendations for increasing the adoption of EVs in the market. A total of 65 replies were obtained from the respondents after online questionnaires were sent as part of the study.

# CHAPTER 4

# DATA ANALYSIS & INTREPRETATION

**"GENDER OF RESPONDENTS"**

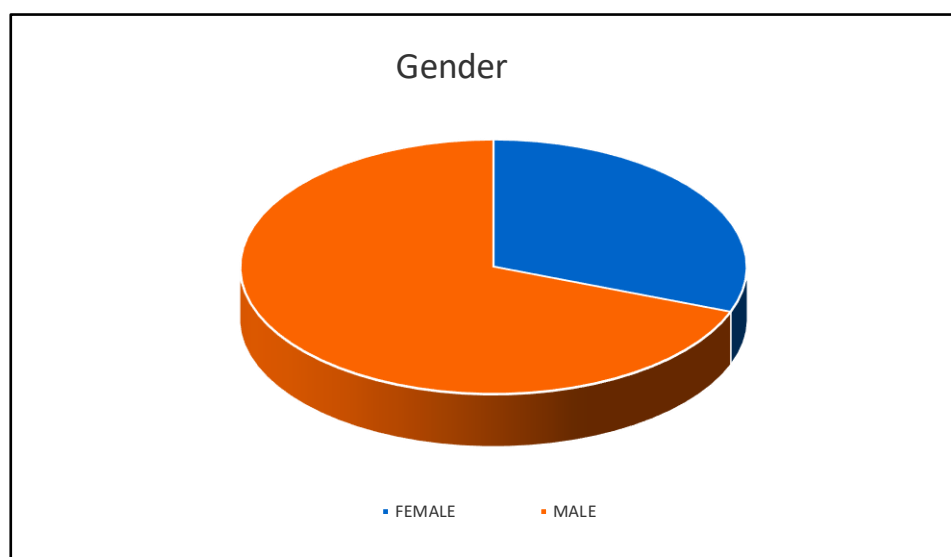| Gender | No of respondents | % of respondents |
|--------|-------------------|------------------|
| FEMALE | 20 | 30.77% |
| MALE | 45 | 69.23% |
| TOTAL | 65 | 100% |

Table 4.1



Fig 4.1

**INTERPRETATION**

The following data was collected from 65 respondents:

- 30.77% of the respondents identified as male.
- 60% of the respondents identified as female.

## "AGE GROUP OF THE RESPONDENTS"

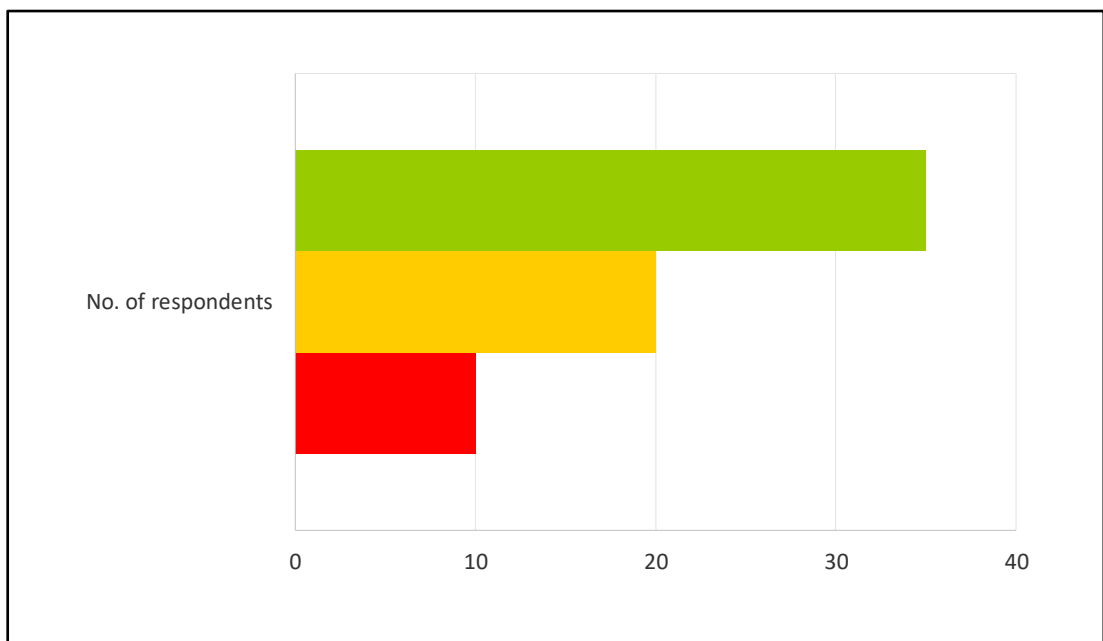| Age groups | No. of respondents | % of respondents |
|:---:|:---:|:---:|
| 18-21 | 10 | 15% |
| 22-24 | 20 | 31% |
| 24 and above | 35 | 54% |
| Total | 65 | 100% |

Table 4.2



Fig 4.2

## INTERPRETATION

The primary data was collected from 65 respondents and the distribution of respondents across different age categories is as follows:

- 15% of respondents belong to the 18-21 age category.
- 31% of respondents belong to the 22-24 age category.
- 54% of respondents belong to the 24 & above age category.

