PROJECT REPORT (MMPP-001)

STUDY ON ADOPTION AND MARKETING STRATEGIES

FOR ELECTRIC VEHICLES IN THRISSUR DISTRICT,

KERALA

SUBMITTED IN PARTIAL FULFILLMENT OF THE

REQUIREMENT OF

MASTER OF BUSINESS ADMINISTRATION (MBA)

BY ASWATHI T S

ENROLMENT NO: 2351650974

UNDER THE SUPERVISION OF

MRS. JYOTHIS RACHEL MATHEWS

SUBMITTED TO:

School of Management Studies,

INDIRA GANDHI NATIONAL OPEN UNIVERSITY

Maidan Garhi, New Delhi – 11006

ACKNOWLEDGEMENT

I would like to take this opportunity to express my sincere gratitude to all those who contributed to the completion of this project. First and foremost, I would like to express my heartfelt gratitude to **Mrs. Jyothis Racheal Mathew**, my project guide, for her invaluable guidance, support, and encouragement throughout this journey. Her insights and expertise have been instrumental in shaping this work, and I am truly thankful for her patience and dedication in providing constructive feedback at every stage.

I am also thankful to the faculty of IGNOU and to my esteemed university for providing me with the opportunity to undertake this project as part of my MBA program, which has been an enriching learning experience.

Additionally, I extent my sincere thanks to the support system at IGNOU, with special mention to Mr. Cliffi Mendez and Mrs. Mini, whose resources, guidance's, and administrative support provided a solid foundation for my project work. The flexibility and assistance offered by IGNOU made it possible for me to undertake this research smoothly and effectively.

Finally, I express my sincere appreciation to my family and friends for their constant encouragement and support during the course of this project

Thank you all for your invaluable contributions to the completion of this project.

DECLARATION BY THE STUDENT

I **Aswathi T S**, Enrollment number **2351650974**, hereby declare that the Project Report entitled "*Study on Adoption and Marketing Strategies for Electric Vehicles (EVs) In Thrissur District, Kerala*" submitted to Indira Gandhi National Open University (IGNOU), in partial fulfillment of the program **MBA Marketing 2025**, is my **original and independent work**, carried out under the guidance of **Prof, Mrs. Jyothis Racheal Mathews, Assistant Professor of Management, Ahalia School of Management.**

I further declare that this project has **not been submitted to any other institution or university** for the award of any degree, diploma, or certificate.

All sources of information have been duly acknowledged in the report

Place: Thrissur, Kerala
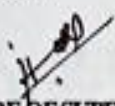**Date: 09/07/2025**

Signature of the Student:

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CERTIFICATE OF ORIGINALITY

This is to certify that the project titled " STUDY ON ADOPTION AND MARKETING STRATEGIES FOR _____

ELECTRIC VEHICLES IN THRISSUR DISTRICT, KERALA _____ " is an original work of the

Student and is being submitted in partial fulfillment for the award of the Master's Degree in Business

Administration of Indira Gandhi National Open University. This report has not been submitted earlier

either to this University or to any other University/Institution for the fulfillment of the requirement of

a course of study.

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Place : THRISSUR, KERALA

Date : 09/07/2025

PROJECT PROPOSAL (MMPP-001)

STUDY ON ADOPTION AND MARKETING STRATEGIES FOR ELECTRIC VEHICLES IN THRISSUR DISTRICT, KERALA

SUBMITTED BY

ASWATHI T S

ENROLMENT NO: 2351650974

PROGRÆM: MBA

UNDER THE SUPERVISION OF

MS. JYOTHIS RACHEL MATHEWS

SUBMITTED TO:

School of Management Studies,

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Courses he/ she is counseling for:

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Signature of Supervisor

Date:

Please do not forget to enclose the synopsis of the project and the Bio-data of the Supervisor. In case the complete
and signed Bio-Data of the Supervisor is not enclosed, the proposal will not be entrained.

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Synopsis	Supervisor
Approved ✓	Approved ✓
Not Approved	Not Approved

Comments & Suggestions of the Evaluator
(Use backside of the proforma, if the space for writing
the comments is not Sufficient)

Dr. Shus1.13

Signature of Evaluator

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**Counter Signature of the
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Skilled, talented and qualified faculty with more than 13yr years of experience in teaching post graduate students, administration and management of college activities. Looking for a challenging position in a dynamic environment to utilize skills and proficiency in the mentioned field.

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- Creative Lesson Planning
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KEY RESPONSIBILITIES HANDLED:

- Acted Chief superintendent for University exam MBA Calicut university
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- ➢ H R Executive Head Way Consultants, Chennai(2004- 2005)
- ➢ Lecturer :Assumption Community College Changanaserry (2005)
- ➢ Lecturer : Mar Athanasius College for Advanced Studies , Thiruvalla (2005-2007)
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- ➢ Currently working as Assistant Professor in Ahalia School of Management, Palakkad since 2023.

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- ➢ Business communication, organizational behavior, Soft skill development, Marketing Management, Human Resource Management, Managing Self And Others, Management Of Training and Development, New Enterprise Management, Consumer Behavior, Advertisement and Sales promotion. Sales management, Retail management

EDUCATION& CREDENTIALS

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- ➢ MBA (Marketing & HR dual specialization) -Jaya Engineering College Anna University, Chennai.(2004)

TECHNICAL SKILL

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- Internet Savvy.
- **SAP/ERP** : One twenty hours training from NORTEC

PUBLICATION & PRESENTATION

- ➢ Presented paper on Role of Emotional Intelligence in Entrepreneurial Success –Study amongst the Sociopreneurs in Kerala.
- ➢ Authored article titled Attitude Virus At Work Place.-BAM college journal
- ➢ Authored an article titled Emotional Intelligence: The New Paradigm in Business-
- ➢ Presented paper on "Women Entrepreneurship"- As a part of Entrepreneurship Development programs conducted in B.A.M College, Thurithicadu, Kerala

> Submitted a paper on recycling tyres for construction of roads. Proposal – Madras Management Association   business plan contest (2003)

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- Attended one week online **international Research Program** . 7thMarch -13th March 2022.

- Attended FDP on **Art of mentoring** 22nd February 2022.

- Attended 5 days **International Online FDP on Insights of writing Research Paper** . November18th-November 22nd ,2021

- Attended webinar on **Art of publishing Research Paper** –TNJFU Fisheries Business School, chennai .20th November 2021

- Attended **National Level Online Workshop On nuances Of Data Collection Methods For Social Sciences Research.** on 13th November ,2021

- Attended **National Workshop on Data Analysis using SPSS** organised by the   Department of Management (BBA), Kristu Jayanti College (autonomous), Bengaluru from October 25, 2021, to October 31, 2021.

- Participated in a **workshop Pndemic and Beyond - The Future Classroom**-organised by IBS ,Kochi (25th September,2021)

- Participated in 9th **Management Development program on Gamification for learning & development** – organized by school of management studies CUSAT (6th August -9th August 2020)

- Participated in the Faculty Development Programme on *"Mentoring Pedagogy and Teaching for Higher Education"* Organised by the Department of Commerce (Accounting & Finance) Prince Shri Venkateshwara Arts And Science College on 21.8.2021

- Attended FDP on **Case Analysis & Discussion(Harvard Cases)**-organised by Thrissur Management Association and Case Research Society of India (24 th august -28 th August 2021)

- Attended in One Week **International Faculty Development Programme "Effective Teaching for the Next Generation"** from 27th July to 2nd August, 2020 jointly

organised by Department of Management Studies and Internal Quality Assurance Cell (IQAC) of Periyar Maniammai Institute of Science & Technology (Deemed to be University), Tamil Nadu,

- Participated in **International Webinar on Marketing Challenges and employee engagement post covid 19**- organized by Institute of Management in Kerala ,Kerala University (30th July ,2020)
- Participated in the **Webinar 'Unleash the Power of Mind for Unlimited Success'** by Dr. Venkat Sivagnanam, Transformation and Success Coach - Human Potential Expert, organized by School of Business and Management, CHRIST (Deemed to be University) on 24 July 2020.
- Participated in the **International Webinar** titled **"Sustainable Business Opportunities and Resilience**: A Post Pandemic Era" on **28th July,2020**
- Participated in the one week online FDP on *"Being a Super Teacher"*-organized by Bannari Amman Institute Of Technology School Of Management Studies (July 6 to July 12, 2020)
- **Participated in Online FDP on "Effective Online Teaching Strategies"** held on 6th June, 2020 hosted by Marian International Institute of Management, Kuttikkanam, Kerala.
- Participated in the **webinar** on **Marketing in Feedback Economy** -organised by the Department of Management, Christ Nagar College, Maranalloor, Trivandrum on 5 July 2020
- Completed the Online Awareness Test on **"The Impact of Covid-19 on Indian Economy"** conducted by Department of Economics in association with Internal Quality Assurance Cell (IQAC) of NSS College, Nemmara, Palakkad, Kerala.

- Attended National seminar on *Emerging Trends In Management* ,organized by ELIMS
- Attended FDP *"Project Preparation Techniques"* at Calicut University Centre
- Attended FDP on *Blooms Taxonomy* –organized by ELIMS
- Attended FDP on *Current and emerging trends in teaching and learning* organized by MACFAST

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PERSONAL INFORMATION & INTERESTS

Date of birth: 23rd October, 1981••• Gender: Female ••• Marital status: Married .Interests include reading, music, travel, dance, drama, and charity work.

REFERENCES

References are available upon request

Jyothis Rachel Mathews

ELIJAH IMS/SER CER/2022-2023/SEP/001   10/09/2023

SERVICE CERTIFICATE

This is to certify that **JYOTHIS RACHEL MATHEWS, ASSOCIATE PROFESSOR** has served in this institution from 05/11/2007 to 10/09/2023.

Her Conduct and character have been Good.

Prof. (Dr.) LINDA MARY SIMON
PRINCIPAL
ELIJAH INSTITUTE OF MANAGEMENT STUDIES
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Anna University

The Syndicate of the Anna University hereby makes known that **JYOTHS RACHEL MATHEWS** has been admitted to the DEGREE OF **MASTER OF BUSINESS ADMINISTRATION** having satisfactorily completed the prescribed programme of study and having been certified by duly appointed examiners to be qualified to receive the same and having been placed by them in the First Class at the Examination held in **June 2004.**

...nder the Seal of the University

Department of Commerce
Irinjalakuda
Christ College (Autonomous)

Attested

K.J. Joseph

Chennai 600 025
India
December 2004

Registrar

Vice-Chancellor

CONTENTS

INTRODUCTION

The global automotive industry is undergoing a significant transformation, driven by the pressing need to reduce carbon emissions and mitigate climate change. Electric Vehicles (EVs) have emerged as a viable alternative to traditional internal combustion engine vehicles, offering a cleaner, more sustainable, and environmentally friendly transportation solution. India has emerged as a pivotal player in the global automobile landscape, with its electric vehicle (EV) sector gaining significant traction. The confluence of factors such as favorable policy frameworks, escalating environmental consciousness, decreasing costs, heightened market awareness, and proactive government initiatives has catalyzed this growth. However, the predominant reliance on fossil fuels in Thrissur district's transportation sector perpetuates environmental degradation and health risks, underscoring the imperative for alternative energy solutions. The Government of India has launched initiatives like the National Electric Mobility Mission Plan (NEMMP) and FAME- || (Faster Adoption and Manufacturing of Electric Vehicles) scheme to promote EV adoption. Kerala State, known for its eco-friendly initiatives, has also announced plans to promote EVs.

The nations excessive dependence on fossil fuels not only comprises its balance of payments but also renders it vulnerable to geopolitical uncertainties in oil-producing regions, potentially destabilizing India's economic security. Considering these challenges, this project proposes to investigate the viability of promoting electric vehicles in Thrissur district, exploring strategies to mitigate environmental pollution, ensure energy security, and contribute to the nation's sustainable development goals. Recognizing the primary hurdles to Electric Vehicles (EVs) adoption in Kerala necessitates a comprehensive understanding of pivotal aspects. Research focused on these factors can inform strategies to overcome obstacles, ultimately expanding EV adoption.

This report provides an exhaustive review of recently implemented EV promotion policies, empowering potential adopters with in-depth knowledge. Specifically, this study examines the district of Thrissur, Kerala, to gauge public perceptions, aspirations, and state government initiatives promoting EV usage. The importance of this study lies in its

potential to contribute to the development of a sustainable transportation ecosystem in Thrissur District. By understanding consumer preferences, concerns, and motivations, EV manufacturers and policymakers can design targeted interventions to accelerate EV adoption. Moreover, this research will provide valuable insights into the effectiveness of various marketing strategies, enabling stakeholders to optimize their efforts and resources.

This research will employ a mixed-methods approach, combining both qualitative and quantitative data collection and analysis methods. The study will survey a representative sample of consumers in Thrissur District to gather data on their perceptions, attitudes, and preferences regarding EVs. Additional data will be collected through discussions and secondary research. The findings of this study will contribute to existing body of knowledge on EV marketing, while providing actionable recommendations for stakeholders to promote sustainable transportation solutions in Thrissur District.

PROBLEM STATEMENT

The adoption of electric vehicles (EVs) in India, particularly in Thrissur District, Kerala, remains significantly low despite the global push for sustainable transportation solutions to mitigate climate change. This slow uptake is attributed to several challenges, including ineffective marketing strategies that fail to address key consumer concerns, limited understanding of local perceptions and attitudes toward EVs, and a lack of awareness about government incentives and subsidies. Furthermore, the insufficient use of digital marketing, inadequate promotional events, and weak targeting and segmentation strategies hinder efforts to engage potential buyers effectively. The district's limited charging infrastructure and subpar after-sales service contribute to range anxiety and doubts about EV reliability, while psychological resistance to change and lifestyle barriers add to the reluctance to shift from traditional fossil fuel vehicles to choice on EVs. Additionally, there is insufficient emphasis on the environmental benefits of EVs and a lack of sustainable waste management practices for EV batteries. Addressing these multifaceted barriers is essential for fostering greater acceptance of EVs in Thrissur, ultimately supporting broader environmental goals and sustainable mobility in India. The comprehensive research statement undertaken for

the study is:

What are the key factors hindering the adoption of electric vehicles (EVs) in Thrissur District, Kerala, including consumer perceptions, attitudes, and awareness of government incentives, and how do current marketing strategies, impact the willingness of consumers to transition from traditional vehicles to EVs?

RATIONALE OF THE STUDY

The automobile and transportation sector are a significant contributor to air pollution, contamination of air quality, noise pollution as well as greenhouse gas emissions, accounting for approximately 23% of global emissions. India, with its rapidly growing economy, is experiencing an increase in vehicle ownership, leading to rising emissions. To manage this with better methodologies, the Indian government has set ambitious targets to promote electric vehicles (EVs) aiming for 30% of new vehicle sales to be electric by 2030. To support the development of sustainable transportation policies, given the Indian government's push for electric mobility and the lack of regional-specific research, this research investigates consumer perceptions and adoption barriers of electric vehicles in Thrissur district, providing valuable insights for policymakers and industry stakeholders.

OBJECTIVES OF THE STUDY

- To analyze consumer perceptions and attitudes towards electric vehicles (EVs) in Thrissur District, Kerala, and understand how these factors impact adoption.
- To identify key adoption barriers that are influencing marketing of electric vehicles (EVs).
- To assess the level of consumer awareness regarding government incentives and subsidies for EVs and evaluate their influence on purchasing decisions.
- To evaluate the effectiveness of current marketing strategies in addressing consumer concerns and promoting EV adoption in the region.

HYPOTHESIS OF THE STUDY

1. H0: There are no significant differences in consumer perceptions and attitudes towards electric vehicles (EVs) based on demographic factors such as age, income, education level, geographic location, and gender.

2. H0: Consumer awareness of government incentives and subsidies does not significantly influence purchasing decisions for electric vehicles (EVs) in Thrissur District.

3. H0: Adoption barriers do not have a significant influence on the marketing of electric vehicles (EVs) in Thrissur District.

RESEARCH METHODOLOGY

Research Design

The study adopts a mixed-methods approach, incorporating descriptive, qualitative, and quantitative research designs. This combination enables a comprehensive understanding of consumer perceptions and adoption barriers for electric vehicles (EVs) in Thrissur District, Kerala. Descriptive research facilitates a detailed examination of the phenomena, while qualitative research provides in-depth insights into social behaviours and attitudes. Quantitative research, through statistical analysis, allows for objective measurement and analysis of data.

Sources of Data

The research utilizes both primary and secondary sources of data:

- **Primary Data**: Collected directly from residents of Thrissur District through structured questionnaires.
- **Secondary Data**: Relevant literature and previous studies on EV adoption, consumer behaviour, and marketing strategies will be reviewed to provide contextual understanding and support findings.

Population

The target population for this study comprises residents of Thrissur District, Kerala, with a focus on potential consumers of electric vehicles. This population includes individuals of various demographic backgrounds, which will help in understanding diverse perceptions and attitudes toward EVs.

Sample Size

The study will focus on a sample size of 100 to 150 respondents. This sample size is deemed sufficient to gather varied insights while allowing for manageable data analysis.

Sampling Technique

A purposive sampling method will be employed to collect primary data. This technique involves selecting individuals who are likely to have relevant information about EVs and their adoption. It ensures that the sample includes respondents with varied demographics, enhancing the richness of the data collected.

Data Collection Methods

Data collection will be conducted using the following methods:

Questionnaire: A structured questionnaire will be designed, encompassing both open-ended and closed-ended questions. The questionnaires will be distributed through Google Forms, enabling easy access and completion by respondents via online. Along with this respondent will be encouraged to complete the survey directly, ensuring clarity in instructions and fostering higher response rates.

Data Analysis

Data collected from the questionnaire responses will be analysed using Microsoft Excel analytical tools. The analysis will involve:

- Descriptive statistics to summarize the demographic characteristics of respondents.
- Quantitative analysis to assess correlations between consumer perceptions, awareness of incentives, and adoption barriers.
- Qualitative analysis of open-ended responses to identify common themes and insights regarding attitudes toward EVs

LIMITATIONS TO THE PROJECT

1) The limited sample size of 100 to150 respondents may not accurately reflect the diverse population of Thrissur District, potentially skewing the results and insights regarding consumer perceptions of electric vehicles (EVs)

2) Difficulties in obtaining proprietary data from EV manufacturers or distributors, coupled with the potential biases introduced by questionnaire design and wording, may affect the validity and reliability of the collected data. Additionally, capturing consumer perceptions at a single point in time may not account for changes in attitudes or behaviors over the longer term.

3) Rapid advancements in EV technology, along with potential changes in government policies and regulations regarding incentives and subsidies, may render the research findings outdated or less relevant over time.

4) The findings of this research on EV adoption and barriers on effective marketing are contingent upon the emergence of superior sustainable alternatives, such as Hydrogen fuel cell vehicles which may outcompete EVs on sustainable options and consumer preferences.

LITERATURE REVIEW

The current landscape of electric vehicle (EV) adoption in India, particularly in Kerala, is shaped by various factors including market barriers, consumer perceptions, government initiatives, and evolving marketing strategies. A synthesis of recent research papers reveals critical insights and perspectives that contribute to understanding these dynamics.

Market Potential and Barriers

Hema and Venkatarangan (2021) emphasize that India represents the largest untapped EV market globally. However, the growth potential of the EV sector is hindered by significant market barriers, notably the need for sophisticated charging infrastructure. The "Make in India" initiative is highlighted as a key driver encouraging local production of essential components, particularly lithium-ion batteries. Moreover, a new business model promoting high utilization of charging and swapping solutions is essential to accelerate EV adoption.

Khan (2023) addresses the ambitious target set by the Indian government to achieve 30% EV penetration by 2030. Despite this goal, the EV market remains in a nascent stage, facing marketing challenges such as high initial costs, insufficient charging infrastructure, limited driving range, low consumer awareness, and a strong preference for traditional petrol and diesel vehicles.

Consumer Awareness and Adoption

Dobhal and Ruchitha (2024) investigate the perceptions of youth toward EVs, highlighting that women show a significant inclination toward electric two-wheelers. The study underscores the critical role of marketing strategies in shaping consumer purchase decisions for two-wheelers.

Sreeja and Vennila (2024) further contribute to this understanding by examining consumer preferences and satisfaction regarding electric two-wheelers in Calicut City, Kerala. Their findings indicate that factors such as price, perceived value for money, performance satisfaction, and charging infrastructure availability significantly influence consumer behaviour. A strong positive relationship between purchase intention and satisfaction with performance was noted, suggesting that satisfied consumers are more likely to intend to purchase electric two-wheelers.