**"DO YOU HAVE ANY OF THE FOLLOWING VEHICLE"**

- Bike

- Scooter

- All of the above

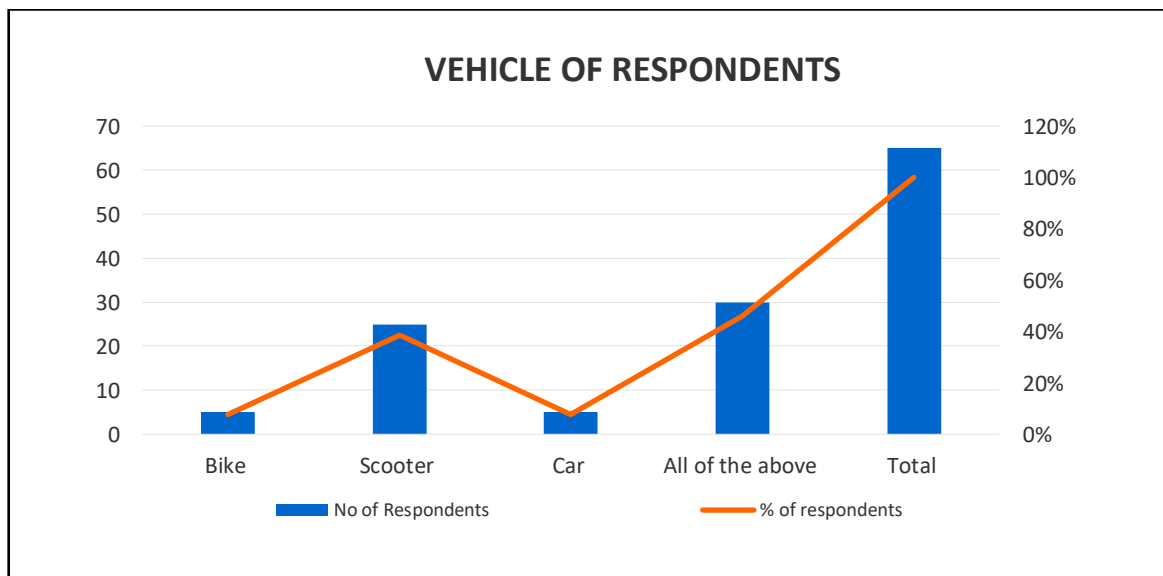| Particulars | No of Respondents | % of respondents |
|---|---|---|
| Bike | 5 | 8% |
| Scooter | 25 | 38% |
| Car | 5 | 8% |
| All of the above | 30 | 46% |
| Total | 65 | 100% |

Table 4.3



Fig 4.3

## INTERPRETATION

The data was collected from a sample of 65 respondents, with the following distribution: 8% of respondents own a bike, 38% own a scooter, 8% own a car, and 46% own all three (bike, scooter, and car).

**"WHICH FUEL DO YOU USE IN YOUR VEHICLE"**

- Petrol
- Diesel
- Charging

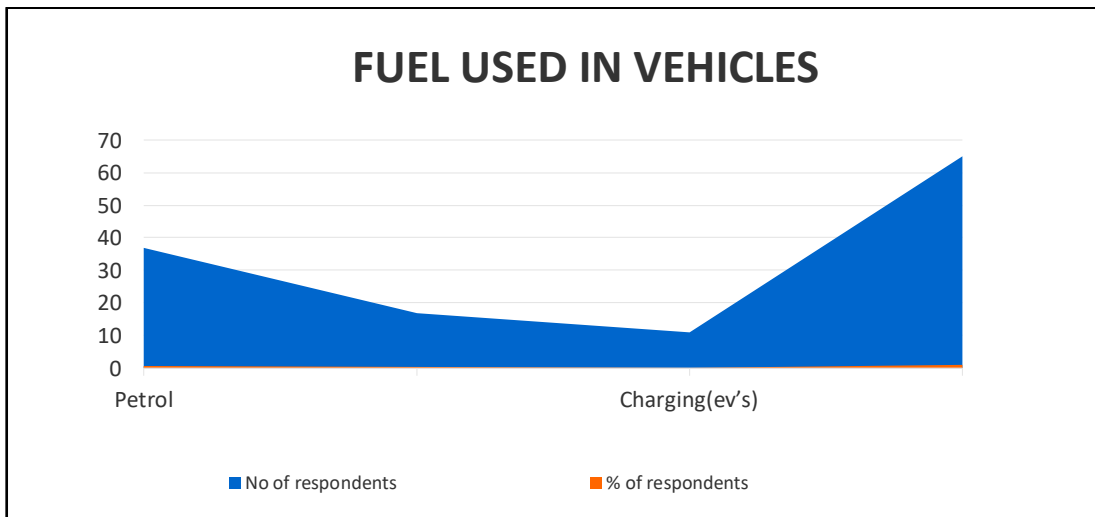| Particular | No of respondents | % of respondents |
|:---:|:---:|:---:|
| Petrol | 37 | 57% |
| Diesel | 17 | 26% |
| Charging(ev's) | 11 | 17% |
| Total | 65 | 100% |

Table 4.4



Fig 4.4

**INTERPRETATION**

The data collected for this study is based on responses from 65 respondents.