Future Prospects and Policy Framework

Shrivastava (2021) outlines the potential benefits of transitioning from internal combustion engine vehicles to EVs in India, projecting a reduction in oil-import

Government Policies and Initiatives

The Kerala State Electric Vehicle Policy, as detailed by the Kerala State Electricity Board (KSEB) in 2023, reflects the state's proactive approach towards promoting EV adoption. Kerala was one of the first states to introduce a comprehensive EV policy in March 2019, aiming to create light house regions in urban areas to lead the transition to electric mobility. This policy emphasizes sustainable and clean transportation solutions and targets specific urban agglomerations to become models for EV adoption.

According to Evreporter (2023), the Kerala Electric Vehicle Policy set an ambitious goal of achieving 1 million EVs by 2022 and aims to convert the entire fleet of the State Road Transport Corporation to electric vehicles by 2025. Plans include establishing 20 public charging stations (PCS), bulk charging stations (BCS), and 150 swapping stations for two- and three-wheelers in major cities like Thiruvananthapuram, Ernakulam, and Kozhikode. This infrastructure development is critical for alleviating range anxiety and enhancing the feasibility of owning electric vehicles.

Marketing Challenges and Consumer Preferences

The research paper "Marketing Problems and Prospects with Reference to Adoption of Electric Vehicles in India" by Khan (2023) emphasizes that despite governmental initiatives, significant marketing challenges persist. High initial costs, lack of awareness, and preference for conventional vehicles continue to deter potential buyers. The study advocates for targeted marketing strategies that address these barriers, highlighting the importance of consumer education regarding the long-term savings and environmental benefits of EVs.

Another significant aspect discussed in the literature is the role of digital marketing in

influencing consumer behaviour. As highlighted by various studies, including that of Dobhal and Ruchitha (2024), effective use of digital marketing strategies can enhance consumer engagement and awareness. This is particularly relevant among younger demographics, who are increasingly turning to online platforms for information and purchasing decisions.

Technological Advancements and Market Dynamics

As per the "Future of Electric Vehicles in Indian Markets" report by Shrivastava (2021), advancements in battery technology and charging infrastructure are pivotal for the growth of the EV market in India. The transition to EVs is contingent on continuous innovations in technology, which can lead to reduced costs and improved vehicle performance. The report suggests that Indian manufacturers need to focus on R&D to keep pace with global advancements and consumer expectations.

Environmental and Economic Implications

Several studies underscore the environmental benefits associated with the adoption of EVs, particularly in reducing greenhouse gas emissions and dependence on fossil fuels. The transition to electric mobility is seen as a critical strategy for India to meet its climate goals while simultaneously reducing its oil import bill. This economic incentive is particularly Sreeja and Vennila's (2024) research reinforces the importance of understanding consumer satisfaction in driving EV adoption. Their findings indicate that performance satisfaction, perceived value for money, and the availability of charging infrastructure are significant determinants of consumer behaviour towards electric two-wheelers. Satisfied consumers are more likely to advocate for EVs, thereby influencing peers and enhancing market penetration.

BIBILOGRAPHY

1) Hema, R. & Venkatarangan, M.J. (2022). Adoption of EV; Landscape of EV and opportunities for India.

2) Thampi R, R. & Bhat, K.S. (2023). Literature review on dynamic marketing strategy of electric vehicles in India, special reference to Kerala State.

3) Sreeja, O.K. & Shree, V. (2024). A study on consumer preference and satisfaction of usage towards electric two-wheelers – A study with special reference to Calicut City, Kerala. Research Scholar, Department of Commerce, Vels University, Chennai & Professor and Head of the Department of Commerce, Vels University, Chennai.

4) Shrivastava, A. (2021). Future of Electric Vehicles in Indian Markets. Bhopal School of Social Sciences.

5) Khan, I.A. (2024). A study of marketing problems and prospects with reference to adoption of electric vehicles in India. Abeda Inamdar Senior College.

6) Dobhal, N. & Ruchitha, V. (2024). Consumer perception of youth towards EV and examination of digital marketing strategies of EV companies. PGDM Students, Indus Business Academy, Bangalore.

7) KSEB (2023). Kerala State EV Policy – 2023 draft.

8) EVreporter (2023). Kerala Electric Vehicle Policy.

STUDY ON ADOPTION AND MARKETING STRATEGIES FOR ELECTRIC VEHICLES IN THRISSUR DISTRICT, KERALA

ABSTRACT

The study titles **"Study on adoption and marketing strategies for electric vehicles in Thrissur District, Kerala"** aims to assess the potential for electric vehicle (EV) adoption in the region. The research focuses on understanding consumer attitudes, identifying obstacles to adoption, and formulating strategies to promote EVs effectively in Thrissur.

A mixed-approach was employed, combining both qualitative and quantitative analyses. Primary research was conducted through a structured Google survey, gathering data on consumer perceptions, preferences, and concerns related to electric vehicles. The qualitative data provides insights into the factors affecting EV adoption, such as pricing, infrastructure, and government incentives. Qualitative feedback further explores the emotional and behavioral aspects that influence consumer decisions, including environmental consciousness and trust in emerging technology.

In addition, secondary research involved a thorough review of existing literature, market trends, and case studies from regions with successful EV adoption. This comparative analysis helped identify best practices and conceptualize the findings in the local market of Thrissur.

The analysis reveals key adoption barriers, such as limited charging infrastructure, high initial costs, and insufficient awareness, while also highlighting opportunities for growth through targeted marketing strategies and policy interventions. Based on these findings, the study provides actionable recommendations for stakeholders to enhance the marketability of electric vehicles in Thrissur, ultimately contributing to a more sustainable and eco-friendly transportation system.

CONTENTS

CHAPTER 1

INTRODUCTION

INTRODUCTION

As the world grapples with the escalating environmental crisis and seeks solutions to mitigate the adverse effects of climate change, transportation has emerged as a pivotal sector in the transition toward sustainability. The reliance on traditional fuel-powered vehicles has significantly contributed to the depletion of natural resources and the increase in harmful emissions, central drivers of global warming and deteriorating air quality. In response, electric vehicles (EVs) have surfaced as a promising alternative, offering a cleaner and more sustainable mode of transportation. With growing demand for cleaner air and greener technologies, EVs are poised to play a transformative role in addressing the environmental challenges faced by both developed and developing nations.

In India, the adoption of EVs has gained momentum, with the government implementing various measures such as financial incentives, subsidies, and infrastructural support to facilitate the growth of the electric vehicle sector. However, challenges persist, including high upfront costs, limited charging infrastructure, and a lack of consumer awareness, which hinder widespread adoption.

Kerala, particularly the city of Thrissur, has emerged as a notable example of electric vehicle (EV) adoption in India. The state's forward-thinking policies, financial incentives, and investments in infrastructure have significantly contributed to the rising number of EV registrations. In 2023, Thrissur registered 5,859 electric vehicles, making it one of the leading districts in the state. This figure places Thrissur among the top contributors to Kerala's overall EV adoption, which saw 75,650 EVs registered that year. Further emphasizing this trend, in 2024, Thrissur ranked third in the state for electric car sales, with 2,577 units sold by July 11. This indicates a growing preference for electric mobility among the district's residents.

Thrissur, known for its culturally rich and discerning populace, stands out for its deep-rooted passion for automobiles. The district is home to a community of vehicle connoisseurs

and aficionados many of whom take pride in collecting vintage, classic, and high-performance cars. This unique automotive culture presents both a fertile ground and an intriguing backdrop for studying the evolving marketing and adoption strategies of EVs in the region.

As of March 2025, Kerala registered 230,027 EVs, marking a substantial rise from previous years. This surge reflects a growing consumer interest in sustainable transportation options and highlights the potential for EVs to contribute to environmental conservation efforts.

Despite the positive trends, the adoption of EVs in Thrissur faces several challenges. The city's charging infrastructure, while improving, remains insufficient to meet the growing demand. Additionally, the higher initial cost of EVs compared to traditional vehicles continues to be a barrier for many potential buyers. Furthermore, there is a need for enhanced consumer education to address misconceptions and provide accurate information about the benefits and maintenance of EVs. Addressing these challenges requires a concerted effort from the government, industry stakeholders, and consumers to create an ecosystem conducive to the widespread adoption of electric vehicles.

In Thrissur, the adoption of EVs has been influenced by various factors, including government policies, infrastructure development, and consumer awareness. The Kerala government's initiatives, such as the implementation of the Electric Vehicle Policy, have played a crucial role in promoting EV adoption. These policies have provided incentives like subsidies, tax exemptions, and the establishment of charging stations, thereby encouraging consumers to make the switch to electric mobility. However, challenges such as the high cost of EVs, limited charging infrastructure, and range anxiety continue to impede widespread adoption.

The marketing strategies employed by EV manufacturers and dealerships in Thrissur have also contributed to the adoption process. Effective marketing campaigns that highlight the

environmental benefits, cost savings, and technological advancements of EVs have helped in creating awareness among consumers. Additionally, test drives, promotional offers, and collaborations with local businesses have further facilitated the acceptance of EVs in the region.

Despite these efforts, the pace of EV adoption in Thrissur has been slower than anticipated. Factors such as the initial investment required for EVs, concerns about the availability of charging stations, and the lack of a robust after-sales service network have deterred potential buyers. Moreover, the absence of a comprehensive policy framework at the local level has led to inconsistencies in the implementation of EV-related initiatives.

To accelerate the adoption of EVs in Thrissur, it is imperative to address these challenges through a multi-faceted approach. This includes enhancing the charging infrastructure, providing financial incentives, conducting awareness campaigns, and developing a supportive policy environment. By doing so, Thrissur can position itself as a model city for sustainable transportation in Kerala and contribute significantly to the state's goal of reducing carbon emissions and promoting green mobility.

The Case of Kerala: A Promising Landscape for EV Adoption

Among India's many states, Kerala stands out as one of the most forward-thinking in terms of sustainability and technological adoption. The state has long been a pioneer in social development, with high literacy rates, progressive health policies, and a generally high standard of living. In recent years, Kerala has turned its focus toward sustainable development, with initiatives in waste management, renewable energy, and eco-friendly transportation. Electric vehicles, as part of the broader push for green technologies, have garnered growing attention in Kerala, particularly in urban areas where air pollution and traffic congestion are becoming significant challenges. Among the cities and districts of Kerala, Thrissur is emerging as an interesting location for studying

Thrissur's demographic profile makes it an ideal candidate for studying how electric vehicles can penetrate a market that combines urban, suburban, and rural characteristics. The district is home to a population that spans a wide range of age groups, including younger, tech-savvy individuals as well as older generations who have been accustomed to conventional vehicles for decades. These generational differences, along with varying socio-economic conditions, provide a unique backdrop for examining the factors that could drive or hinder EV adoption.

As the world becomes more conscious of the environmental and economic impacts of traditional transportation systems, Kerala, and its different 14 districts are at a crossroads on this matter of capacity. Among those 14 districts, for the analysis here Thrissur district of Kerala is planned and particularly chosen for assessing the hindrances and barriers on EV adoption, which can provide generic idea on the issue of this sustainable transportation obstacles of Kerala as well. The state has been proactive in implementing policies to promote electric vehicles, such as tax rebates and incentives for EV manufacturers, the actual adoption rate in cities like Thrissur remains low due to a combination of factors. These include limited charging infrastructure, high upfront costs of EVs, lack of consumer knowledge, and concerns about the reliability and performance of electric vehicles. However, these barriers are not insurmountable. Technological advancements, increased government support, and a more informed consumer base can pave the way for greater adoption of EVs in Kerala.

Understanding the Regional Landscape: Thrissur's Unique Potential being Thrissur, located in central Kerala, which is popularly known as 'the cultural capital of Kerala' is an economically and culturally diverse district that has shown potential for embracing new technologies. Thrissur district is renowned for its thriving entrepreneurial ecosystem, home to some of the most successful and well-established businesses. The region has produced influential entrepreneurs who have built flourishing enterprises (e.g. VGuard, Kalyan, Lulu, Elite and more) across various industries. The district's mix of rural and urban areas

provides a unique opportunity to explore the different challenges faced by consumers in adopting electric vehicles.

As Kerala's third-largest city, Thrissur serves as a hub for commerce, education, and cultural exchange. Additionally, Thrissur boasts a vibrant community of automobile enthusiasts, including passionate collectors of both vintage and high-end luxury cars, bikes, jeeps and more. These automobile connoisseurs are not just collectors but also well-informed critics, deeply knowledgeable about automotive technology, design, and performance. With a keen eye for quality and innovation, they set high standards in the automobile space, making them some of the most discerning and zealous automotive enthusiasts in the district and the state. The increasing demand for sustainable solutions, driven by both government policies and rising public awareness, has created a fertile ground for electric vehicle adoption in the district.

The population of Thrissur is diverse, with a substantial proportion of younger individuals who are more open to new technologies and sustainability-driven solutions. This younger demographic, especially millennials and Gen Z, tends to prioritize environmental considerations and is more likely to adopt green technologies like electric vehicles. These generations are well-versed in digital technology and are likely to be more responsive to targeted marketing campaigns that highlight the environmental benefits and cost savings of EVs. However, while younger individuals are enthusiastic about adopting electric vehicles, older generations may be more reluctant, as they are more familiar with traditional vehicles and may harbor doubts about the reliability and performance of EVs.

The varied attitudes toward EV adoption across different age groups, economic backgrounds, and lifestyles in Thrissur offer valuable insights into how marketing strategies can be tailored to address specific concerns and preferences. For example, younger consumers may place greater emphasis on the environmental impact of their transportation choices, while older consumers might be more concerned about vehicle performance, cost,

and the availability of support infrastructure. Understanding these different perspectives is crucial for developing marketing and adoption strategies that can resonate with a broad spectrum of potential consumers.

The Key Barriers to EV Adoption in Thrissur

Despite the growing interest in electric vehicles in Kerala, several key barriers continue to hinder their widespread adoption in Thrissur. One of the most significant obstacles is the high initial cost of electric vehicles. Although EVs offer long-term savings in fuel and maintenance, the upfront cost of purchasing an electric vehicle remains a significant deterrent for many potential buyers. This is especially true in a market like Thrissur, where many consumers prioritize affordability in their purchasing decisions. Financial incentives, such as subsidies or tax rebates for electric vehicles, can help reduce the price gap and make EVs more attractive to a larger section of the population.

Another significant barrier is the lack of adequate charging infrastructure. Electric vehicle owners in Thrissur often face the challenge of finding convenient charging stations, especially in less urbanized areas. Range anxiety—the fear of running out of battery power before reaching a charging station—remains a major concern for potential EV buyers. Without sufficient charging infrastructure, particularly in residential areas and key commercial zones, the convenience of owning and using an EV is compromised. Expanding the network of public and private charging stations is essential to alleviating this concern and boosting consumer confidence in electric vehicles.

In addition to these infrastructural and economic challenges, there is also a lack of awareness and understanding about electric vehicles among consumers in Thrissur. Many potential buyers are not fully informed about the benefits of EVs, such as their lower operating costs, reduced maintenance requirements, and positive environmental impact. There is a need for comprehensive education and awareness campaigns to highlight these advantages and dispel any misconceptions about the limitations of electric vehicles.

Consumer education can also help address concerns about battery life, performance, and the long-term reliability of EVs, which remain significant hurdles in convincing traditional vehicle owners to make the switch to electric mobility.

The Role of Government and Policy Support in EV Adoption

The Indian government has introduced various policies to encourage the adoption of electric vehicles, including the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme, which provides financial incentives for EV buyers and manufacturers. At the state level, Kerala has also implemented a comprehensive electric vehicle policy aimed at accelerating the adoption of EVs. These policies focus on providing incentives for both consumers and manufacturers, improving charging infrastructure, and setting ambitious goals for the integration of electric vehicles into the state's transportation system.

However, while these initiatives are crucial, they need to be complemented by effective implementation at the regional level. In Thrissur, local authorities must work closely with policymakers and industry stakeholders to ensure that infrastructure, incentives, and education programs are in place to support EV adoption. Localized efforts to expand charging stations, offer financial incentives, and increase public awareness of the environmental and economic benefits of EVs are key to accelerating the transition to electric mobility in the region.

A Balanced Approach to Consumer Engagement and Marketing

The ultimate success of electric vehicle adoption in Thrissur will depend on how effectively these barriers are addressed through targeted marketing strategies. Understanding the diverse needs of consumers, both young and old, will be essential in creating compelling messaging that resonates with the target audience. A one-size-fits-all approach to marketing electric vehicles is unlikely to be effective in a region as diverse as Thrissur. Instead,

marketing efforts must be tailored to address the specific concerns of different consumer segments.

For younger consumers, marketing campaigns should focus on the technological advancements and environmental benefits of electric vehicles. These consumers are likely to value the sustainability aspect of EVs and will be more responsive to digital marketing campaigns, social media influencers, and peer recommendations. On the other hand, older generations may need more reassurance regarding the practicality and cost-effectiveness of electric vehicles. Educational campaigns that highlight the long-term savings on fuel and maintenance, as well as the growing infrastructure for EVs, can help alleviate these concerns.

In conclusion, the growing interest in electric vehicles in Kerala, particularly in Thrissur, provides a unique opportunity to study the adoption of green transportation in a region with diverse socio-economic conditions and a mix of urban and rural characteristics. While several barriers remain, such as cost, infrastructure limitations, and consumer awareness, the region's potential for adopting electric vehicles is promising. By addressing these challenges with targeted marketing strategies, expanding infrastructure, and increasing consumer education, Thrissur can become a model for other regions in Kerala and beyond in the adoption of electric vehicles. The role of millennials and Gen Z in shaping the future of the EV market will be crucial, but the broader effort must involve engaging all generations in the transition to a sustainable, eco-friendly transportation system.

PROBLEM STATEMENT

Despite the global momentum towards sustainable transportation, the adoption of electric vehicles (EVs) in Thrissur District, Kerala, remains disproportionately low. This stagnation is not merely a reflection of consumer hesitation but is deeply rooted in a complex interplay of infrastructural, economic, and psychological barriers. While the Indian government has introduced various incentives to promote EV adoption, their effectiveness is often

undermined by inconsistent implementation and lack of awareness among potential consumers. In Kerala, for instance, the government's ambitious targets for EV deployment have faced challenges such as bureaucratic delays and insufficient charging infrastructure, leading to a decline in EV sales from 75,808 units in 2023 to 60,345 units in 2024.

In Thrissur, the situation is further compounded by high upfront costs of EVs, which remain a significant deterrent for middle-class consumers. Additionally, the limited availability of skilled service personnel and the scarcity of service centres specializing in EV maintenance exacerbate concerns regarding the long-term reliability and upkeep of these vehicles. These factors contribute to a phenomenon known as "range anxiety," where potential EV users fear the possibility of running out of battery without access to charging stations. Although the district has seen a rise in charging infrastructure, with several new stations being installed, the coverage remains insufficient, particularly in rural and peri-urban areas.

Moreover, the marketing strategies employed by EV manufacturers and dealerships in Thrissur often fail to resonate with the local populace. There is a noticeable lack of targeted campaigns that address specific regional concerns and preferences.

Promotional efforts are frequently generic and do not leverage digital platforms effectively to engage the tech-savvy younger demographic. This oversight in segmentation and targeting results in missed opportunities to educate consumers about the environmental benefits of EVs and the financial incentives available. The absence of compelling narratives and localized marketing initiatives further entrenches the status quo, making the transition to electric mobility a distant prospect for many residents.

Addressing these multifaceted challenges requires a holistic approach that encompasses policy reform, infrastructural development, and innovative marketing strategies. By fostering a conducive environment for EV adoption through improved incentives, enhanced charging infrastructure, and tailored marketing efforts, Thrissur can pave the way for a sustainable and

inclusive transportation future. This study aims to dissect these barriers in detail, providing actionable insights that can inform stakeholders across government, industry, and civil society to collaboratively drive the EV revolution in the region.

The comprehensive research statement undertaken for the study is:
What are the key factors hindering the adoption of electric vehicles (EVs) in Thrissur District, Kerala, including consumer perceptions, attitudes, and awareness of government incentives, and how do current marketing strategies, impact the willingness of consumers to transition from traditional vehicles to EVs?

This study aims to delve into the underlying issues affecting EV adoption in Thrissur, focusing on consumer behavior, marketing effectiveness, and infrastructural challenges. By identifying and analyzing these factors, the research seeks to provide actionable insights that can inform policy decisions, marketing strategies, and infrastructural developments to promote the widespread adoption of electric vehicles in the region

RATIONALE OF THE STUDY

The automobile and transportation sector are a significant contributor to air pollution, contamination of air quality, noise pollution as well as greenhouse gas emissions, accounting for approximately 23% of global emissions. India, with its rapidly growing economy, is experiencing an increase in vehicle ownership, leading to rising emissions. To manage this with better methodologies, the Indian government has set ambitious targets to promote electric vehicles (EVs) aiming for 30% of new vehicle sales to be electric by 2030. To support the development of sustainable transportation policies, given the Indian government's push for electric mobility and the lack of regional-specific research, this research investigates consumer perceptions and adoption barriers of electric vehicles in Thrissur district, providing valuable insights for policymakers and industry stakeholders.

OBJECTIVES OF THE STUDY

- To analyze consumer perceptions and attitudes towards electric vehicles (EVs) in Thrissur District, Kerala, and understand how these factors impact adoption.
- To identify key adoption barriers that are influencing marketing of electric vehicles (EVs).
- To suggest effective marketing strategies for overcoming adoption barriers.
- To provide recommendations for market penetration and policy interventions.

HYPOTHESIS OF THE STUDY

H1: Younger consumers (18–35 years) are more likely to adopt EVs than older consumers.

H2: Awareness of government incentives positively influences consumer intention to purchase EVs.

H3: Perceived high cost and lack of charging infrastructure negatively affect EV adoption.

H4: Positive environmental attitudes significantly increase willingness to adopt EVs.

H5: Effective marketing strategies (including digital campaigns) improve consumer awareness and acceptance.

RESEARCH METHODOLOGY

Research Design

This research follows a descriptive and exploratory design. The descriptive aspect focuses on identifying and describing the current state of consumer perceptions regarding electric vehicles, while the exploratory component seeks to uncover the underlying factors influencing these perceptions and barriers to EV adoption. The study's design allows for both a broad understanding of the market landscape and a detailed exploration of specific consumer behaviors and attitudes.

Primary Research

The primary data was gathered through a Google survey, designed to capture feedback from a diverse group of respondents in Thrissur. The survey was structured to collect both quantitative and qualitative data, enabling a mixed-methods approach for more robust analysis. The survey targeted individuals aged 18 and above, ensuring a range of perspectives across actively engaged with automobiles.

Survey Design

The Google survey was developed with a set of structured questions aimed at evaluating key aspects such as:

- Consumer awareness of electric vehicles.
- Perceptions of EV performance, cost, and environmental benefits.
- Factors influencing purchase decisions, including government incentives, charging infrastructure, and vehicle range.
- Barriers to adoption, such as high initial costs, limited charging stations, and uncertainty about maintenance.
- Preference for marketing and communication strategies.

The survey included a mix of Likert scale questions (to measure consumer perceptions and attitudes), multiple choice questions (to capture demographic data and specific preferences), and open-ended questions (to gather in-depth qualitative insights). This allowed for a comprehensive understanding of consumer sentiment.

Sampling Method

The target population for the survey was residents of Thrissur, Kerala. A non-probability convenience sampling method was method was used to reach respondents, ensuring a balance of age groups, with particular emphasis on millennials and Gen Z. These groups were prioritized as they are generally considered to have more positive attitudes toward evolving technology. However, feedback from all age groups was collected, providing a

holistic view of the consumer base. **150 respondents** participated in the survey, offering sufficient data for meaningful analysis.

In research, the determination of an appropriate sample size is crucial to ensure that the findings are both statistically significant and reflective of the broader population. For the study on the adoption and marketing of electric vehicles (EVs) in Thrissur, Kerala, a sample size of 150 respondents has been selected. This essay outlines the rationale behind this choice, considering statistical principles and practical constraints.

Statistical Considerations

A sample size of 150 is deemed sufficient for basic statistical analyses, such as descriptive statistics and simple cross-tabulations. This size allows for meaningful insights into the attitudes and behaviours of the target population. For instance, with a 95% confidence level and a margin of error of $\pm 8\%$, a sample size of 150 can provide reliable estimates for the population's characteristics. This balance between confidence and precision is often acceptable in social science research, especially when dealing with exploratory studies or limited resources.

Population Size and Margin of Error

Assuming the total population of potential EV consumers in Thrissur is estimated to be around 10,000, a sample size of 150 represents 1.5% of the population. This proportion is typically adequate for drawing generalizable conclusions in market research. The margin of error indicates the range within which the true population parameter is expected to lie. A margin of error of $\pm 8\%$ is considered reasonable for this study, balancing the need for accuracy with practical constraints.

Practical Constraints

Given the time and resource limitations often associated with field surveys, a sample size of 150 is a practical choice that balances statistical reliability with feasibility. It allows for in-depth analysis without overwhelming the research process. Additionally, this sample size is

manageable in terms of data collection and analysis, ensuring that the study can be completed within the project's timeframe and budget.

Secondary Research

Secondary data was collected through a review of existing literature, reports, and case studies relevant to electric vehicles. Sources included:

- Industry reports on electric vehicle adoption in India and globally.
- Government policies and initiatives promoting EV adoption in Kerala.
- Case studies of successful Ev markets in similar regions.
- Academic literature on consumer behavior, and market adoption barriers, and marketing strategies for new technologies.

This secondary research provided the necessary context to compare the findings from Thrissur with broader trends, allowing for a more informed analysis and the formulation of effective marketing strategies.

Data Analysis

In the study of electric vehicle (EV) adoption in Thrissur, Kerala, a comprehensive descriptive analysis was conducted to understand consumer perceptions, attitudes, and awareness of government incentives. This approach utilized various data collection and analysis tools, including Google Forms for survey distribution, Excel for data organization, Power BI for visualization, and pivot tables for detailed analysis. The research employed purposive sampling to select participants who could provide valuable insights into the EV adoption process.

Tools for Analysis:

Google Forms was used to design and distribute the survey, ensuring a user-friendly interface for respondents. The survey included questions tailored to capture information on consumer demographics, attitudes towards EVs, awareness of government incentives, and

factors influencing purchasing decisions. The responses were automatically collected and stored in a linked Google Sheet, facilitating easy access and organization of data.

Microsoft Excel was employed to clean and preprocess the data. This involved removing incomplete or inconsistent responses, categorizing data into relevant groups, and preparing the dataset for analysis. Excel's functionalities, such as sorting, filtering, and basic statistical functions, were utilized to gain preliminary insights into the data.

Power BI was leveraged to create interactive visualizations that provided a clear understanding of the data. Visual tools like bar charts, pie charts, and heat maps were used to represent the distribution of responses across different variables, such as age groups, income levels, and awareness of government incentives. These visualizations helped in identifying patterns and trends within the data.

Pivot tables in Excel were used to perform more detailed analyses. By cross-referencing multiple variables, pivot tables allowed for the examination of relationships between factors such as age and EV awareness, or income level and purchasing intent. This facilitated a deeper understanding of the underlying factors influencing EV adoption in the region.

Sampling Method

The research employed a non-probability sampling method, where participants were selected based on specific criteria relevant to the study. In this case, individuals who were legally eligible to participate in the survey, i.e., above the age of 18, were considered. This approach ensured that the sample included respondents who could provide meaningful insights into the factors affecting EV adoption in Thrissur. Non-probability sampling is particularly useful in exploratory studies where the goal is to gain in-depth understanding rather than generalize findings to a larger population.

Target Demographics and Generation Analysis

A significant aspect of the research involved understanding generational differences, particularly focusing on millennials and Gen Z consumers, who tend to have more favorable views toward new technology and are more likely to adopt electric vehicles. These generations are generally seen as less eccentric and more open to technological advancements, making them ideal candidates for early EV adoption. However, the study also included feedback from older age groups, who are actively involved in dealing with automobiles and could represent a significant market for electric vehicles, especially if certain barriers are addressed.

Ethical Considerations

The study adhered to ethical research standards. All survey respondents participated voluntarily and were informed of the study's purpose. Data was collected anonymously to protect the privacy of participants, and no personal information was shared or used in a way that could identify individual respondents.

LIMITATIONS OF THE STUDY

While the study aims to provide valuable insights into the feasibility of marketing electric vehicles (EVs) in the Thrissur district of Kerala, there are several limitations that must be acknowledged to contextualize the findings and recommendations:

1) Sampling Method

The data for this study was collected using a non-probability convenience sampling method. Although more than 100 respondents from Thrissur participated in the survey, the sample may not be fully representative of the broader population of the district. Convenience sampling can introduce bias, as participants may not be a random cross-section of the population, and their responses might not fully reflect the views of those who are less likely to engage in online surveys or who have differing socio-economic backgrounds. While

efforts were made to include a variety of age groups, the sample was skewed towards those already active in dealing with automobiles, potentially limiting insights from individuals with less exposure to the EV market.

2) Respondent Bias

As the survey was conducted online via Google Forms, there is a possibility that respondents who participated may have had prior interest or knowledge about electric vehicles. This may have led to an overrepresentation of respondents who are already predisposed to EV adoption or, conversely, those with stronger opinions against it. This selection bias may influence the results, particularly when assessing consumer perceptions and barriers to adoption, as individuals without direct interest in EVs might have been less inclined to respond.

3) Geographical Limitation

The scope of the study is geographically limited to Thrissur district, which may not necessarily represent the consumer behavior and perceptions of other districts or regions in Kerala or India as a whole. Kerala's unique socio-economic and cultural characteristics could influence EV adoption differently in other parts of the state, potentially limiting the generalizability of the findings. The study focused on understanding local consumer behaviors, but further research in other regions could provide a more comprehensive national picture.

4) Time Constraints

Due to time limitations in completing the MBA final year project, the survey period was relatively short, which may have affected the ability to gather more diverse responses. A longer survey period could have allowed for a broader sample size and deeper insights, as well as more opportunities for follow-up responses to clarify ambiguities or gather more detailed information.

5) Limited Depth of Descriptive Data

While qualitative data from open-ended questions provided useful insights, the depth of these responses was limited due to the online survey format. Participants might not have elaborated as extensively as they would have in face-to-face interviews or focus groups, which can offer richer insights into personal experiences, perceptions, and concerns. Without the opportunity to probe deeper into responses, the qualitative analysis relied on surface-level information, which may not capture the full complexity of consumer attitudes.

6) Technological Constraints

The analysis of survey data was conducted using Power BI and pivot tables, both of which are powerful tools for analyzing and visualizing large datasets. However, these tools may not have captured more nuanced trends or patterns that could have been identified through more sophisticated qualitative analysis methods or advanced statistical techniques. Moreover, some limitations related to the interpretation of visualizations exist, as graphs and charts, while effective in presenting trends, may oversimplify complex responses and fail to convey the subtleties behind consumer opinions.

7) Exclusion of Non-Internet Users

Given that the survey was conducted online, it excludes individuals who do not have access to the internet or who are not comfortable with digital tools. This is a significant limitation, as it is possible that a portion of the population in Thrissur, particularly in rural or less tech-savvy areas, was not represented in the study. This could skew the findings towards more urban and internet-savvy demographics, who may have different perspectives on electric vehicles compared to those without internet access.

8) Rapidly Changing Market Dynamics

The electric vehicle market in India is evolving rapidly, with frequent changes in government policies, technological advancements, and market conditions. These dynamic factors could affect consumer perceptions over time. For example, new incentives,

improvements in EV technology, or changes in fuel prices could influence the findings if the study was conducted at a later date. The results, therefore, provide a snapshot of consumer perceptions at a particular point in time and may not fully capture future shifts in market dynamics.

9) Generational Focus and Bias

While the study particularly considered the perspectives of millennials and Gen Z due to their potential for greater adoption of new technologies, the focus on these generational groups might have unintentionally downplayed the perspectives of other groups. Although feedback was collected from respondents across all age groups, the emphasis on younger generations with more progressive views on technology may have led to an overrepresentation of opinions favorable to EVs. Conversely, older age groups, who might be more resistant to adopting EVs due to concerns about infrastructure or costs, might have been underrepresented in the data.

10) Lack of Longitudinal Analysis

The study captures consumer opinions at a single point in time, without the ability to track changes in perceptions over an extended period. A longitudinal study would have been beneficial in understanding how attitudes toward electric vehicles evolve as more information becomes available, as policies change, or as the EV market matures in Thrissur. Such an analysis could have provided insights into the long-term feasibility and potential for EV adoption in the district.

Despite these limitations, the research provides meaningful insights into the perceptions and barriers to the adoption of electric vehicles in Thrissur, Kerala. The findings contribute to a deeper understanding of consumer attitudes and serve as a foundation for future studies, marketing strategies, and policy recommendations aimed at promoting EV adoption in the region.

CHAPTER 2
REVIEW OF RELATED LITERATURE

LITERATURE REVIEW

The increasing global concern over environmental degradation and climate change has resulted in significant efforts toward sustainable development. One of the key strategies emerging from this global shift is the widespread adoption of Electric Vehicles (EVs), a technology with the potential to reduce greenhouse gas emissions and dependence on fossil fuels. In India, and particularly in the state of Kerala, the adoption of EVs is gradually gaining momentum. However, various market barriers, consumer perceptions, governmental policies, and evolving marketing strategies significantly shape the landscape of EV adoption. This literature review synthesizes recent research to better understand the driving forces behind EV adoption, the marketing challenges faced by the industry, and how Kerala's policies and infrastructure are influencing this shift.

Market Potential and Barriers

India's potential as one of the largest untapped EV markets globally is undeniable. As one of the largest automobile markets in the world, India presents an exceptional opportunity for the widespread adoption of electric vehicles. Hema and Venkatarangan (2021) emphasize that India's position as an emerging EV market is significant due to the combination of an expanding middle class, increasing concerns over air pollution, and a growing willingness to invest in sustainable technology. However, the transition to electric mobility is not without its challenges. Hema and Venkatarangan (2021) note that the infrastructure to support EVs—specifically, charging stations—remains insufficient. This poses a significant barrier to mass adoption, as many consumers fear the inconvenience of insufficient charging facilities, particularly in semi-urban and rural areas, where EV infrastructure is still underdeveloped.

In addition to charging infrastructure, the lack of local production of critical components such as lithium-ion batteries further hampers the affordability and accessibility of EVs. The "Make in India" initiative has been introduced as a measure to reduce dependency on imports for key EV components, specifically batteries. Without a reliable, cost-effective

local supply chain, Indian consumers may face prohibitively high prices for electric vehicles, further delaying adoption (Hema & Venkatarangan, 2021). The researchers suggest that government policies promoting local manufacturing could have a significant impact on reducing costs, ultimately making EVs more affordable for the average Indian consumer.

Khan (2023) further addresses the challenges faced in achieving the ambitious 30% EV penetration target set by the Indian government by 2030. Khan highlights that while the EV market is expanding, it remains in a nascent stage. Despite the availability of government incentives and the rise in environmental consciousness, a few core obstacles continue to hinder mass adoption. High initial purchase costs, especially for electric cars, and the lack of reliable, widespread charging infrastructure are the most commonly cited deterrents. Additionally, many consumers still show a preference for petrol and diesel vehicles due to their perceived lower initial costs, familiar technology, and the well-established refueling infrastructure.

Consumer Awareness and Adoption

The role of consumer awareness in EV adoption cannot be overstated. According to Dobhal and Ruchitha (2024), a critical factor influencing the decision to purchase EVs is consumer awareness. Many consumers, especially in Kerala's urban centers like Thrissur, are still not fully aware of the long-term economic and environmental benefits of EVs. Among the youth demographic, there is growing awareness about the environmental impact of traditional internal combustion engine vehicles, yet many still perceive EVs as expensive and impractical due to a lack of information regarding the true cost of ownership, performance features, and available government subsidies.

Dobhal and Ruchitha's (2024) study on youth perceptions specifically notes that women are more inclined towards electric two-wheelers than their male counterparts. This is an interesting observation that could shape marketing strategies in Kerala, particularly in

Thrissur, where the population is steadily becoming more environmentally conscious. The female demographic, often seen as decision-makers in household purchases, may be more open to adopting sustainable transportation solutions if provided with sufficient information and tailored marketing.

In a related study, Sreeja and Vennila (2024) focus on consumer preferences in Calicut, Kerala, which shares socio-economic similarities with Thrissur. Their study reveals that price sensitivity is one of the most significant factors influencing the decision-making process for potential EV buyers. In Kerala, where disposable incomes are moderate but the cost of living is high, the perception of EVs as "expensive" remains a significant barrier. However, once consumers are made aware of the long-term savings on fuel and maintenance, they are more likely to consider purchasing electric two-wheelers. The researchers also observed that the availability of charging stations and the performance satisfaction of early adopters play crucial roles in influencing others' willingness to purchase EVs.

Future Prospects and Policy Framework

The Indian government's goal of reducing its oil import bill, lowering air pollution, and contributing to climate change mitigation has led to the formulation of various EV-friendly policies. Shrivastava (2021) underscores the transformative potential of EV adoption in India, particularly in its economic and environmental impacts. The environmental benefits of transitioning to EVs are immense, especially in urban areas where air pollution is a major issue. By reducing the number of internal combustion engine vehicles on the road, India can significantly reduce its greenhouse gas emissions.

The Kerala State Electric Vehicle Policy, as articulated by the Kerala State Electricity Board (KSEB) in 2023, is a critical component of the state's push towards electric mobility. Kerala, with its progressive stance on environmental issues, became one of the first states in India to implement a comprehensive EV policy in March 2019. The policy

not only outlines incentives for consumers, such as subsidies and tax rebates, but also includes measures to foster the development of a robust EV ecosystem. These initiatives are designed to create an enabling environment for electric mobility through the establishment of charging infrastructure and the encouragement of local EV manufacturing. The Kerala government also aims to convert the entire fleet of the State Road Transport Corporation to electric vehicles by 2025, which would significantly contribute to reducing carbon emissions.

KSEB (2023) also highlights infrastructure development as a key element of the policy, with plans to establish 20 public charging stations, 150 battery swapping stations, and bulk charging solutions across major cities in Kerala, including Thrissur. These measures are designed to address the most significant concerns related to EV adoption—range anxiety and charging convenience. By focusing on infrastructure, Kerala is positioning itself as a leader in the national EV transition, which will have a direct impact on the adoption rates of electric vehicles in Thrissur.

Government Policies and Initiatives
The comprehensive approach taken by the Kerala government reflects the proactive nature of the state in fostering sustainable and clean transportation. The Kerala Electric Vehicle Policy not only provides fiscal incentives to consumers but also creates a conducive environment for the establishment of local charging infrastructure and battery swapping stations. According to Evreporter (2023), one of the most ambitious goals of the policy is the creation of a "lighthouse region" in key urban areas, where EV adoption will be piloted and monitored. Thrissur, as one of Kerala's growing urban hubs, stands to benefit immensely from this initiative.

The state policy also targets a significant reduction in air pollution, an issue that has become increasingly critical in urban centers like Thrissur. The implementation of a large-scale electrification of public transport buses and two-wheelers can directly contribute to

improving air quality and reducing urban congestion. These initiatives are expected to not only help meet local environmental goals but also position Kerala as a model for other states to follow in India.

In addition to these state-level initiatives, the central government's Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme has provided substantial financial support to EV manufacturers and consumers alike. This scheme, along with additional subsidies for EV buyers, serves to make electric vehicles more accessible to a broader demographic, including the middle-income group that constitutes the majority of the population in cities like Thrissur.

Marketing Challenges and Consumer Preferences
Despite the strong governmental push, marketing challenges remain a critical barrier to EV adoption. Khan (2023) suggests that despite significant government incentives, many potential buyers remain unaware of the long-term economic benefits of EVs, such as lower fuel and maintenance costs. Marketing strategies that focus on educating consumers and dispelling myths around EV ownership are crucial. Consumer education is particularly important in Kerala, where potential buyers may perceive EVs as too costly or impractical without understanding the financial incentives, lower operational costs, and environmental advantages.

Furthermore, the marketing of EVs must also address the traditional cultural attachment to petrol and diesel vehicles. In Kerala, as in many parts of India, the internal combustion engine has long been the standard mode of transportation, and the shift to electric vehicles requires overcoming a deep-seated preference for conventional vehicles. Khan (2023) suggests that targeted marketing campaigns that focus on the environmental benefits, government subsidies, and long-term cost savings will be more effective than generic advertisements. Digital marketing, in particular, can play a pivotal role in reaching younger

and tech-savvy consumers, who are increasingly turning to online platforms for information and purchasing decisions.

Technological Advancements and Market Dynamics

The role of technological advancements in facilitating EV adoption cannot be understated. Shrivastava (2021) emphasizes that continuous innovation in battery technology is crucial to reducing the costs of electric vehicles and improving their performance. As battery technology evolves, we are likely to see longer driving ranges, shorter charging times, and lower overall vehicle prices, all of which will make EVs more attractive to consumers. Furthermore, advancements in battery recycling and second-life battery usage are expected to further reduce costs and improve the sustainability of electric vehicles.

The growing accessibility of fast-charging infrastructure also plays a pivotal role in increasing EV adoption. As more charging stations are built in urban and suburban areas, including Thrissur, consumers will be more likely to adopt electric vehicles, knowing that they have convenient access to recharging solutions. The future of electric mobility, therefore, hinges on continuous technological advancements that lower costs, improve performance, and ensure convenience for users.