- 57% of respondents use petrol as a fuel in their vehicle.

- 26% of respondents use diesel as a fuel in their vehicle.

- 17% of respondents use Charging EV's as a fuel in their vehicle.

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**"ARE YOU AWARE OF ELECTRIC VEHICLE"**

- Yes
- No
- Maybe

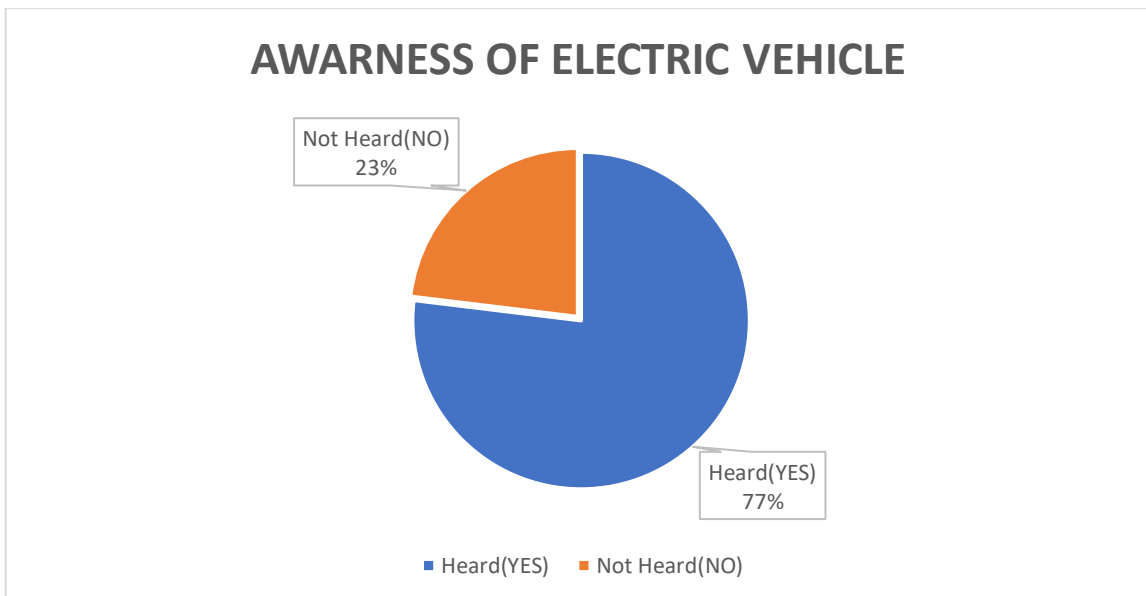| Particulars | No of respondents | % of respondents |
|:-----------:|:-----------------:|:----------------:|
| Heard(YES) | 50 | 77% |
| Not Heard(NO) | 15 | 23% |
| TOTAL | 65 | 100 |

Table 4.5



Fig 4.5

**INTERPRETATION**

The data collected for this study is based on responses from 65 respondents. Based on the responses from the respondents, it was found that 77% of them have heard about electric vehicles, while only 23% of respondents have not heard about electric vehicles.

**"FROM WHERE DID YOU HEARD ABOUT ELECTRIC VEHICLES"**

- Friends and Family
- Newspaper
- Advertisement
- Social Media
- Others

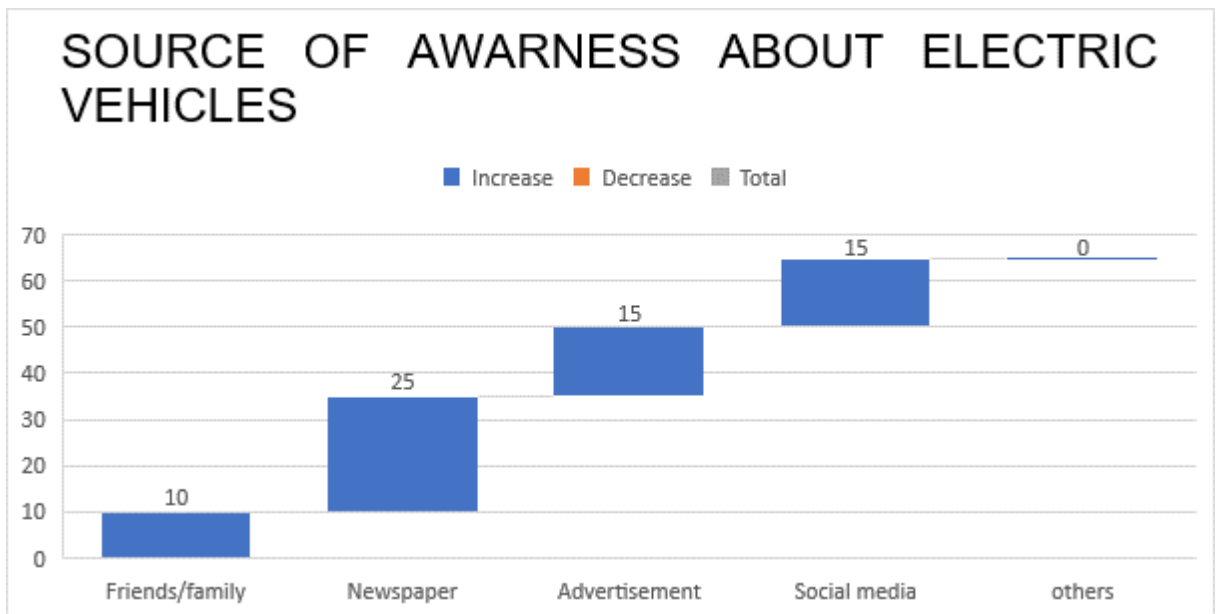| Particulars | No of respondents | % of respondents |
|---|---|---|
| Friends/family | 10 | 15% |
| Newspaper | 15 | 23% |
| Advertisement | 15 | 23% |
| Social media | 25 | 38% |
| others | 0 | 0% |
| Total | 65 | 100% |