Environmental and Economic Implications

The environmental and economic benefits of transitioning to electric mobility are enormous. By adopting EVs, India can significantly reduce its dependence on fossil fuels, which currently account for a large proportion of the country's energy imports. This, in turn, could help reduce the country's trade deficit and improve economic stability. In addition, EVs are key to reducing urban air pollution, which has become a major health issue in cities across India. Sreeja and Vennila (2024) further reinforce that consumer satisfaction with EV performance and value for money is a significant factor in accelerating market penetration. Their research shows that consumers who have had positive experiences with electric vehicles are more likely to become advocates for the technology, influencing others in their community to adopt EVs.
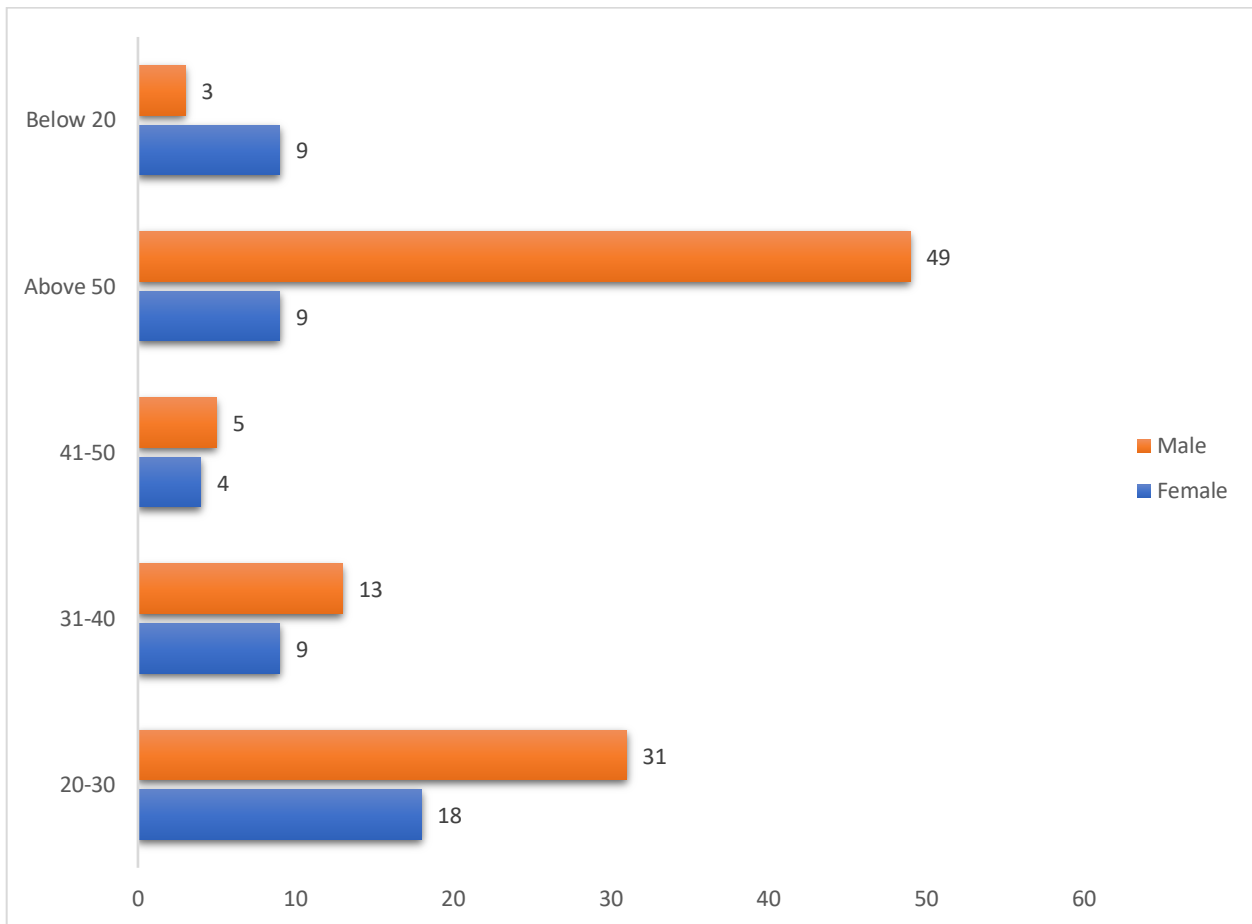
CHAPTER 3
DATA ANALYSIS AND
INTERPRETATION

DATA ANALYSIS AND INTREPRETATIONS

When data has been obtained, it is necessary to organize them for the interpretation.
Qualitative data may have to be summarized and treated statistically to make significant
clean."   **Olive R.A.G.**

GRAPHICAL REPRESENTATION AND STATEMENTS OF 'NUMBER OF RESPONDENTS' WITH AGE, GENDER SPECIFICATION AND EMPLOYMENT STATUS

DEMOGRAPHIC ANALYSIS AND GRAPHICAL REPRESENTATION OF RESPONDENTS

In this study exploring the barriers to marketing and adoption of electric Vehicles (EVs) in Thrissur, feedback was collected from **150 respondents.** The age distribution of participants was grouped into five key categories for clarity and better visualization

These groupings were visualized using bar graphs and pivot tables. While data was collected across all age brackets, the analysis have particularly have envisioned to

categorically highlight insights from the Gen Z and Millennials (ages 18 – 40) who are more likely to offer constructive feedback and engage with evolving technologies like EVs. Older age group while considered relevant as they use EVs if accessible to them in these current times, however they might be analyzing the usage of EVs through the lens of entrenched comfort and habitual use of fuel vehicles.

As it is visually represented in a visually compelling graphical excel pivot graph representation:

- **Orange** represents **male respondents**
- **Dark Blue** represents **female respondents**

'Across each age group '
I.e. categorized into

- **Below 20 years**
- **20 – 30 years**
- **31 – 40 years**
- **41 – 50 years**
- **Above 50 years**

And **the number of respondents according to each age and specified gender are vividly depicted in the graphical data representation.**

Although the survey included options of inclusivity and had options considered for minority genders identities as well but seemingly while for this survey conducted it wasn't recorded reflecting a limitation in sample inclusivity.

This demographic breakdown both in numbers and in visual colors representation provide a clear foundation for understanding public perception, age-based openness, and gender patterns related to EV awareness and adoption in Thrissur.

EMPLOYMENT STATUS OF THE RESPONDENTS TO REINFORCE THE SOCIAL CREDIBILITY OF THE DATA

To further reinforce the authenticity and social credibility of the data, a separate graph was generated to represent the employment status of the respondents.

The categories included:

- **Student**
- **Employed**
- **Unemployed**
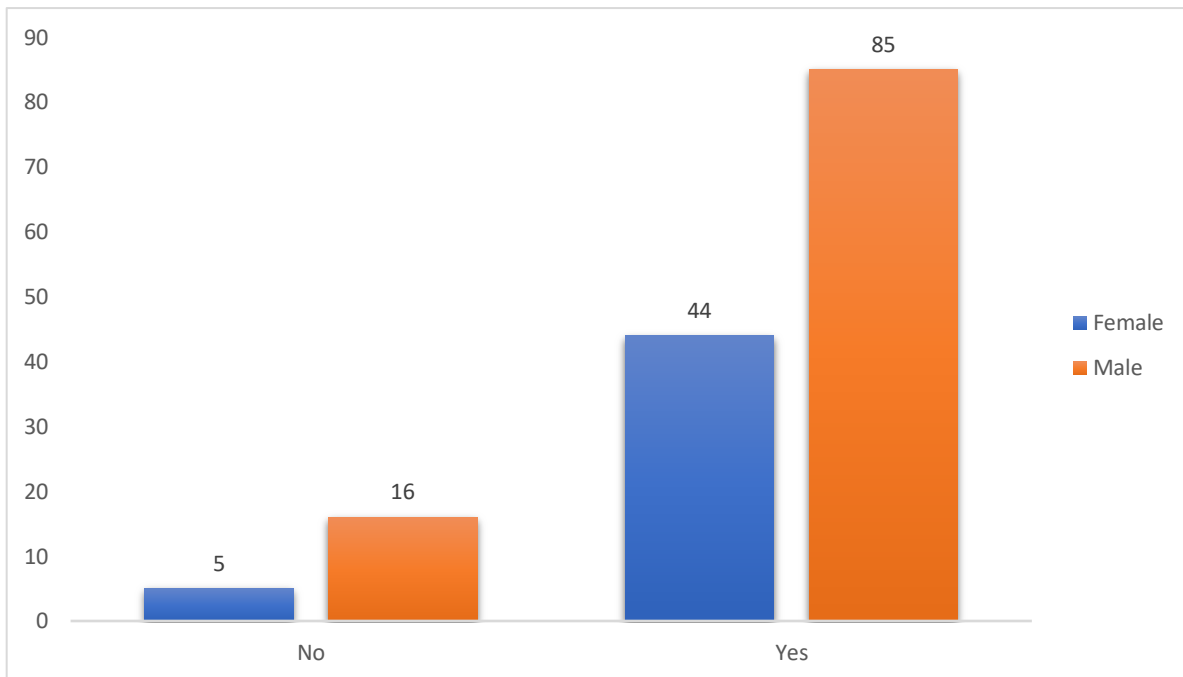- **Home maker**
- **Retired**
- **Others**

This segmentation aids in understanding the socio-economic background of the respondents, ensuring that the feedback stems from a mix of practical users, potential adopters and critical observers.

This graph again shows employment status with each designated with gender categorized specified numbers being depicted which are respondents received and in this case as well similarly, **Orange being depicted for male respondents and dark blue for female respondents.**

Together, these demographic graphs provide a foundational layer for analyzing public awareness, trust, and perceived challenges in EV adoption across Thrissur Population.

ANALYSIS OF
FAMILAIRITY AND EXPOSURE AND
OWNERSHIP OF EVs

GRAPHICAL ANALYSIS ON FAMILIARITY WITH ELECTRIC VEHICLES (EVs) BASED ON GENDER

A bar graph representation was created using pivot table to assess gender wise familiarity with the concept of Electric Vehicles (EVs). The graph utilized a color code scheme, where orange bars represent male respondents and dark blue female respondents. The data distinctly shows the number of respondents who indicated "Yes "or "No "to being familiar with EVs.

Out of the 150 respondents surveyed:

- **85 male and 44 female** respondents reported being **familiar** with the concept of EVs.
- **16 male and 5 female** respondents reported being **unfamiliar** with EVs.

The graphical insight highlights a significant majority across both genders who are aware of EVs, indicating that lack of awareness may not be a dominant hinderance in the adoption of EVs within the sample population. However, the presence of a smaller segment still unfamiliar with EVs suggests the need for continued outreach and awareness campaigns, especially targeting segments less exposed to emerging vehicle technologies.

GRAPHICAL ANALYSIS ON FAMILIARITY WITH ELECTRIC VEHICLES (EVs) AMONG AGE 18 -40

Above is a graphical representation of Age group 18 – 40 were

3 male responses were 'No 'and 44 male responses were 'Yes '

1 female response were 'No 'and 35 female responses were 'Yes '

This graphical analysis illustrates the level of awareness about electric vehicles among respondents aged 18 – 40, represented using a Power BI donut chart. As mentioned previously in the statements, this specific age group was chosen deliberately, as younger individuals are generally more receptive to technological advancements and capable of offering nuanced, constructive criticism.

The data clearly shows that within this age range, there is high level of awareness about electric vehicles, especially among males. This suggest the youth in Thrissur are largely informed about EVs, making them valuable contributors to understanding adoption patterns and barriers.

GRAPHICAL ANALYSIS OF ELECTRIC VEHICLE OWNERSHIP

Pivot Table graphical representation for 150 survey respondents on ownership of Electric Vehicles

The graphical representation based on survey responses from 150 individuals, provides a categorical breakdown of Electric Vehicle (EV) ownership across different occupational segments – employed, homemaker, others, retired and students – further divided by gender.

- Among the **employed,** the majority **19 females and 41 males** reported **not owning an EV**, while small number, **1 female and 4 males indicated ownership.**

- In the **homemaker category** which shown to have no male respondents, where the **4 female respondents reported not owning an EV.**

- The **"Others "category**, comprising respondents who do not fit into standard occupational brackets, showed a similar trend, with **4 females and 3 males stating they do not own an EV.**

- In **Retired group**, a significant number **4 females and 41 males reported no ownership**, while **1female and 6 males indicated they do own an EV.**

- Finally, among **"Students "14 females and 6 males reported no ownership,** while only **2 female confirmed ownership**, no responses received among male student categories owning an EV.

This collective data indicates a low overall penetration of EV ownership across all occupational groups, with employed and retired males showing highest though still modest, levels of adoption

GRAPHICAL ANALYSIS OF ELECTRIC VEHICLE OWNERSHIP AMONG AGE GROUP 18 - 40

Power Bi Donut Graphical representation on Electric vehicle ownership 44 Males and 33 females indicating No ownership of EVs and 3 females and 3 males having ownership of Electric vehicles.

This graphical analysis focuses on Electric vehicles (EV) ownership within the age group of 18 – 40, a demographic intentionally chosen for their greater familiarity with evolving technologies and their potential to offer more informed and constructive feedback. The Power BI donut chart visually represents the gender-wise distribution of EV ownership in this age bracket.

Among male respondents, three individuals reported owning an EV, while 44 stated they do not. Among female respondents, 3 individuals confirmed EV ownership, whereas 33 indicated non ownership.

The data highlights a notably low rate of EV adoption among the younger population, despite their assumed openness to technological shifts.

This suggests that factors beyond awareness – such as affordability, infrastructure or perceived practicality—maybe influencing the decision not to own electric vehicles, even among the more tech aware generation.

REVEALING THE GAP: HIGH AWARENESS, LOW OWNERSHIP – A PRELUDE TO ADOPTION BARRIERS IN THRISSUR'S EV LANDSCAPE

The current analysis uncovers a notable disparity between awareness and ownership of electric vehicles among the 150 respondents surveyed in Thrissur, Kerala. While the majority, especially within the tech savvy 18 – 40 age group, demonstrate strong familiarity with EV concepts, actual ownership remains low across all age and occupational categories. This contrast becomes especially significant considering that the younger population, typically more open to innovation, also shows minimal adoption. These findings point toward deeper systemic hinderances—ranging from accessibility and infrastructure to affordability and infrastructure to affordability and trust – which could be obstructing the marketing and adoption of EVs in the region. These early observations set the foundation for understanding the key obstacles in expanding electric mobility in Thrissur.

ANALYSIS ON COMFORT COMPARISON OF EVs WITH FUEL VEHICLE AND EXPERIENCE OF EVs FEEDBACKS

GRAPHICAL ANALYSIS OF COMFORT SATISFACTION: ELECTRIC VEHILCES vs FUEL VEHICLES AMONG 150 RESPOONSES

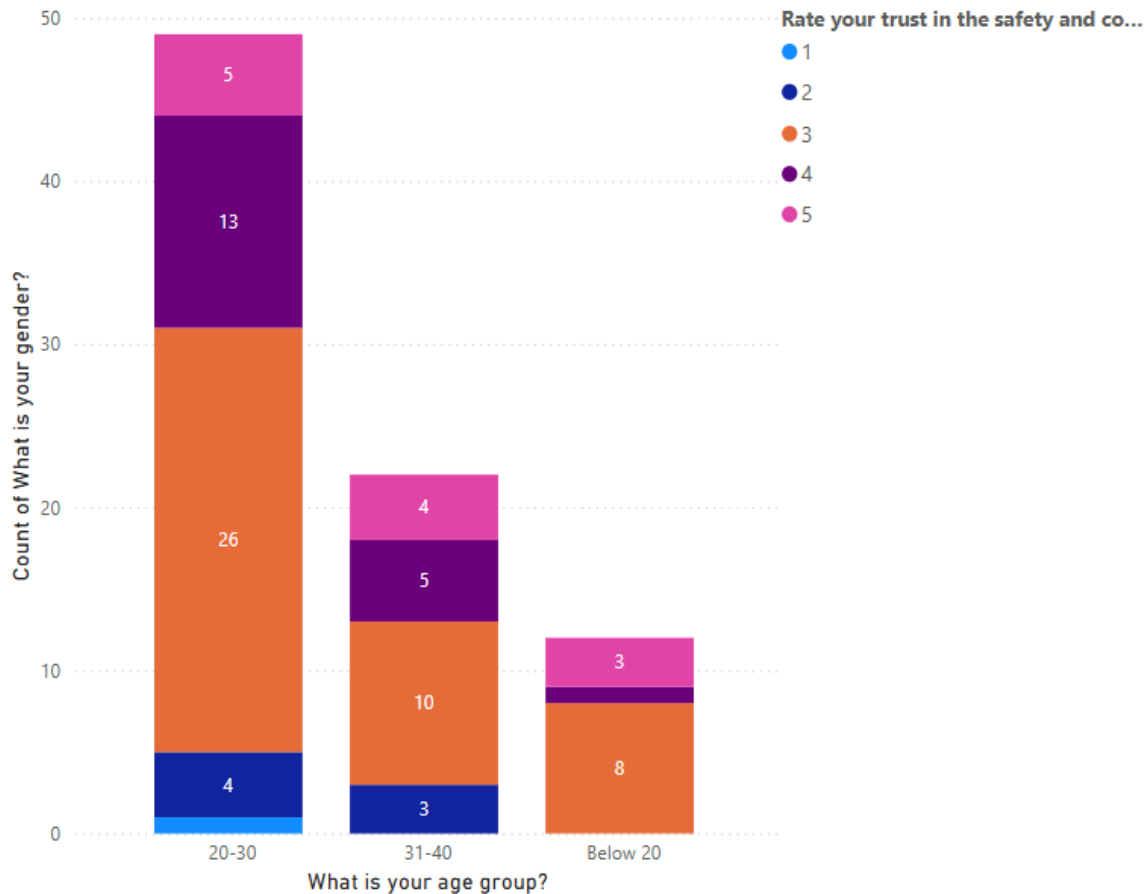**Pivot Table analysis on comfort rating feedback responses of EVs compared with Fuel Vehicles.**

The graphical representation provided offers a comparative analysis of the comfort satisfaction ratings between Electric Vehicles (EVs) and traditional fuel vehicles, as **assessed by 150 respondents** in the survey on adoption and marketing hindrances for electric vehicles. **The ratings were given on a scale from 1 to 5, with 1 indicating low comfort and 5 indicating the highest comfort.** The data was categorized by gender, with both male and female respondents contributing to the ratings.

Among the respondents, 8 males rated the EV comfort as 1 with no female responses reporting, indicating low satisfaction, while only 1 female and 9 male (10 Individuals) gave the rating 2 which again is giving low satisfaction feedback. **The majority of respondents rated the EV comfort higher, with 18 males and 27 females (45 Individuals) giving a rating of 3, suggesting a moderate level of satisfaction. The ratings of 4 and 5 were more prominent, with 17 females and 33 (51 Individuals) males rating the comfort level as 4,** indicating a relatively good level of satisfaction with EV comfort compared to fuel vehicles. Furthermore, 13 females and 24 males (37 Individuals) gave the highest rating of 5, signifying high satisfaction with the comfort of electric vehicles.

This data reflects a noticeable difference in the perceived comfort between electric and fuel vehicles, indicating that while the EVs are rated highly by a significant portion of the respondents, there is still a sizable proportion who feel that EVs fall short in terms of comfort when compared to fuel vehicles.

This analysis provides insight into the critical factors influencing the adoption of electric vehicles, suggesting that while comfort may not be the most prominent hindrance, it does play a role in the overall perception of EVs.

GRAPHICAL ANALYSIS OF COMFORT SATISFACTION: ELECTRIC VEHILCES vs. FUEL VEHICLES OF AGE GROUP 18 - 40
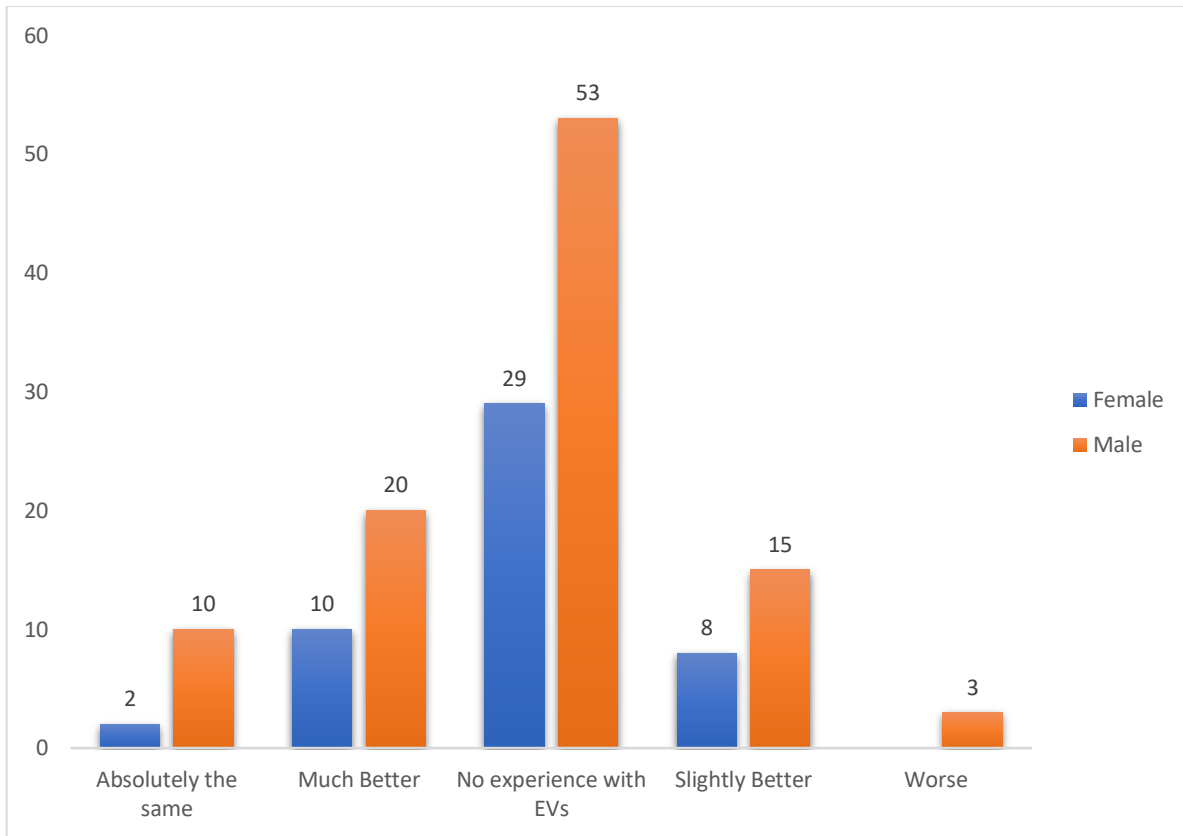

Power BI graphical analysis on comfort rating responses categorically among from age group 18 – 40

The bar graph presents a comparative comfort rating of electric vehicles versus fuel vehicles, collected from respondents aged eighteen to forty—a group considered more attuned to technological advancements and critical thinking around evolving mobility solutions. **The ratings were given on a scale from 1 to 5, with 1 indicating low comfort and 5 indicating the highest comfort.** The data was categorized by age, showing each age giving number of respondents contributing to the ratings.

The data reflects a strong middle-ground sentiment, with a majority rating EV comfort at level three, particularly among the twenty to thirty age group, suggesting moderate satisfaction but room for improvement. While very few rated EV comfort as low (one or two), higher ratings (four and five) also appeared less frequently, indicating that while the younger generation is familiar with EVs, they are not entirely convinced of their comfort advantage over traditional fuel vehicles. This contrast highlights key areas of opportunity in improving the perception and actual comfort of EVs to boost adoption within this informed and potential-heavy demographic.

GRAPHICAL ANALYSIS ON PERCEPTION OF ELECTRICAL VEHICLE EXPERIENCE COMPARED TO FUEL VEHICLES AMONG 150 RESPONDENTS

**Pivot graphical analysis on perception of experience of
Electric Vehicles compared to Fuel vehicles among 150 responses.**

To assess the general perception of electric vehicles in comparison to fuel-based vehicles, a pivot bar graph was created based on gender-wise responses from 150 participants in Thrissur. The responses were categorized under five experience-based options: "Absolutely the same," "Much better," "Slightly better," "Worse," and "No experience with EVs."

The majority of respondents—82 individual responses—indicated they had no experience with electric vehicles, highlighting a significant awareness and exposure gap.

Meanwhile, with least majority responses that are leaning towards **those whom have experience with EVs depicts that 30 females and males combined felt EVs were "much better" than fuel vehicles, and 23 individual responses provided "slightly better ".**

While only a small number rated the experience as "worse," with responses from just three males.

This distribution showcases both the curiosity and hesitation around EV adoption, with a **clear indication that lack of personal experience is one of the major hindrances in forming opinions and driving further adoption.**

GRAPHICAL ANALYSIS ON PERCEPTION OF ELECTRICAL VEHICLE EXPERIENCE COMPARED TO FUEL VEHICLES AMONG AGE GROUP 18 – 40 RESPONDENTS

Pivot graphical analysis on perception of experience of Electric Vehicles compared to Fuel vehicles with age group 18 - 40.

A focused pivot table bar graph analysis was conducted among the age group of eighteen to forty, recognizing this segment as the younger, tech-savvy population with greater exposure to evolving vehicle technologies. Participants were asked to rate their EV experience through five categories: "Absolutely the same," "Much better," "No experience with EVs," "Slightly better," and "Worse." The responses were further categorized into three age brackets: below twenty, twenty to thirty, and thirty-one to forty.

In the graph it clearly shows that in the analysis among age group eighteen to forty highest number is among i.e. 39 individual responses in "No experience with EVs ".

And among those least majority of people who are those categories of people having experience with the EVs have given most majority towards "better feedbacks' i.e. 17 individual responses giving "much better "feedbacks and 16 individual responses giving "slightly better "feedbacks.

7 number of individuals have given responses showing they relatively felt no difference with EVs and just 1 person gave response having worst experience with EVs

The analysis suggests relatively worst experiences indicated among this tech savvy age individuals are really low and with the experienced people responses shown having to lean to favorable and better responses, but there are distinctively high number on not having experience with EVs. In an overview of the numbers provided suggests growing potential for adoption, provided exposure and hands-on access to EVs increases in the future.

PRELIMINARY ANALYSIS ON THE HINDRANCES TO ELECTRIC VEHICLE ADOPTION IN THRISSUR, KERALA: ANALYSING SATISFACTION, PERCEPTION, FAMILIARITY AND OWNERSHIP TRENDS OF EVS

The preliminary analysis of responses collected for the study on the hinderances to adoption and marketing of electric vehicles (EVs) in Thrissur district, Kerala, provides key insights into both perceptual and practical barriers that continue to limit the growth of EV usage in the region.

Out of 150 total respondents, a significant 86% expressed familiarity with EVs, and this figure rises to 95% among the younger demographic (aged 18–40), indicating that general awareness about electric vehicles is high and not a primary constraint. Despite this encouraging level of awareness, actual ownership remains very low, with only 14 individuals (9.3%) reporting that they own an EV, and just 6 among the 18–40 age group. This disparity highlights a clear gap between awareness and adoption, pointing towards underlying challenges.

Comfort ratings collected on a scale of 1 to 5 further indicate that public perception of EV usability is relatively favorable. Among the general population, a majority rated comfort between 3 and 5, with the largest group rating it at 4. Responses from the younger demographic were clustered around ratings 3 and 4, suggesting a cautious optimism toward EV comfort in comparison to conventional fuel vehicles. Very few participants rated comfort as extremely low, showing that there is minimal outright rejection based on driving experience or comfort-related concerns.

Moreover, satisfaction levels regarding the performance of EVs versus fuel vehicles showed an encouraging trend among those who have actual EV experience. Although a large portion of respondents (82 out of 150) claimed to have no direct experience with EVs, among those who did, the majority found EVs to be either "much better" or "slightly better" than fuel vehicles. This trend is mirrored in the 18–40 group, where 32 respondents rated EVs more positively than fuel vehicles, and only a minimal number felt they were worse.

The most critical insight that emerges from this data is the existence of an "experience gap." While familiarity and even favorable perceptions exist, a large proportion of respondents have never interacted with or used an electric vehicle themselves. This lack of direct experience may contribute to hesitation and slows down decision-making around purchase and adoption.
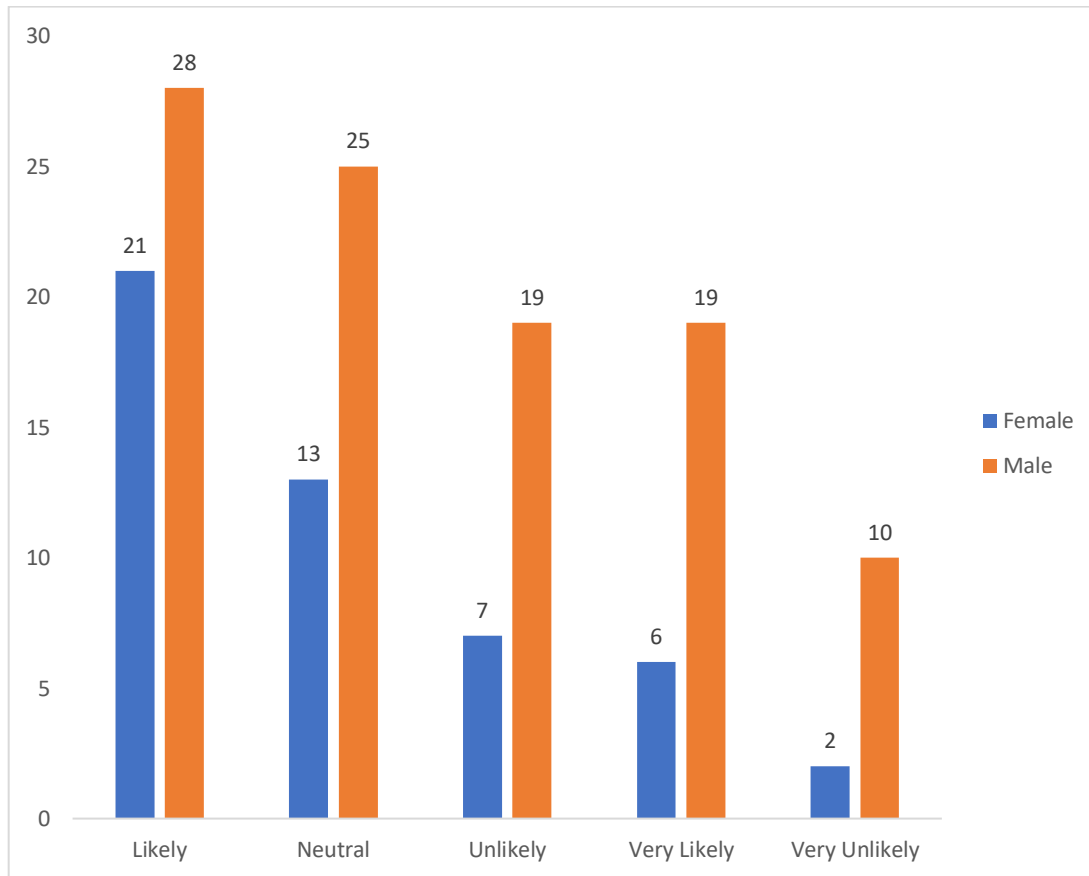
The data clearly suggests that people are not necessarily opposed to EVs, but are limited by external factors. Particularly among the youth, who are typically early adopters of technology, the positive attitude combined with low ownership signals a latent demand that has yet to be activated through effective marketing and supportive policy interventions.

Additionally, the comfort rating among both whole survey response analysis also the younger generation predominantly have given indication towards moderate satisfaction with those who have experience with Electric Vehicles, which suggestively needing to provide improvement on EVs in order have effective adoption of EVs.

In conclusion, the current landscape in Thrissur district suggests that the primary hinderances to EV adoption are not rooted in public resistance or negative sentiment, but rather in a lack of experiential access and enabling conditions that can turn curiosity and interest into actual ownership.

ANALYSIS OF

RATINGS ON APPRAOCH OF EVs

FACTORS ON ADOPTION OF EVs

MOST ASSOCIATED EV BRAND

RATE OF RECOMMENDATION OF

EVs

GRAPHICAL ANALYSIS ON RATE ON APPROACH OF BUYING ELECTRICAL VEHICLE AMONG 150 RESPONDENTS

Pivot table analysis on rate of approach on buying an EVs among 150 respondents

Based on the survey conducted among 150 responses from the population of Thrissur district, Kerala, a pivot table analysis was carried out to understand the populations intent to purchase of electric vehicles within the next years. The responses were categorized into five labels – Very Likely, Likely, Neutral, Unlikely, and Very Unlikely.

Among the 150 responses received a notable number of individuals 49 number of people responded to "likely "which shows a positive inclination towards adoption of EVs.

Meanwhile, a significant portion, 38 individuals responded to "neutral "stance suggesting indecision or the need for more information or confidence in Electric Vehicle adoption.
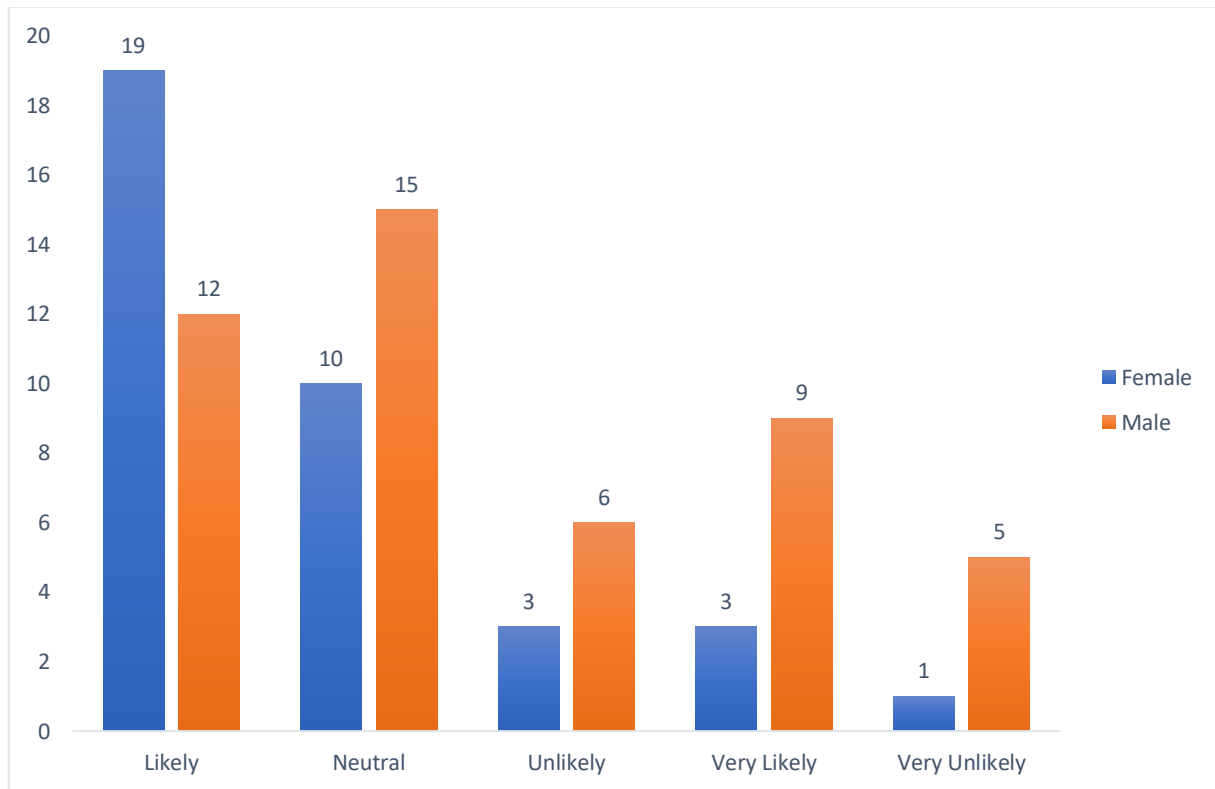
Though not higher compared with the above-mentioned rating statuses however there seem to have significant number i.e. 25 individuals chosen to respond towards "very likely "rating, reflecting smaller yet optimistic group.

On the other hand, skepticism or hesitation was evident showing 26 number of individuals showing "Unlikely "rating responses, and also 12 individuals who have shown to opt for ratings "Very Unlikely ".

This spread of responses indicates a mixed perception towards electric vehicles adoption in the near future with a leaning cautious optimism, especially among male gender community.

Further analysis is required to interpret the reasons behind neutrality and reluctance which might rooted to satisfaction skepticism, infrastructural, economic or awareness related hinderances.

GRAPHICAL ANALYSIS ON RATE ON APPROACH OF BUYING ELECTRICAL VEHICLE AMONG RESPONDENTS AGE GROUP 18 - 40

Pivot table analysis on rate of approach on buying an EVs among respondents of age group 18 - 40

In a focused analysis of the age group between eighteen and forty – considered the younger and more tech – conscious segment of the population (this demographic was selected for its closer engagement with evolving technologies and potential to drive early adoption trends) – a pivot table assessment was conducted to understand inclination towards purchasing electric vehicles within next three years and more.

Among the responses, a promising number 31 individuals expressed "Likely "interest in adopting electric vehicles, reflecting a strong openness to transition.
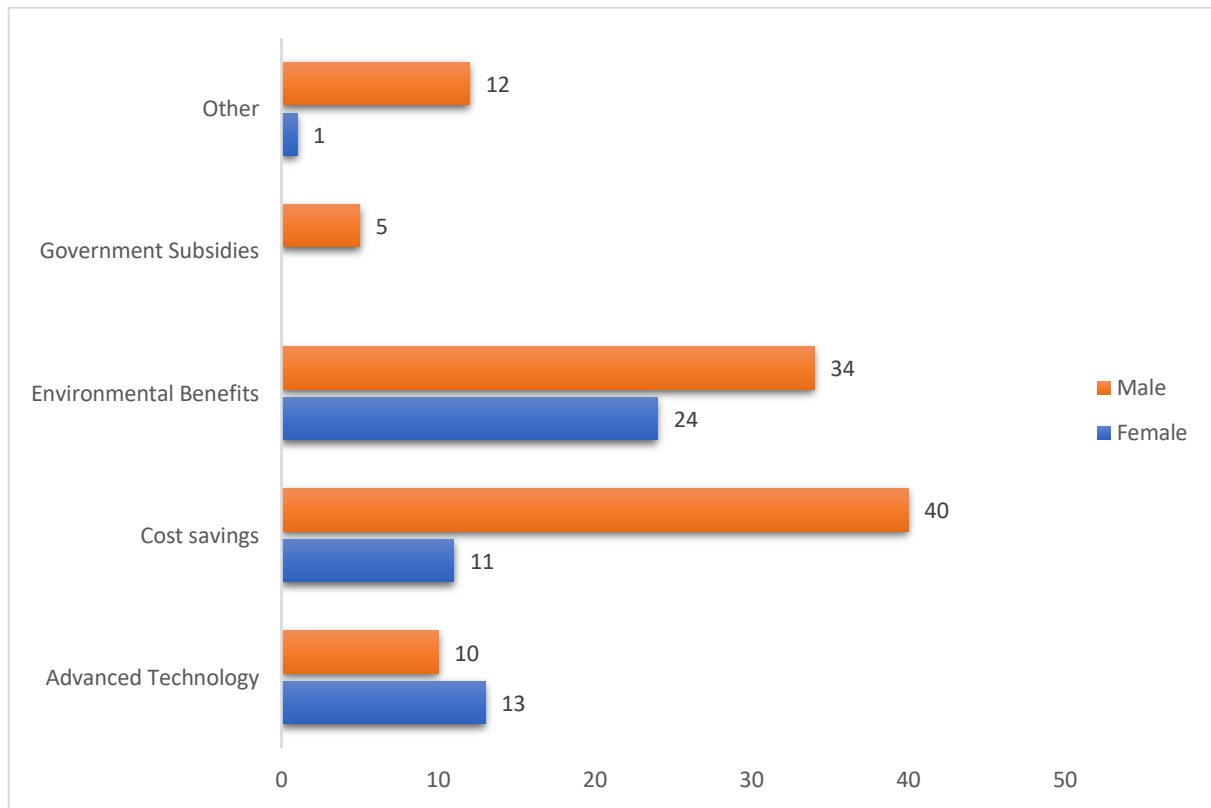
However, a substantial portion, including 25 individuals marked neutral stance, indicating a degree of uncertainty or the need for further clarity on the value and practicality of electric vehicles.

Meanwhile, showing a good number, not a significantly high to show up it to be a optimistic cluster and forward-thinking group though 12 number of individuals expressed interest in "Very Likely "rating.

Lastly a smaller group, 9 individuals responded as "Unlikely ", and 6 individuals expressed strong hesitation with a "Very Unlikely "rating.

Overall, this analysis reveals a generally positive outlook among younger generation, with a noticeable segment remaining undecided, signaling an opportunity for targeted marketing and awareness initiatives to address lingering doubts and accelerate adoption within this influential age bracket.

GRAPHICAL ANALYSIS ON FACTORS INFLUENCING FOR BUYING ELECTRICAL VEHICLE AMONG 150 RESPONDENTS

Pivot Table analysis on factors influencing on buying EVs

The analysis is aimed to identify key factors influencing the decision to purchase electric vehicles. The analysis revealed that environmental benefits emerged as the most significant motivator with 58 individuals choosing it as primary reason. This highlights a strong awareness and concern for environmental sustainability across both genders.