Table 4.6



Fig 4.6

**INTERPRETATION**

The primary data collected from the 65 respondents revealed that the sources of information about electric vehicles varied among the respondents. Specifically, 15% of respondents heard about electric vehicles from friends and family, 23% from newspapers, 23% from advertisements, 38% from social media, and 0% from other sources.

**"WHICH MODEL WILL YOU PREFER THE MOST IF ELECTRIC MODEL IS AVAILABLE"**

- Bike
- Scooter
- Car

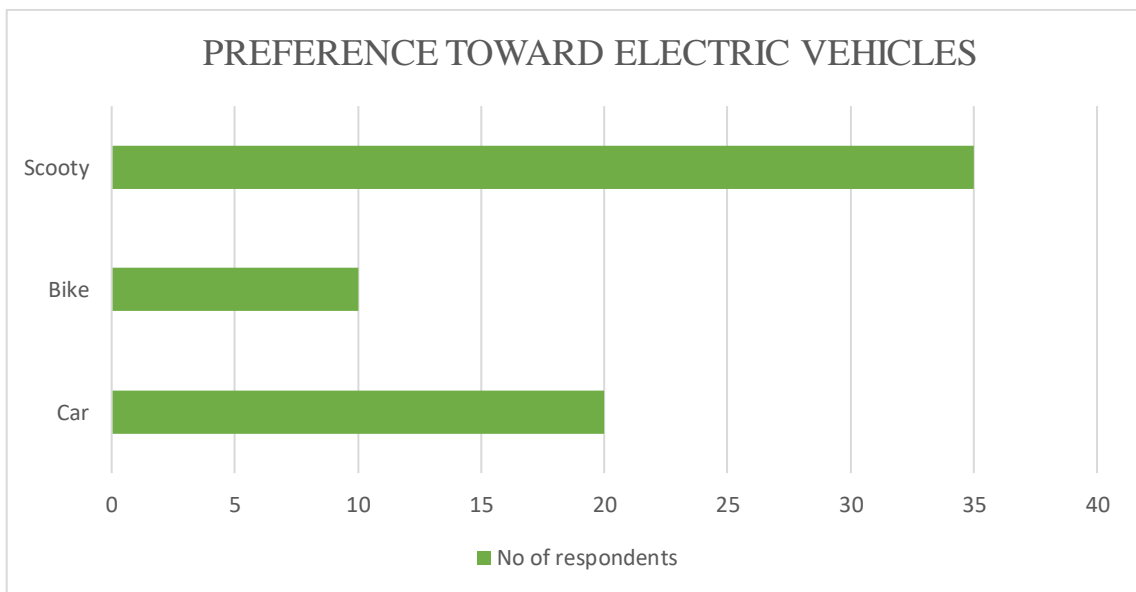| Particulars | No of respondents | % of respondents |
|:---:|:---:|:---:|
| Car | 20 | 31% |
| Bike | 10 | 15% |
| Scooty | 35 | 54% |
| Total | 65 | 100% |

Table 4.7



Fig 4.7

**INTERPRETATION**

The data collected for this study is based on responses from 65 respondents. Based on the responses from the respondents, it was found that 54% of them prefer Scooty in electric vehicles, while only 15% of respondents prefer Bike in electric vehicles.

# REGRESSION ANALYSIS

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|:-----:|:-----:|:--------:|:-----------------:|:--------------------------:|
| 1 | .574[a] | .330 | .247 | .638 |

a. Predictors: (Constant), Electric vehicles are more convenient for Short trips than long trips? Emission of greenhouses gases is comparatively low, Performance of electric vehicles are high, Number of charging stations are less, Initial cost is high, Are you aware of Government incentives , Electric vehicles are more eco-friendly than petrol and diesel

In this multiple regression analysis, the values from CETSCALE were taken as independent variables and popularity of electric vehicles in future statement is taken as the dependent variable. The regression analysis aimed to investigate the relationship between the popularity of electric vehicles in future and the consumer's preference for Electric Vehicles.