Following closely was cost savings chosen by 51 individuals indicating that the financial advantages of EV ownership play a substantial role, especially among male respondents.
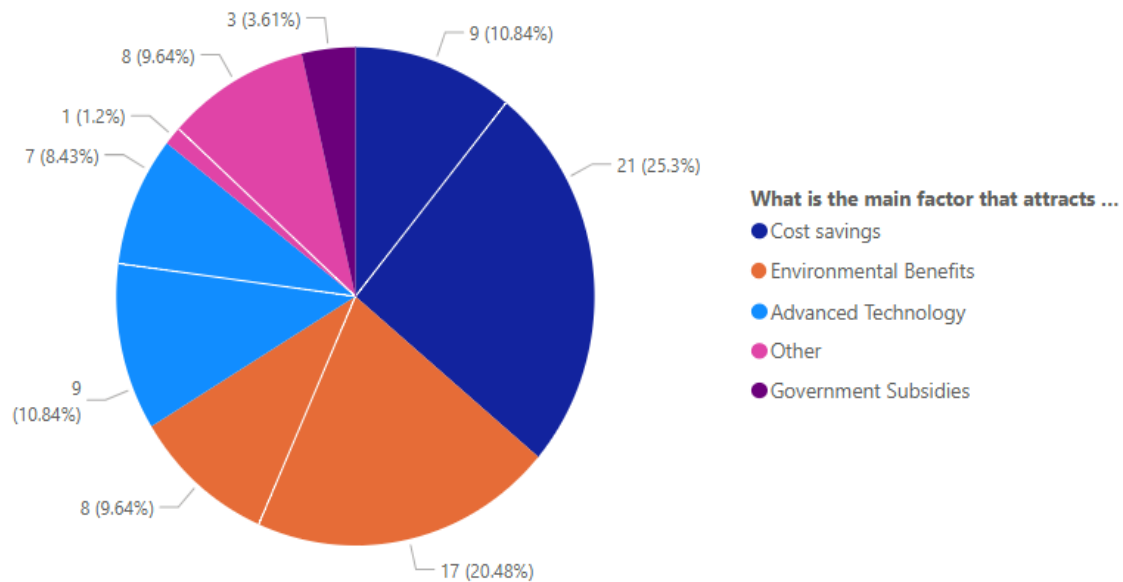
Advanced technology attracted a smaller yet notable group, with 23individuals acknowledging it as a key draw reflecting a moderate interest in innovation.

Government subsidies were less impactful, influencing only 5 individuals that too 5 male respondents, suggesting either limited awareness or insufficient appeal of current policies.

Lastly the "Other "category saw 12 individuals highlighting high number of males selecting outside the predefined options, pointing to nuanced individual preferences that may warrant further exploration.

Overall, the data suggests that environmental consciousness and cost effectiveness are the leading drivers behind EV adoption in the region, with noticeable gender variations in preference paths

GRAPHICAL ANALYSIS ON FACTORS INFLUENCING FOR BUYING ELECTRICAL VEHICLE AMONG AGE GROUP 18 – 40 RESPONDENTS

Power BI analysis on factors influencing for buying Electric Vehicles from age group 18 - 40

A power BI pie chart analysis was conducted based on survey responses collected from individuals aged eighteen to forty to understand the key factors influencing their interest in purchasing electric vehicles. This younger generation was chosen due to greater familiarity with emerging technologies and openness to innovation, making them more likely to provide critical and informed perspectives on electric mobility.

The analysis revealed that cost savings emerged as the most influential factor, with 30 (9 females and 21 males) individuals highlighting it as priority.

Environmental benefits were cited by 25 (17 females and 8 males) individuals reflecting strong ecological awareness within this age group.
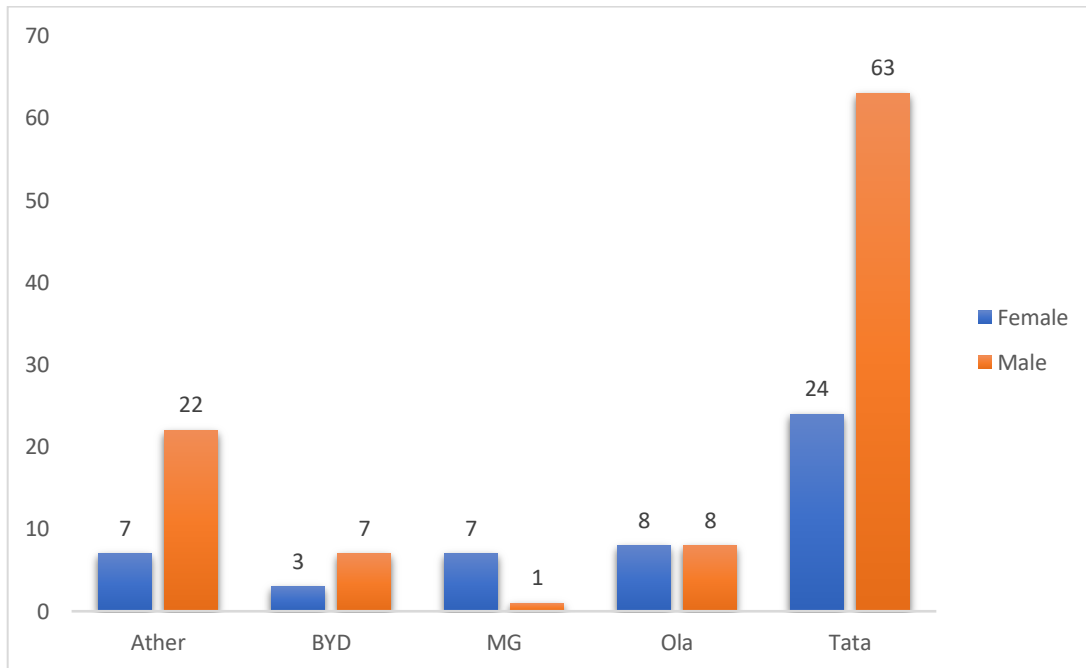
Advanced technology appealed to 16 individuals (9 Females and 7 males) suggesting moderate interest in cutting – edge features.

A smaller portion comprising 9 individuals (1 female and 8 males) pointed to other unspecified factors.

While government subsidies influenced only 3 male individuals indicating limited impact in that area.

Overall, the data emphasizes that financial and environmental considerations play the most significant roles in shaping EV adoption interest among younger generation.

GRAPHICAL ANALYSIS ON MOST ASSOCIATED AND KNOWN EV BRAND FROM AMONG 150 RESPONDENTS

Pivot table analysis on most associated EV brands among 150 respondents.

The pivot table analysis of EV brand awareness, drawn from 150 survey responses from Thrissur **district** of Kerala, reveals varied levels of familiarity across different electric vehicle brands.

TATA emerged as the most widely recognized brand, with 87 individuals indicating awareness, suggesting its strong presence and reach in that region.
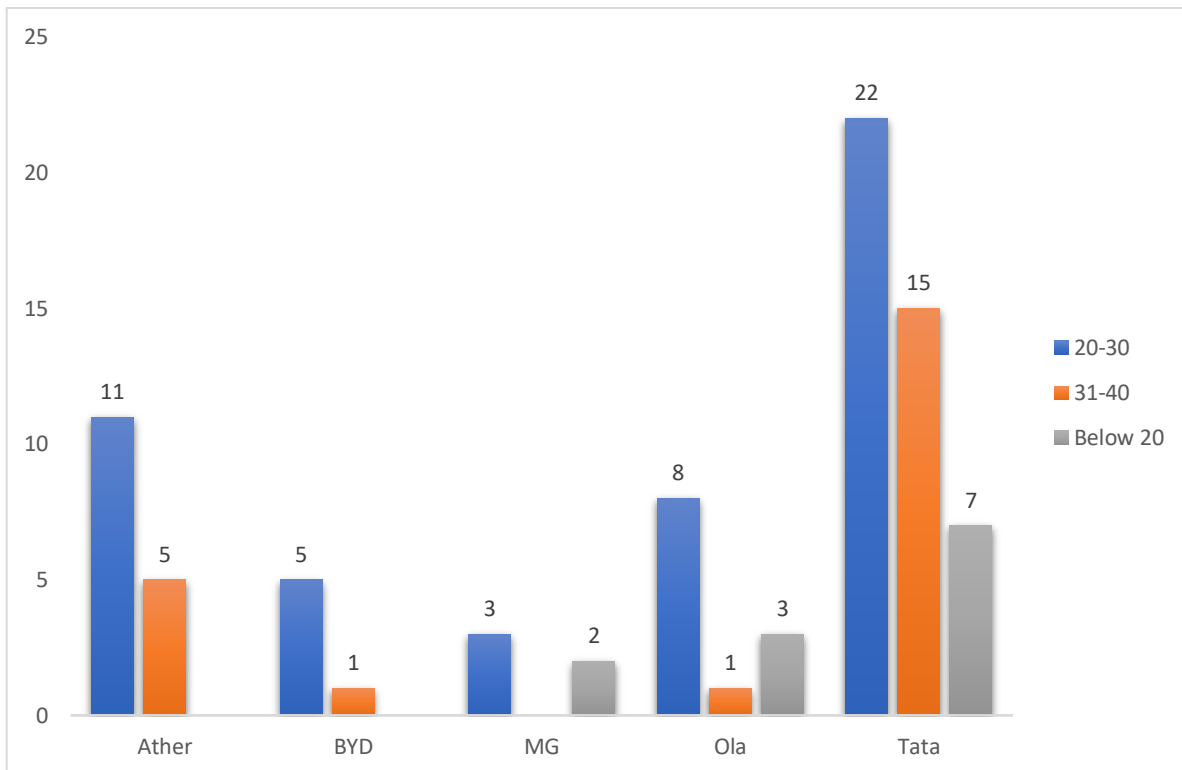
Ather followed next in recognition, 29 individuals reporting familiarity.

Interestingly, the OLA brand showed a balanced approach in giving equal number responses from each gender community which was collectively 16 individual feedback responses on the particular choice brand.

MG on the other hand demonstrated a gender skewed awareness, being known primarily among females with 7 female and one male response acknowledging familiarity.

This data indicates that while certain brands like TATA have achieved significant penetration and recall among local population others still face challenges in brand visibility and public familiarity.

GRAPHICAL ANALYSIS ON MOST ASSOCIATED AND KNOWN EV BRAND FROM AMONG AGE GROUP 18 – 40 RESPONDENTS

Pivot Table analysis for most associated and known EV brands among age group 18 - 40

The graphical and pivot table analysis of the survey responses collected from Thrissur district, Kerala, specifically focusing on the age group of 18 to 40 years, provides valuable insights into the level of brand awareness and association with electric vehicle (EV) manufacturers among the younger population. This demographic is widely regarded as being more receptive to technological advancements and plays a critical role in the adoption of evolving innovations such as electric mobility.

The analysis reveals that TATA Motors holds a dominant position in terms of brand recognition, with 44 respondents associating with the brand.
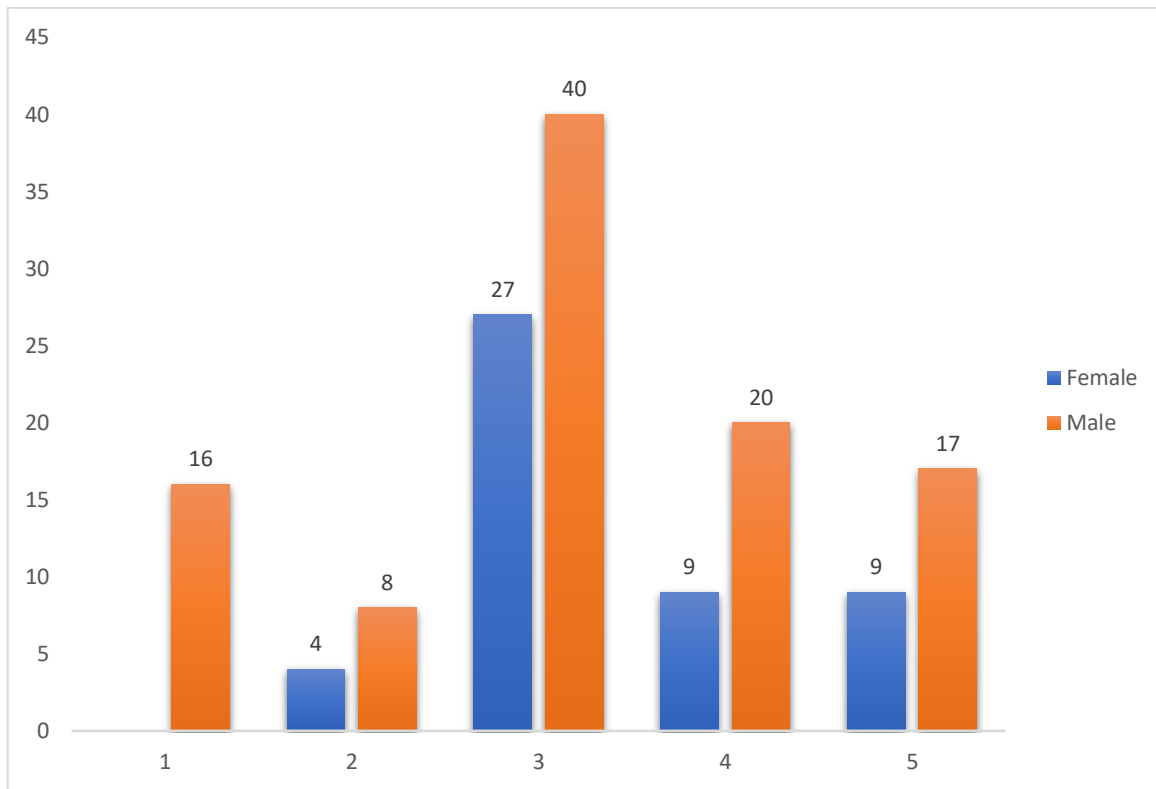
Ather Energy follows with moderate awareness, reported by 16 individuals.

BYD and MG show relatively limited brand recognition within this demographic.

While OLA Electric exhibits a growing presence, particularly among the younger segment, with 12 respondents.

The data clearly indicates that brand familiarity is closely tied to the intensity of marketing efforts and the presence of these brands in the local market. **The strong performance of TATA, in particular, reflects both its strategic positioning and effective outreach in promoting electric vehicles to the younger, more tech-savvy generation in the region.**

GRAPHICAL ANALYSIS ON REOMMENDATION OF EV BRAND TO PEOPLE KNOWN FROM AMONG 150 RESPONDENTS

Pivot Table analysis for EV recommendation ratings to other people by respondents

A PivotTable-based bar graph analysis was conducted to assess the likelihood of individuals recommending electric vehicles (EVs) to their friends, family, and acquaintances. The survey gathered responses from 150 participants residing in the Thrissur district of Kerala, as part of a broader study on the hindrances affecting the adoption and marketing of electric vehicles. Respondents were asked to rate their willingness to recommend EVs on a five-point scale, where 1 indicated very low or no recommendation and 5 represented a strong recommendation.

The analysis revealed a wide range of perspectives. A total of 16 male respondents rated their recommendation as 1, reflecting a strong reluctance to endorse EVs.

At the second level, 4 females and 8 males expressed limited support by assigning a rating of 2.
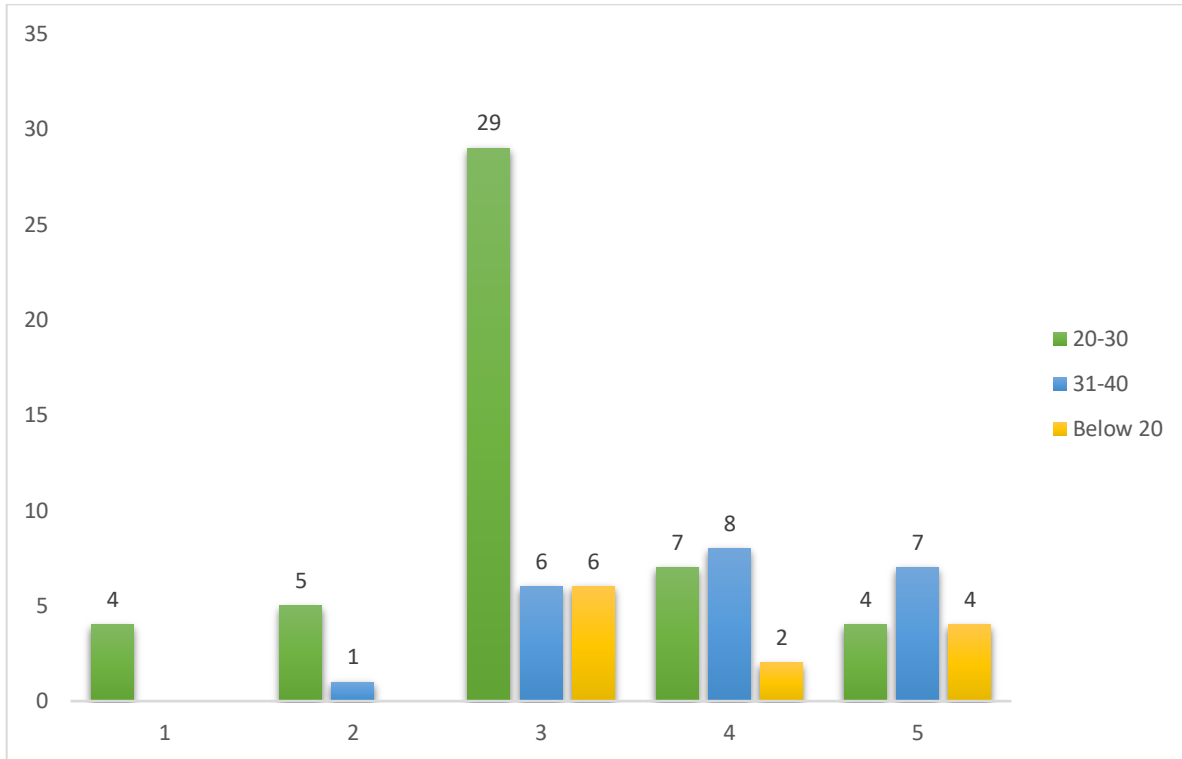
The most prominent response was a neutral rating of 3, chosen by 27 females and 40 males, suggesting that a substantial portion of the respondents remain undecided or moderately supportive.

A more positive outlook was reflected in the responses of 9 females and 20 males who rated their recommendation level as 4.

Lastly, 9 females and 17 males offered the highest rating of 5, indicating strong advocacy for electric vehicles.

Overall, while neutral opinions dominate the dataset, a gradual increase in positive ratings suggests an emerging openness toward EV endorsement among the population, although certain hesitations remain that may be rooted in practical, infrastructural, or perceptual barriers

GRAPHICAL ANALYSIS ON REOMMENDATION OF EV BRAND TO PEOPLE KNOWN FROM AMONG AGE GROUP 18 – 40 RESPONDENTS

Pivot Table analysis for EV recommendation ratings to other people by respondents among age group 18 - 40

A focused PivotTable and bar graph analysis was carried out to assess the likelihood of individuals aged eighteen to forty recommending electric vehicles (EVs) to others, including friends, family, colleagues, and acquaintances. This age group was chosen for its alignment with evolving technological awareness and openness to innovation. It is assumed that individuals within this bracket are better equipped to offer constructive feedback and informed perspectives on emerging mobility trends, compared to older populations who may prioritize conventional comfort and familiarity with fuel-based vehicles.

Respondents were asked to rate their likelihood of recommending an EV on a scale from one to five, with one indicating low or no recommendation and five representing a strong recommendation.

Within the age group of eighteen to forty-four individuals assigned a rating of one,

While seven individuals from the same group, selected rating two.

Rating three, indicating a neutral or moderately supportive stance, was the most common and included thirty-one individuals.

For rating four, seventeen individuals expressed a stronger inclination to recommend EVs.

The highest rating of fifteen was assigned by four individuals, signaling strong advocacy among some respondents across all younger sub-groups.

Overall, the analysis reflects a cautious yet growing positivity toward EV adoption among the youth, with rating three being the most frequent choice. The gradual increase in higher ratings suggests a shift toward favorable perceptions, especially among those in their thirties. These insights underline the importance of targeting the younger demographic when promoting EVs, as they not only exhibit openness but also demonstrate potential to influence broader societal adoption through peer recommendation.

INTERIM INSIGHTS AND PRELIMINARY DEDUCTIONS OF THE ANALYSIS

Based on the insights from the survey responses collected from 150 individuals in Thrissur district, the adoption and marketing of electric vehicles (EVs) reveal a mix of encouraging perceptions and significant challenges. A high level of familiarity with EVs was noted across all respondents, particularly among the age group 18 to 40, indicating general awareness and openness to the concept. However, this familiarity does not translate to ownership, as the rate of EV ownership remains notably low in both the general and younger demographic, highlighting a clear gap between awareness and actual adoption.