The model summary shows that the independent variables included in the model explain 33% of the variance in the dependent variable. The adjusted R-squared of 0.247 suggests that the model may not be the best fit for the data, as it indicates that a significant portion of the variance in the dependent variable is not accounted for by the independent variables.

The standard error of the estimate is 0.638, which indicates the average distance between the observed values and the predicted values of the dependent variable.

The significant independent variables in the model are: "Electric vehicles are more convenient for Short trips than long trips?", "Emission of greenhouses gases is comparatively low", "Performance of electric vehicles are high", "Number of charging stations are less", "Initial cost is high", "Are you aware of Government incentives", and "Electric vehicles are more eco-friendly than petrol and diesel".

Overall, the model suggests that these factors may be important in predicting attitudes towards the popularity of electric vehicles in the future. However, it is important to note that the model may not capture all relevant factors that influence attitudes towards electric vehicles.

# Coefficients[a]

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.339 | .731 | | 1.832 | .072 |
| | Are you aware of Government incentives | -.107 | .103 | -.118 | -1.034 | .306 |
| | Initial cost is high | .179 | .102 | .201 | 1.745 | .086 |
| | Number of charging stations are less | -.292 | .111 | -.310 | -2.637 | .011 |
| | Emission of greenhouses gases is comparatively low | .098 | .122 | .096 | .800 | .427 |
| | Performance of electric vehicles are high | .070 | .107 | .072 | .657 | .514 |
| | Electric vehicles are more eco-friendly than petrol and diesel | .284 | .107 | .318 | 2.646 | .011 |
| | Electric vehicles are more convenient for Short trips than long trips? | .078 | .116 | .075 | .676 | .502 |

a. Dependent Variable: Electric vehicles will gain more popularity in future

This is a multiple linear regression analysis with the dependent variable "Electric vehicles will gain more popularity in future" and several independent variables, each with its unstandardized and standardized coefficients, t-value and significance level (p-value).

The constant coefficient (B) has a value of 1.339 with a standard error of .731 and a t-value of 1.832, which means it is not significantly different from zero at the .05 level (p=.072).

The independent variables are:

- Are you aware of Government incentives: The unstandardized coefficient is -.107, indicating that a higher awareness of government incentives is associated with lower predicted popularity of electric vehicles. However, the standardized coefficient (Beta) is -.118, indicating that this effect is relatively small compared to the other independent variables. The t-value is -1.034, which is not statistically significant (p=.306).

- Initial cost is high: The unstandardized coefficient is .179, indicating that higher perceived initial cost is associated with higher predicted popularity of electric vehicles. The standardized coefficient is .201, indicating that this effect is relatively strong compared to the other independent variables. The t-value is 1.745, which is marginally significant at the .10 level (p=.086).

- 'Number of charging stations are less': The unstandardized coefficient is -.292, indicating that a lower number of charging stations is associated with lower predicted popularity of electric vehicles. The standardized coefficient is -.310, indicating that this effect is relatively strong compared to the other independent variables. The t-value is -2.637, which is statistically significant at the .05 level (p=.011).

- Emission of greenhouse gases is comparatively low: The unstandardized coefficient is .098, indicating that lower emissions of greenhouse gases are associated with higher predicted popularity of electric vehicles. However, the standardized coefficient is relatively small (.096) compared to the other independent variables. The t-value is .800, which is not statistically significant

(p=.427).

- Performance of electric vehicles are high: The unstandardized coefficient is .070, indicating that higher perceived performance of electric vehicles is associated with higher predicted popularity of electric vehicles. However, the standardized coefficient is relatively small (.072) compared to the other independent variables. The t-value is .657, which is not statistically significant (p=.514).

- 'Electric vehicles are more eco-friendly than petrol and diesel': The unstandardized coefficient is .284, indicating that higher perceived eco-friendliness of electric vehicles is associated with higher predicted popularity of electric vehicles. The standardized coefficient is .318, indicating that this effect is relatively strong compared to the other independent variables. The t-value is 2.646, which is statistically significant at the .05 level (p=.011).

- 'Electric vehicles are more convenient for short trips than long trips': The unstandardized coefficient is .078, indicating that higher perceived convenience of electric vehicles for short trips is associated with higher predicted popularity of electric vehicles. However, the standardized coefficient is relatively small (.075) compared to the other independent variables. The t-value is .676, which is not statistically significant (p=.502).

Overall, the results suggest that the perceived initial cost, number of charging stations, and eco-friendliness of electric vehicles are important factors in predicting their future popularity. The other factors, such as awareness of government incentives, performance of electric vehicles, and convenience for short trips, have smaller or non-significant effects. However, it is important to note that this is a correlational analysis, and causality cannot be inferred.

# LIMITATIONS OF THE STUDY

There are several limitations that should be considered when conducting research on consumer behaviour towards buying electric vehicles (EVs). Some of these limitations include:

- The study's sample size is limited to 65 respondents, who are primarily youth. Therefore, the findings and suggestions derived from the study should not be generalized to the entire population, as they may not be representative of other demographics or age groups.