Comfort satisfaction ratings for EVs compared to fuel vehicles showed moderate approval, with respondents giving a higher rating for fuel vehicles, yet still displaying favorable views toward EV comfort. The feedback on the experience of EVs was largely shaped by a lack of hands-on experience, with many indicating no prior interaction with EVs. For those who did experience EVs, most reported positive feedback, indicating that real-world exposure may significantly influence future adoption.
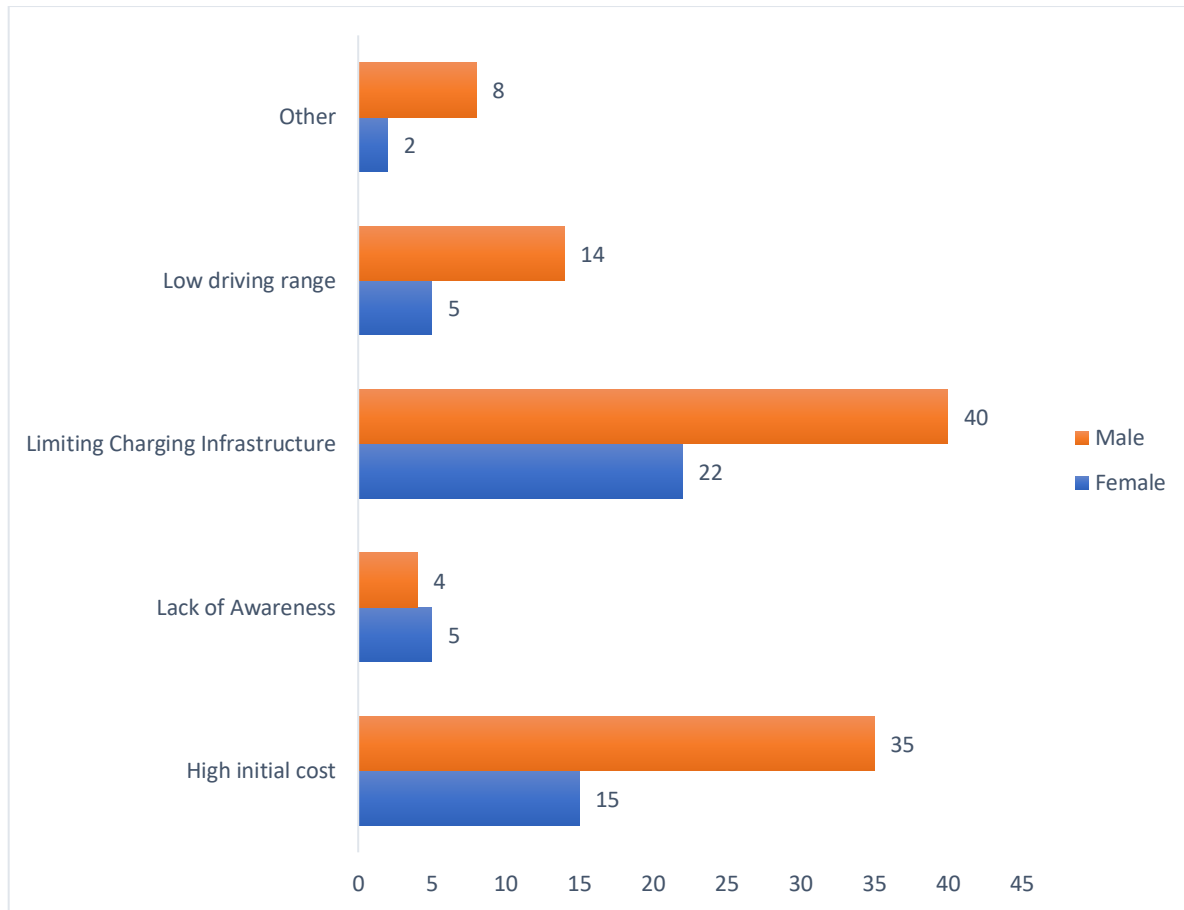
When it comes to the likelihood of purchasing an EV, the majority of respondents, including those from the younger demographic, expressed a neutral or likely stance, suggesting a cautious yet optimistic view of EV ownership. The factors influencing the decision to purchase an EV were dominated by cost savings and environmental benefits, with the younger age group prioritizing cost benefits, further emphasizing the need for affordable solutions as a primary barrier to adoption.

In terms of EV brand recognition, Tata was the most recognized and favored brand among respondents, including the younger demographic, followed by Ather and BYD, although recognition of other brands was relatively low. The recommendation of EV brands to friends, family, and colleagues similarly reflected a neutral to positive sentiment, with most respondents offering a moderate recommendation.

Overall, these findings suggest that while there is a strong awareness and interest in electric vehicles, key barriers such as cost, experience, and brand recognition still limit widespread adoption. The younger generation, in particular, appears to be more critical and discerning of technological advancements and cost-effective solutions, which could play a pivotal role in shaping future trends in the EV market. Further analysis and insights will be needed to refine these findings and provide a clearer understanding of the factors that can drive greater EV adoption in the region.

ANALYSIS OF

BARRIERS ON EV ADOPTION

CHARGING STATION

AVAILABILITY

BATTERY REPLACEMENT

CHARGES

MAINTAINENCE AVAILABILITY

GRAPHICAL ANALYSIS BARRIERS ON BUYING EVs FROM AMONG 150 RESPONDENTS

Pivot Table analysis on barriers on buying EVs among 150 respondents

The analysis of barriers to purchasing electric vehicles (EVs) based on 150 responses from the Thrissur district population has provided valuable insights into the factors influencing adoption.

Among the various barriers surveyed, the most significant deterrent identified was the high initial cost, which was selected by 50 individuals.
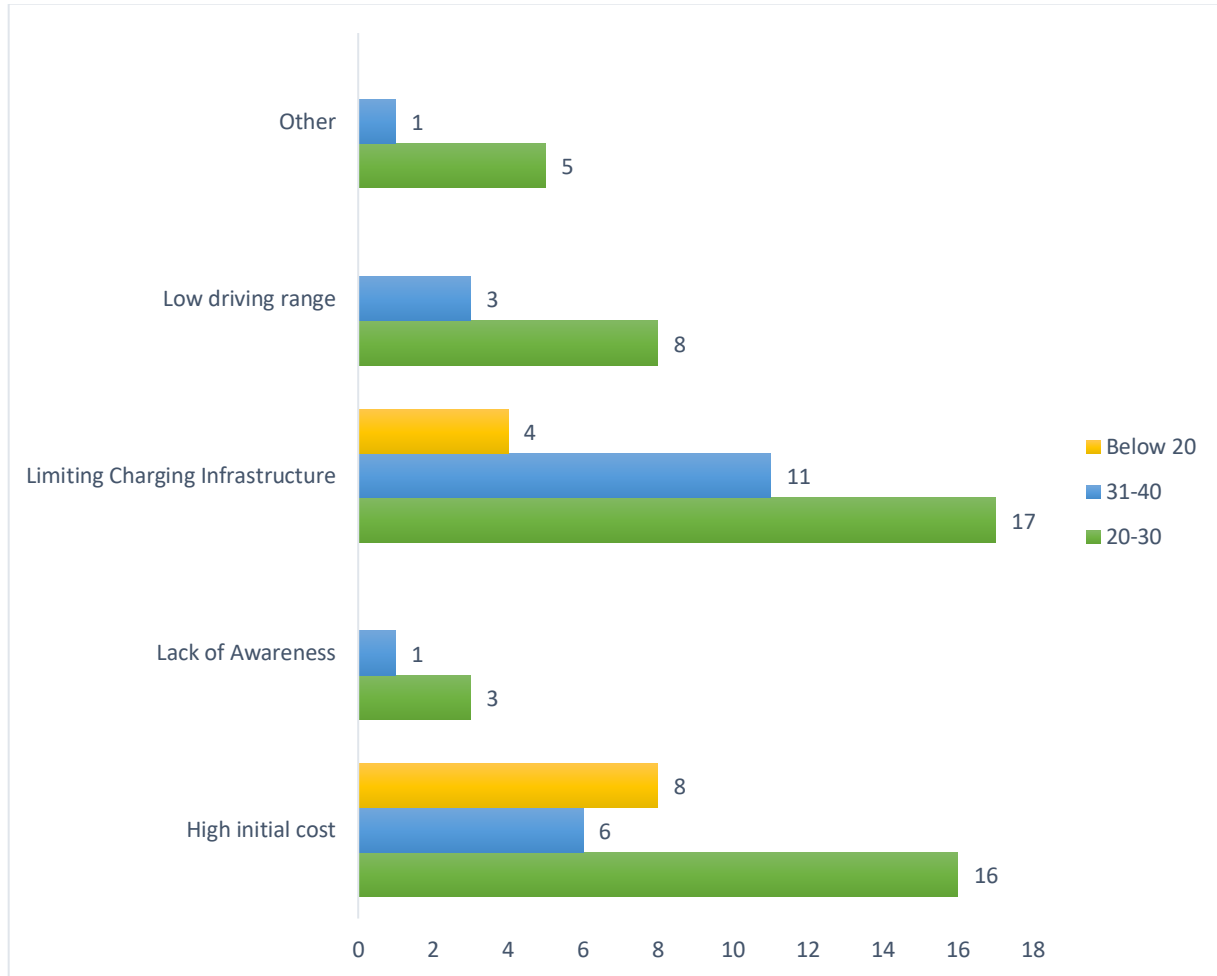
This was followed by the limiting charging infrastructure, chosen by 62 individuals, highlighting concerns about the availability of adequate charging facilities.

The barrier of low driving range was reported by 8 individuals, while lack of awareness was selected by a smaller proportion, with 9 individuals opting for this choice.

Additionally, other factors were noted by 10 individuals, although this category represented a minor concern compared to the others.

The graphical and pivot table analysis clearly demonstrates that the high initial cost and the limitations in charging infrastructure are the most pressing barriers to EV adoption, especially among the male respondents. This insight serves as a foundation for understanding the challenges hindering the widespread acceptance of electric vehicles in the region.

GRAPHICAL ANALYSIS BARRIERS ON BUYING EVs FROM AMONG AGE GROUP 18 - 40 RESPONDENTS

Pivot Table analysis on barriers on buying EVs among age group 18 - 40 respondents

The analysis of barriers to purchasing electric vehicles (EVs) among the younger generation (ages 18 to 40) provides critical insights into the challenges they face when considering EV adoption. This demographic, being more attuned to evolving technologies, offers valuable perspectives on the barriers that may hinder the widespread acceptance of EVs. The survey results, which categorized responses into three age groups—below 20, 20 to 30, and 31 to 40—highlight significant trends in the factors limiting EV adoption.

The high initial cost emerged as a prominent barrier, 30 individuals group selecting this option. This suggests that while the cost is a concern across all age groups, the younger generation (20 to 30 years) is particularly sensitive to the upfront financial commitment of EVs.

In terms of lack of awareness, the responses were less frequent, with 4 individuals from the younger age group opting for this barrier. This indicates that while awareness may not be a widespread issue among the younger generation, there is still a gap in understanding about EVs, particularly among the older segment of this age group.
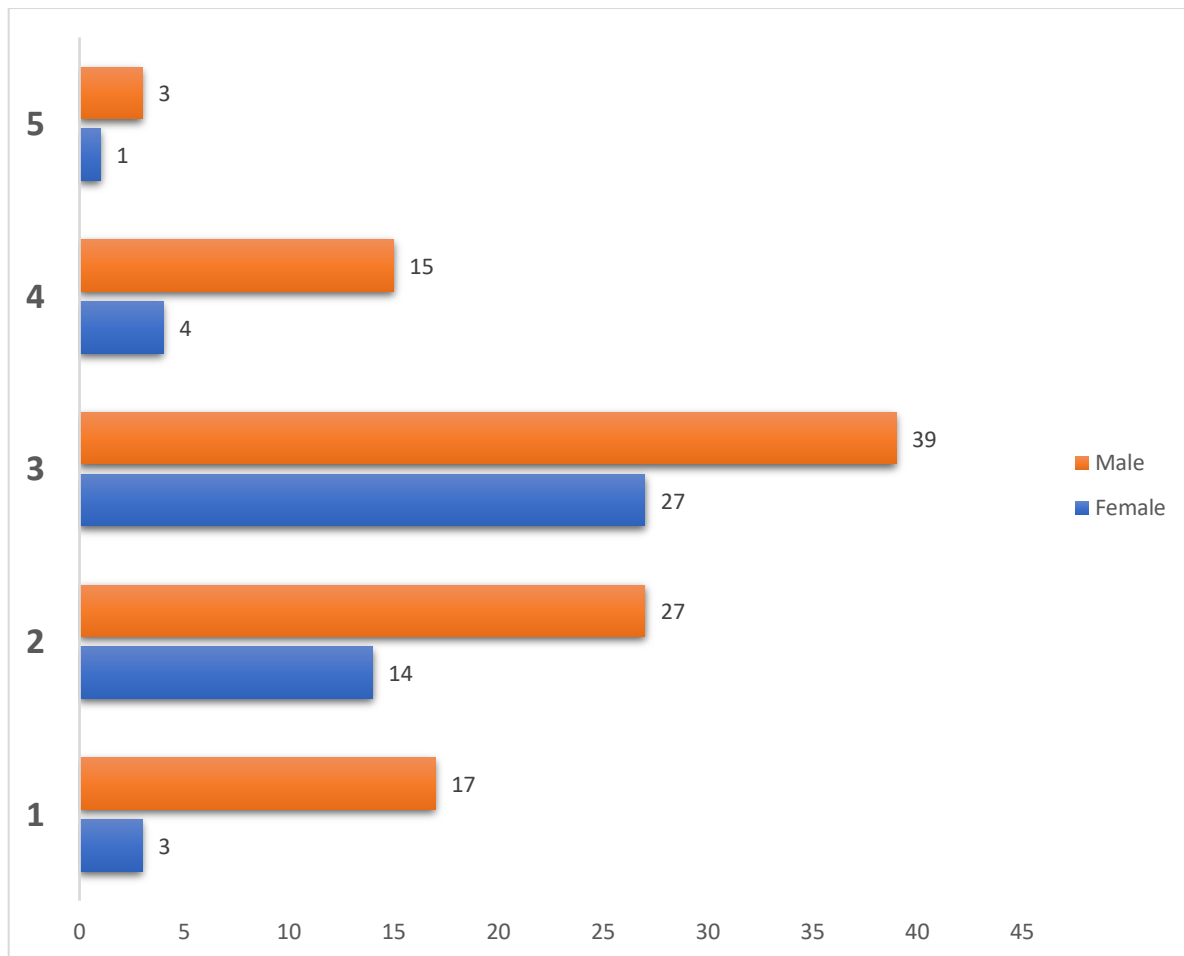
The issue of limiting charging infrastructure was a major concern for the younger generation, with 32 individuals age group citing it as a significant barrier. This highlights the importance of expanding charging networks to cater to the demands of a tech-savvy, younger demographic that is keen on embracing electric mobility.

When considering low driving range, this factor was cited by 11 individuals from the younger age group, further emphasizing the importance of vehicle performance in the adoption decision.

Lastly, the other barriers category was less frequently cited, with six individuals from the younger group mentioning alternative concerns.

This analysis provides a detailed understanding of the barriers to EV adoption from a younger, technology-conscious demographic, emphasizing the need for affordable pricing, availability of charging infrastructure, to drive the future of electric mobility.

GRAPHICAL ANALYSIS AVAILABILITY OF CHARGING STATIONS FROM AMONG 150 RESPONDENTS

Pivot Table analysis on availability of charging stations EVs among 150 respondents

The analysis of the accessibility and satisfaction levels of charging stations for electric vehicles (EVs) in the Thrissur district, Kerala, was based on survey responses from 150 individuals. Respondents were asked to rate their satisfaction with the availability and accessibility of EV charging stations on a scale from 1 to 5, where 1 indicated very low satisfaction or accessibility, and 5 signified high accessibility and satisfaction.

The data reveals that 21 individuals rated the accessibility as 1, indicating very low satisfaction or accessibility.

Similarly, 41 individuals rated the accessibility as 2, highlighting a significant portion of the population experiencing limited accessibility to EV charging stations.
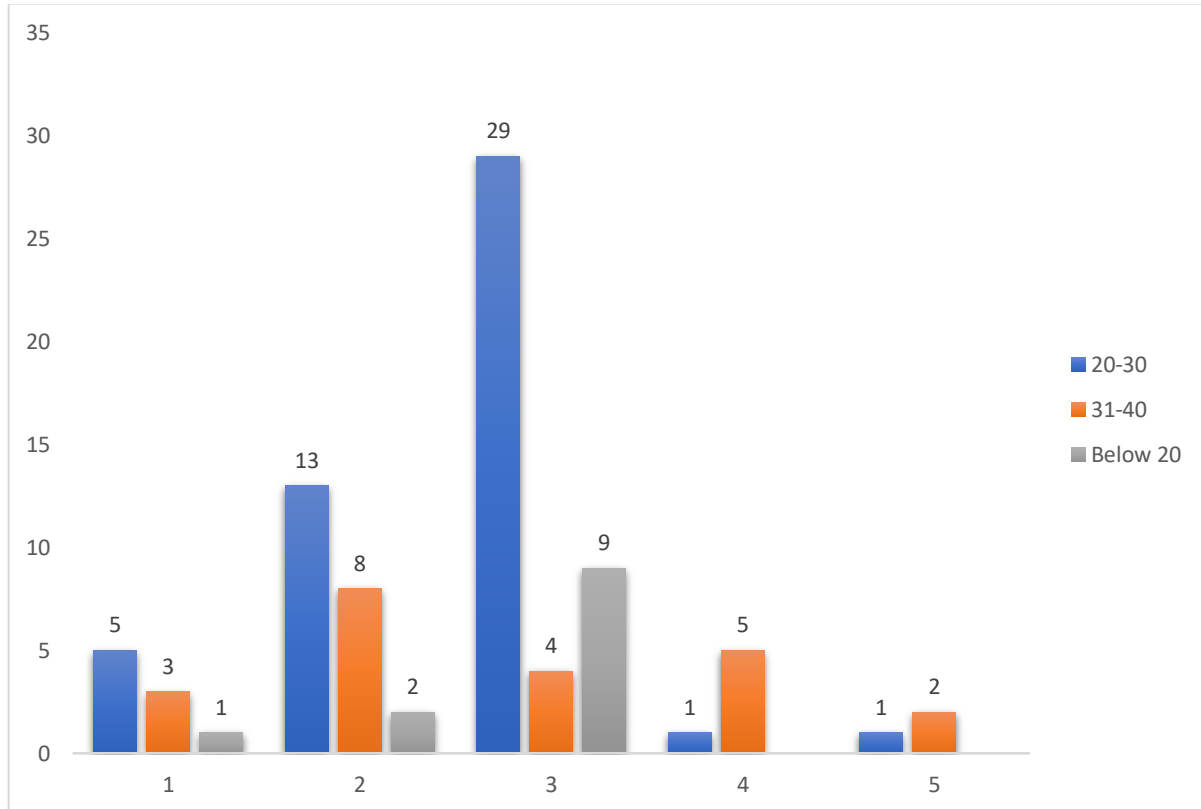
The 3 rating was the most commonly selected, with 66 individuals, which suggests that a considerable number of respondents feel moderately satisfied with the current charging infrastructure.

The 4 rating was provided by 19 individuals, indicating that a smaller group of respondents were somewhat satisfied with the availability and accessibility of charging stations.

Only a few respondents, 4 individuals, rated the accessibility as 5, reflecting that high satisfaction and accessibility of charging stations are still relatively rare in the region.

This distribution of ratings underscores a noticeable gap in the satisfaction levels concerning the accessibility of EV charging infrastructure. **While many respondents express moderate satisfaction, a significant proportion still experiences limited access or dissatisfaction, which points to the need for greater investment and expansion of charging networks to enhance EV adoption in Thrissur.**

GRAPHICAL ANALYSIS AVAILABILITY OF CHARGING STATIONS FROM AMONG AGE GROUP 18 - 40 RESPONDENTS

Pivot Table analysis on availability of charging stations EVs among age group 18 - 40 respondents

The analysis of the accessibility, availability, and satisfaction with EV charging stations in the Thrissur district, Kerala, was further categorized by the age group 18 to 40, recognizing that younger generations are more immersed in the evolving tech landscape and are more likely to provide constructive feedback and insights regarding emerging technologies. This group's perspectives are crucial in understanding the barriers and opportunities for EV adoption, especially given their increased exposure to and interaction with technological advancements.