- Sample bias: The sample used in the study may not be representative of the overall population of EV buyers. For example, the sample may be biased towards early adopters or those with higher levels of education or income.

- Self-report bias: Data gathered through surveys or interviews may be vulnerable to self-report bias, which occurs when respondents do not correctly represent their genuine opinions or conduct regarding EVs.

- Limited generalizability: The study's findings may be applicable solely to the specific context or population examined and may not be generalizable to other situations or groups.

- Lack of longitudinal data: The study may only capture a snapshot of consumer behaviour at a specific point in time, and may not account for changes in behaviour over time.

- Limited availability of data: There may be a limited availability of data on certain factors that influence consumer behaviour towards EVs, such as the availability of charging infrastructure or government policies and incentives.

By acknowledging these limitations, researchers can take steps to mitigate their impact on the study findings and ensure that the study provides a balanced and accurate understanding of consumer behaviour towards buying EVs.

# CHAPTER 5

# FINDING, SUGGESTION & CONCLUSION

# FINDINGS

- The majority of respondents were aware of electric vehicles. The majority of respondents are unaware of government incentives to stimulate the adoption of electric vehicles, which is why the majority of customers are not planning to purchase electric vehicles.

- The majority of respondents picked Scooter as their EV of choice if an electric vehicle was offered. 90% of those surveyed concurred that electric cars may, to some extent, cut pollution.

- The initial cost of electric vehicles is seen by many respondents to be rather expensive. The environmental friendliness of electric vehicles was praised by respondents. A large number of responders mentioned the dearth of charging facilities. This suggests that these are the variables at play when deciding whether or not to buy and drive an electric vehicle.

- Majority of respondents disagree about the high performance of electric vehicles. On the other hand respondents agreed that electric vehicles have low greenhouse gas emissions as well as they are more convenient for short trips than long trips which indicates these variables do not have a significant impact on the dependent variable and are not useful in predicting the attitude of respondents towards electric vehicles.

- Most of the respondents had a neutral opinion about attitude towards shifting to electric vehicles as

- Majority of respondents agreed that electric vehicles will gain more popularity in the future.

- The perception of electric vehicles was favourable among the respondents.

- According to the respondents, social media significantly aided in the dissemination of knowledge regarding electric vehicles.

- The majority of respondents said that they fuel their cars with petrol.



**Fig. 5.1**
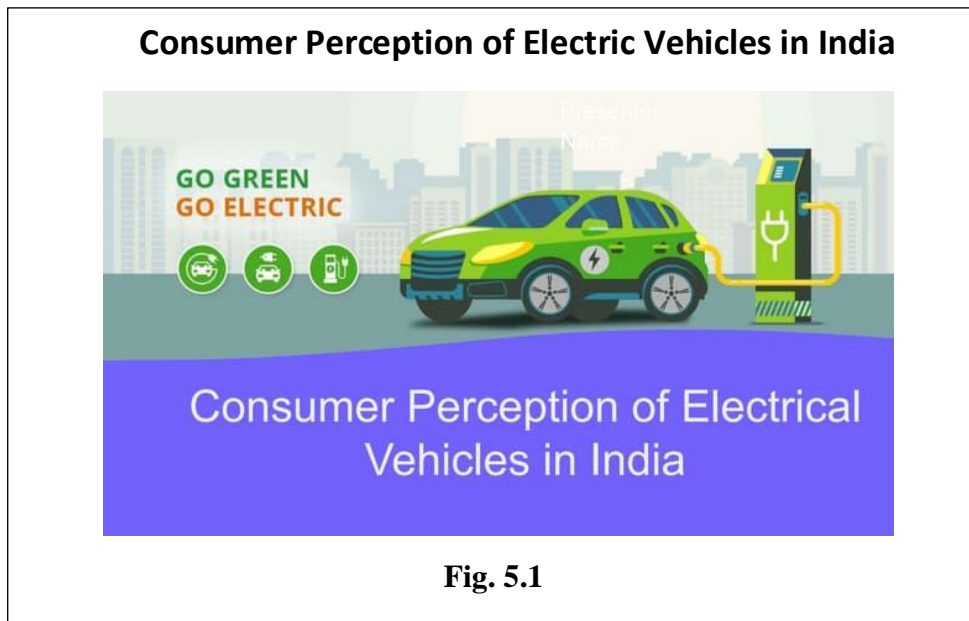
# SUGGESTIONS

- Increasing the quantity of charging stations may increase interest in purchasing electric vehicles.

- Electric vehicles need to get greater attention if we want to reduce pollution and greenhouse gas emissions.

- Businesses must focus on educating the general public about the newest electric vehicle models.

- Electric vehicles are a practical way to combat the issue of rising petrol prices, and government backing for them might benefit the country.

- Incentives and subsidies from the government may be provided to encourage the use of electric vehicles.

- Lower tax rates might encourage buyers to investigate electric cars.

- If the initial cost of electric vehicles is reduced, the market may expand.

- By promoting the use of electric vehicles, the government may be able to reduce its dependency on crude oil and its high cost.



**Fig. 5.2**
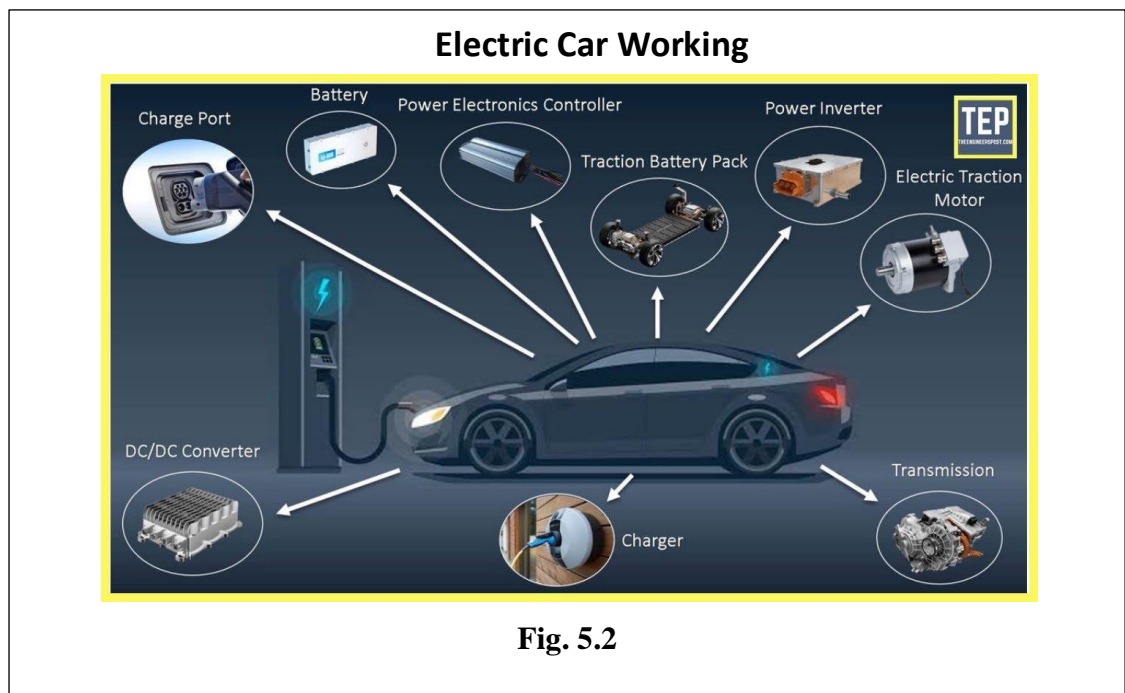
# CONCLUSION

It is critically important for the automobile sector to convert to alternative energy sources due to the depletion of fossil fuel supply and the continued rise in fuel prices in India. In order to solve this issue, the government has taken steps to reduce pollution levels, promote electric vehicles (EVs), and loosen limitations on foreign direct investment (FDI). Consequently, several fresh brands are introducing EVs in India. However, it is crucial for the government and manufacturers to collaborate on creating the necessary infrastructure and creating a setting that is conducive to EV success if EVs are to be widely adopted.

The study's findings indicate that respondents are aware of the situation of the environment internationally and are prepared to think about purchasing an electric car in the future, particularly if there is an appropriate infrastructure for charging them. However, a few issues are preventing consumers from embracing EVs. The high initial cost of EVs, the lack of charging stations, and the length of time it takes to recharge the battery are three main problems that need to be resolved.

According to the study's findings, a number of factors interact to influence how consumers see EVs. Compared to traditional gasoline-powered vehicles, which can travel farther on a single litre of petrol, EVs need to be charged more frequently since their batteries have a smaller capacity. As a result, EVs could be more popular for short-distance driving. In India, the expansion of the EV market is anticipated to be driven by two- and three-wheelers, light motor vehicles (LMVs), and city buses, among other enabling factors.

To encourage the use of long-distance vehicles like trucks and UVs, additional advancement in battery capacity and technology as well as investment in charging infrastructure are essential. Given their limited usage, EVs may not have an immediate and noticeable impact, but there are a number of enabling variables that might quicken the switch from gas-powered to electric vehicles. These include expanding the availability of EV charging stations, putting in place government incentives for EV purchases, upgrading infrastructure, extending the range of EVs, lowering their price,

educating consumers about the advantages of EVs, giving them more options for EVs, and enforcing stringent pollution standards.

Furthermore, India is expected to be one of the fastest-growing countries in terms of EV adoption, with a large consumer base that could attract both domestic and foreign players, including companies like Mahindra, to invest in EV production. This indicates the potential for rapid and significant growth in the EV market in India, provided that the necessary measures are taken to address the challenges and facilitate EV adoption.

In conclusion, the study highlights the need for energy transition in the Indian automobile sector towards EVs, but acknowledges the limitations and challenges associated with EV adoption. However, with appropriate actions such as building charging infrastructure, offering incentives, improving technology and infrastructure, and educating consumers, India has the potential to accelerate the transition towards widespread adoption of EVs, particularly in the two-wheeler and three-wheeler segments, LMVs, and city buses, while further developments are needed for long-distance vehicles.

**Should Buy Electric Car**



**Fig. 5.3**
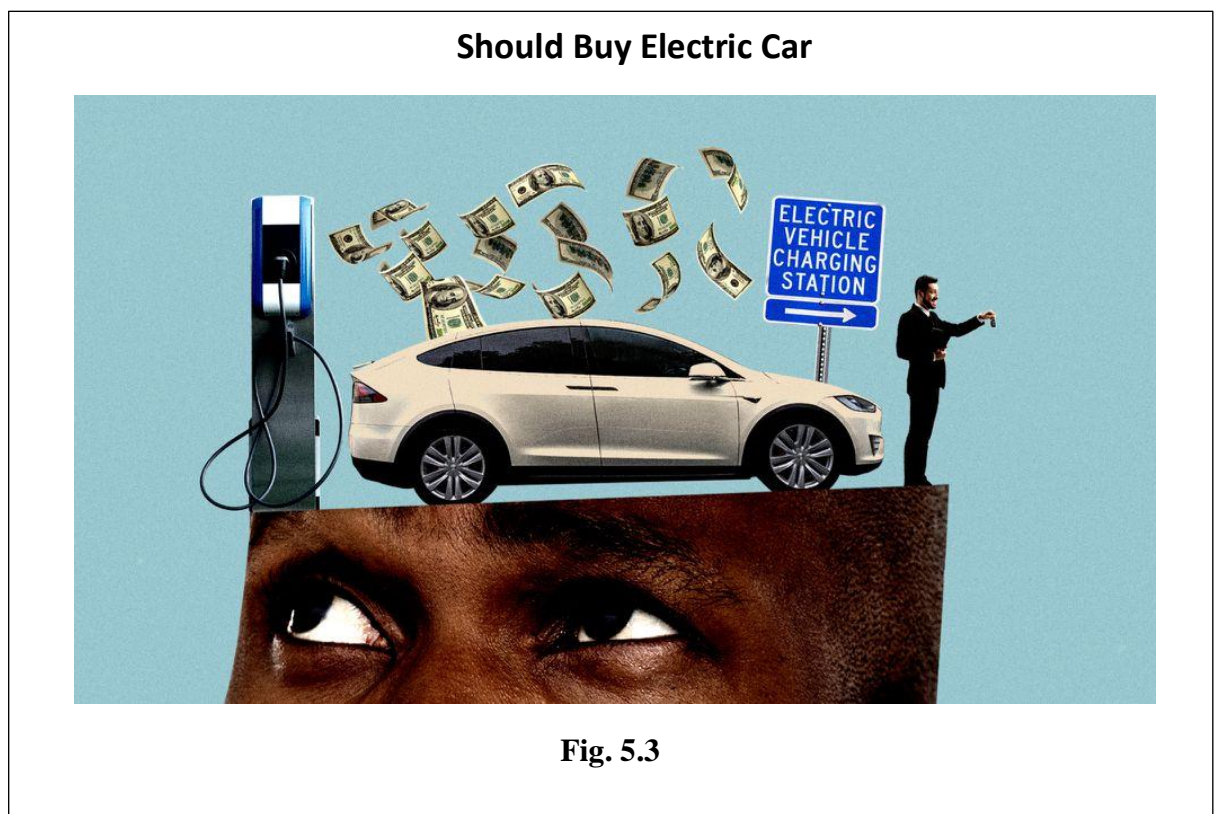
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# APPENDIX

1. Gender*

    - Male

    - Female

    - Prefer not to say

2. Age Group*

    - 18 - 21

    - 22 - 24

    - 24 & Above

3. Do you have any of the following vehicle*

    - Bike

    - Scooter

    - All of the above

4. Which fuel do you use in your vehicle*

    - Petrol

    - Diesel

    - Charging

5. Are you aware of electric vehicles*

    - Yes

    - No

    - Maybe

6. From where did you heard about electric vehicles*

- Friends and Family

- Newspaper

- Advertisement

- Social Media

- Others

7. Which model will you prefer the most if electric model is available*

- Bike

- Scooter

- Car

8. What sort of attitude do you have towards electric vehicles*

- Positive

- Negative

- Neutral

9. Are you aware of Government incentives*

- Agree

- Neutral

- Disagree

10. Initial cost is high*

- Agree

- Neutral

- Disagree

11. Number of charging stations are less*

- Agree

- Disagree

- Neutral

12. Emission of greenhouses gases is comparatively low*

- Agree

- Disagree

- Neutral

13. Performance of electric vehicles are high*

- Agree

- Disagree

- Neutral

14. Electric vehicles are more eco-friendly than petrol and diesel*

- Agree

- Disagree

- Neutral

15. Electric vehicles will gain more popularity in future*

- Agree

- Disagree

- Neutral

16. Attitude of respondents towards shifting to electric vehicles*

- Agree

- Disagree

- Neutral

17. Planning to buy electric vehicles in the future*

- Agree

- Disagree

- Neutral


18. Electric vehicles are more convenient for Short trips than long trips?*

- Agree

- Disagree

- Neutral