Survey respondents from this age group were asked to rate their satisfaction and the accessibility of charging stations on a scale from 1 to 5, where 1 represented low satisfaction or accessibility, and 5 denoted high satisfaction or accessibility. The ratings given by the respondents from the age group 18 to 40 were as follows:

A rating of 1 was provided by 9 individuals from the younger age group, indicating a notable dissatisfaction or limited accessibility to charging stations among these age groups.

For the rating of 23 individuals from the younger age group expressed limited satisfaction or accessibility, which suggests a significant portion of the younger demographic perceives challenges in accessing EV charging infrastructure.
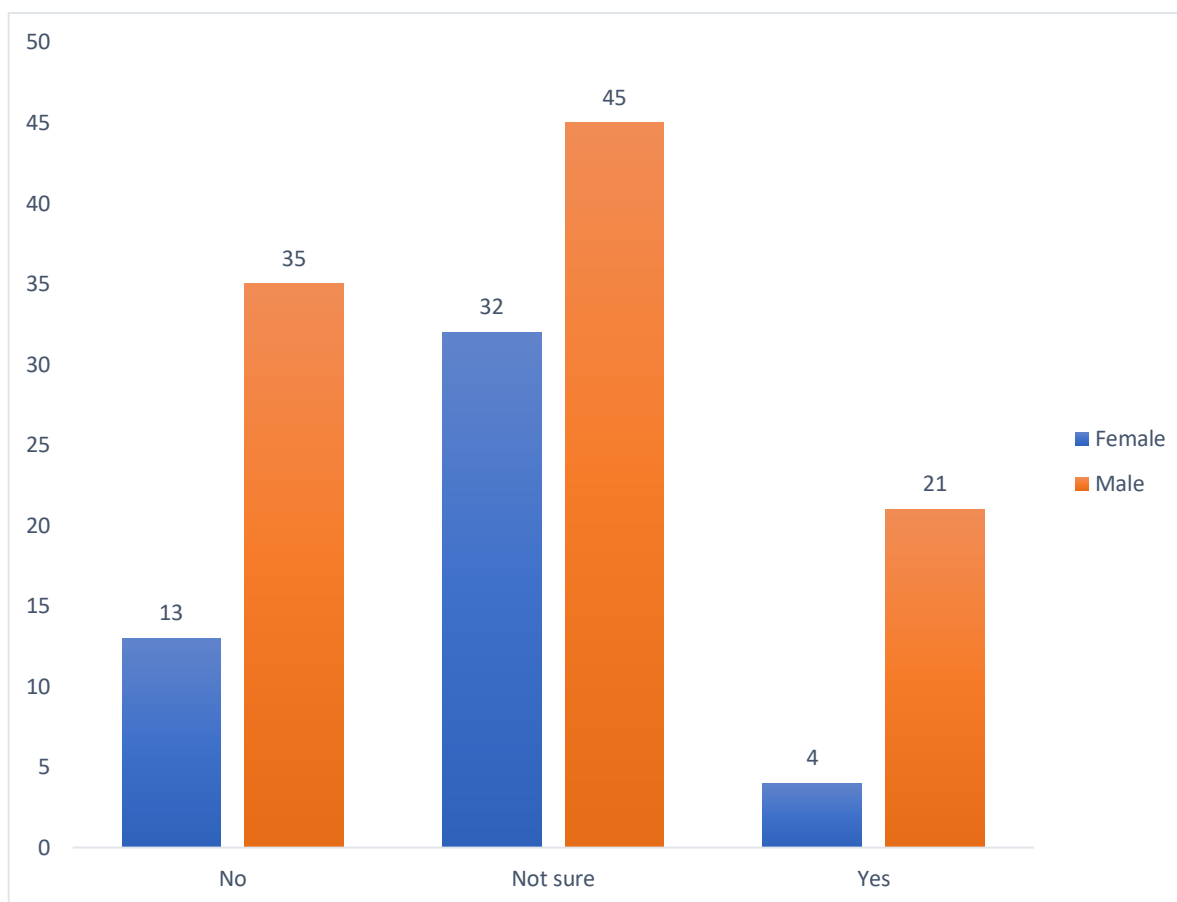
The rating of 3 was the most commonly selected, with 42 individuals from the younger age group providing this rating, suggesting moderate satisfaction with the charging infrastructure.

A rating of 4 was given by 6 individuals from the younger age group, reflecting that some respondents feel relatively satisfied with the charging stations available to them.

Lastly, a rating of 5, indicating high satisfaction, was provided by 3 individuals from the younger age group, pointing to a smaller group of respondents who are highly satisfied with the availability and accessibility of charging infrastructure.

This analysis highlights that while the younger age group generally expresses moderate satisfaction with the current EV charging infrastructure, there is still a noticeable gap in accessibility and satisfaction, with many respondents rating the infrastructure as less than adequate. The insights from this demographic are crucial for identifying areas of improvement in the EV charging network, which could significantly enhance the adoption and growth of electric vehicles in the region.

GRAPHICAL ANALYSIS AVAILABILITY OF REPAIR SERVICES FOR EVS IN THRISSUR DISTRICT OF KERALA FROM AMONG 150 RESPONDENTS
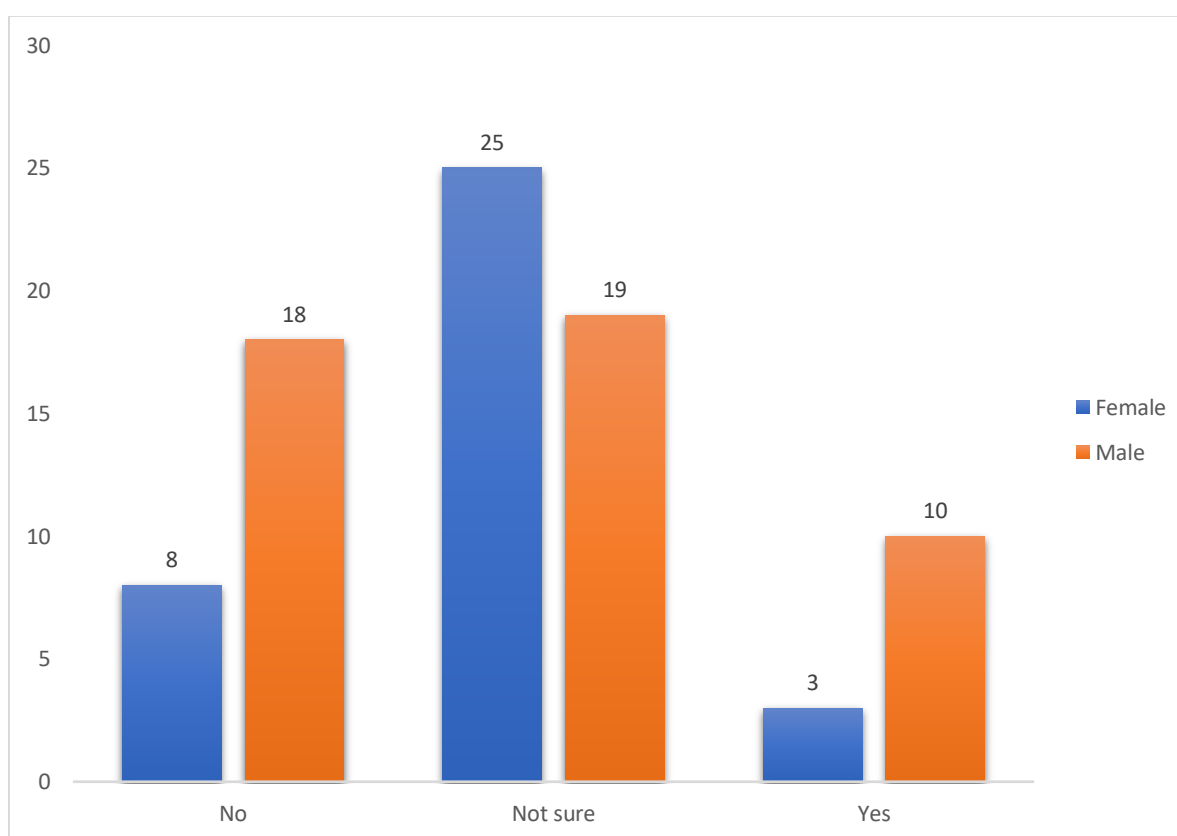

**Pivot Table analysis of repair services for EVs in Thrissur district
of Kerala from 150 respondents**

This pivot table bar graph provides a gender-wise representation of public perceptions regarding the accessibility of electric vehicle (EV) repair stations in the Thrissur district of Kerala. The analysis is based on survey responses collected from 150 individuals as part of a broader study on the learning hindrances affecting the adoption and marketing of EVs in the region. Participants were asked whether they believed EV repair stations were accessible, with responses categorized as Yes, No, or Not Sure.

According to the data, only a small segment—3 females and 10 males—responded affirmatively. A larger group, comprising 13 females and 35 males, expressed the view that such repair facilities are not accessible. The highest number of respondents, including 32 females and 45 males, indicated uncertainty. This distribution reflects a substantial gap in awareness and availability of EV support infrastructure, underlining a key barrier to the successful adoption and promotion of electric vehicles in the Thrissur district.

GRAPHICAL ANALYSIS AVAILABILITY OF REPAIR SERVICES FOR EVS IN THRISSUR DISTRICT OF KERALA FROM AMONG AGE GROUP 18 - 40 RESPONDENTS
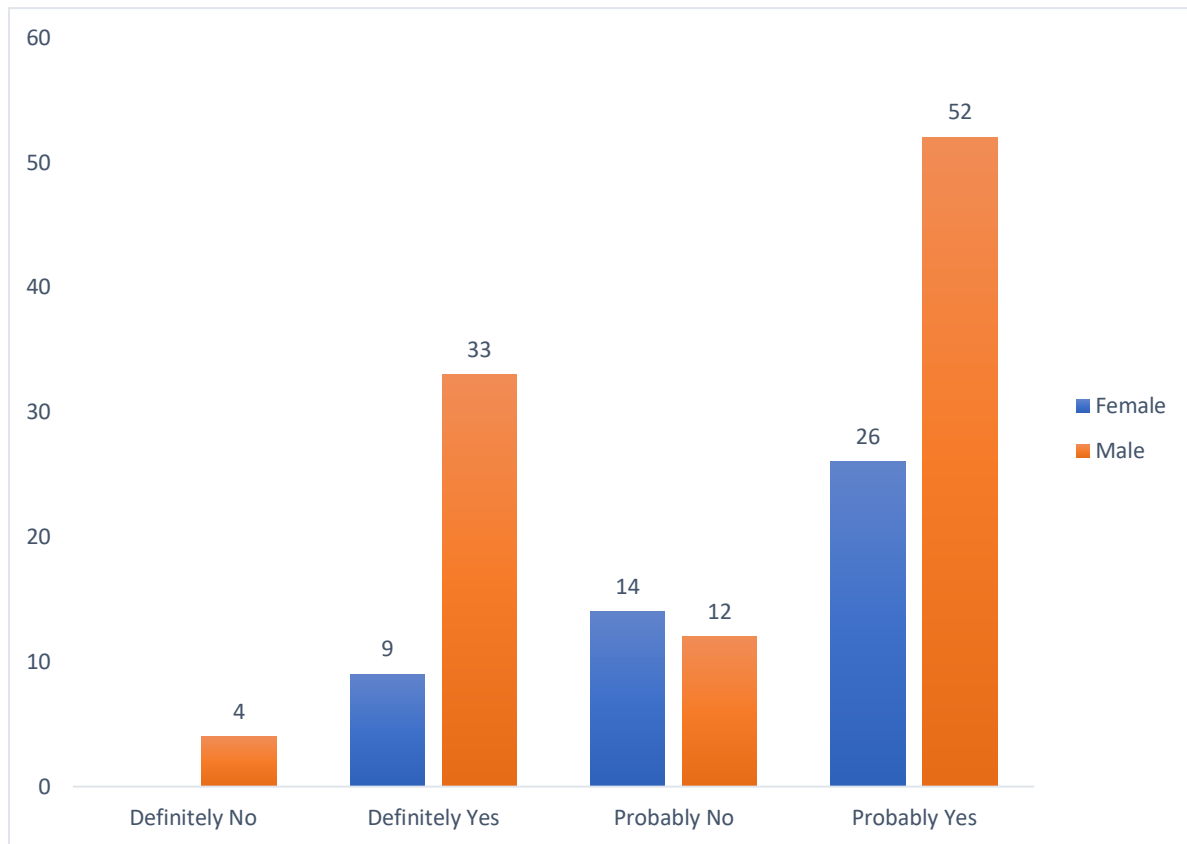

Pivot Table analysis of repair services for EVs in Thrissur district of Kerala from 18 – 40 age group respondents

This pivot table bar graph presents a gender-based analysis of responses concerning the accessibility of electric vehicle (EV) repair stations in the Thrissur district of Kerala. The data is derived from a survey conducted among 150 individuals aged 18 to 40, a demographic intentionally selected due to their increased exposure to evolving technologies and their potential to offer more critical insights into technological advancements and infrastructure needs. The survey forms part of a broader study exploring the learning hindrances in the adoption and marketing of EVs within the region.

Respondents were asked whether they believed EV repair stations are accessible, with their answers categorized as Yes, No, or Not Sure. Among the 150 participants, 3 females and 10 males responded "Yes," suggesting limited confidence in the availability of such facilities. Meanwhile, 8 females and 18 males responded "No," indicating a noticeable perception of inadequate infrastructure. A substantial number—25 females and 19 males—chose "Not Sure," reflecting a high level of uncertainty or lack of awareness about available repair options.

This graphical analysis underscores a significant challenge in EV adoption: the perceived or actual lack of repair infrastructure, especially among younger, tech-aware individuals. The findings highlight the urgent need for improved visibility, accessibility, and communication regarding EV support systems to foster greater consumer confidence and market penetration in the Thrissur district.

GRAPHICAL ANALYSIS ON RESPONSES OVER POSSIBILITY ON DISCORAGEMENT ON ADOPTION EVs DUE TO BATEERY REPLACEMENT COSTS FROM AMONG AGE 150 RESPONDENTS

Pivot Table analysis on possibility of discouragement on adoption of EVs due to battery replacement costs among 150 respondents

This pivot table bar graph illustrates a gender-wise analysis of the discouragement associated with electric vehicle (EV) adoption due to battery replacement costs in the Thrissur district of Kerala. The analysis is derived from a structured survey involving 150 respondents, conducted as part of a broader study on the learning hindrances affecting the adoption and marketing of EVs in the region.

Participants were asked whether battery replacement costs act as a discouraging factor in choosing EVs, with their responses categorized into four options: Definitely Yes, Probably Yes, Probably No, and Definitely No. Among the respondents, a significant number—9 females and 33 males—selected "Definitely Yes," expressing strong concern about battery-related expenses. The largest portion of participants, comprising 26 females and 52 males, chose "Probably Yes," indicating moderate but notable apprehension. Meanwhile, 14 females and 12 males responded with "Probably No," and only a minimal number—4 males and no females—opted for "Definitely No," suggesting limited disagreement.

This graphical representation clearly highlights battery replacement cost as a major perceived obstacle in the adoption of EVs, particularly among male respondents. The results point to a need for targeted policy measures, such as improved battery warranties, cost transparency, and subsidy frameworks, to address this barrier and enhance consumer confidence in the long-term affordability of electric vehicles within the Thrissur district.

GRAPHICAL ANALYSIS ON RESPONSES OVER POSSIBILITY ON DISCORAGEMENT ON ADOPTION EVs DUE TO BATEERY REPLACEMENT COSTS FROM AMONG AGE GROUP 18 - 40 RESPONDENTS
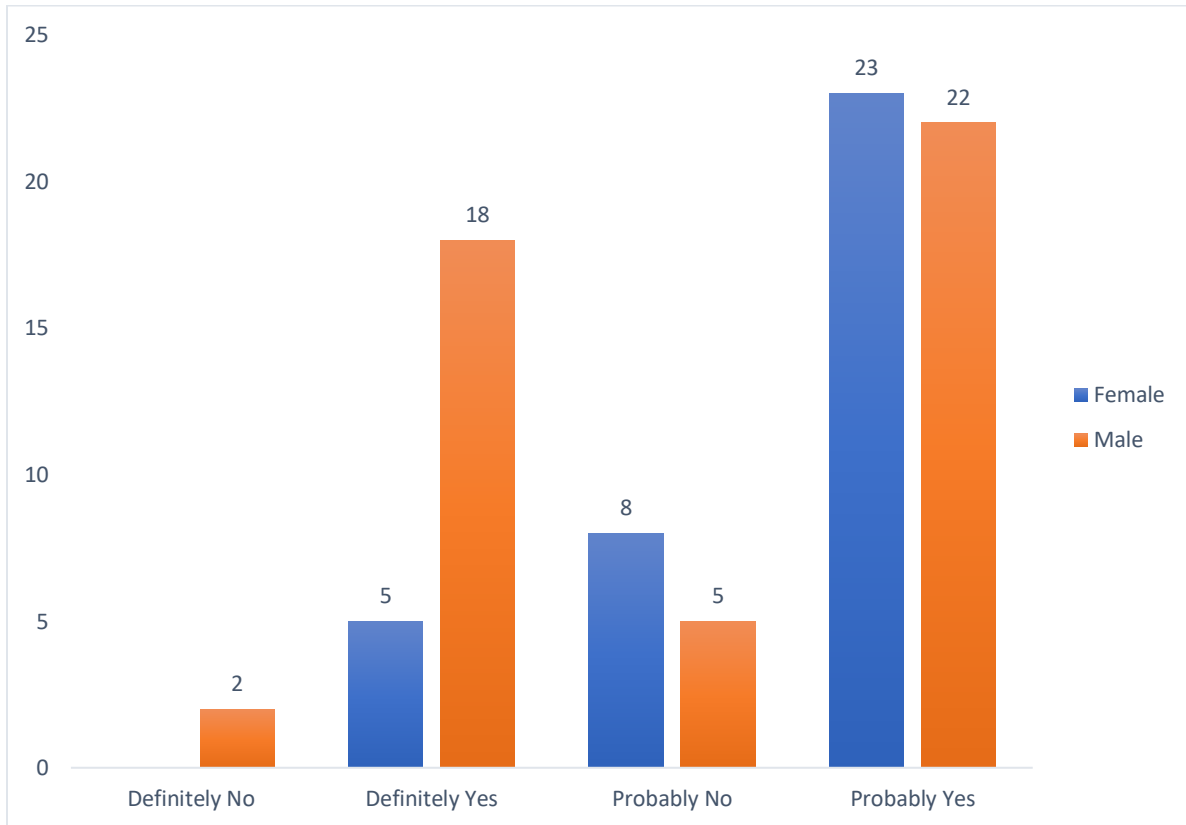

Pivot Table analysis on possibility of discouragement on adoption of EVs due to battery replacement costs among age group 18 – 40 respondents

This pivot table bar graph presents a gender-wise analysis of the perceived discouragement of the data from responses from 150 individuals yet from them particularly categorized age group within the age group of 18–40, chosen specifically for their greater exposure to emerging technologies and their ability to critically evaluate the evolving needs of the EV ecosystem.

The survey responses for the analysis done on to understand the possibility of discouragement on adoption of EVs were categorized into four options: Definitely Yes, Probably Yes, Probably No, and Definitely No, in response to whether battery replacement costs discourage the adoption of EVs. A notable portion of respondents—5 females and 18 males—selected "Definitely Yes," indicating strong concern over battery costs. The majority leaned toward moderate agreement, with 23 females and 22 males choosing "Probably Yes." In contrast, a smaller segment—8 females and 5 males—responded with "Probably No," and only 2 males (with no female respondents) selected "Definitely No," showing minimal disagreement.

This graphical analysis reveals that battery replacement costs are widely perceived as a significant barrier to EV adoption, particularly among the younger population who are otherwise considered early adopters of technology. The findings emphasize the need for increased awareness around battery warranties, technological advancements in battery life, and financial incentives or subsidies to address this critical concern and accelerate the transition to electric mobility in the district

PRELIMINARY ANALYSIS STATEMENT

The preliminary findings from the survey conducted among 150 respondents in Thrissur district offer significant insights into the current awareness, perception, and attitude towards electric vehicles (EVs), especially when segmented demographically by gender and age group—particularly focusing on the younger generation comprising Gen Z and Millennials (ages 18–40), who are more attuned to emerging technologies and sustainable alternatives. The analysis reveals a high level of familiarity with EVs among the general population, with a notable gender gap favoring male respondents. Interestingly, within the 18–40 age group, although familiarity appears relatively widespread, a small fraction still reported unfamiliarity, indicating a potential gap in outreach or engagement strategies.

Ownership levels of EVs remain low across all segments, underscoring that while awareness exists, adoption is yet to follow suit at a similar pace. Younger respondents, though relatively more open, also show a low ownership rate, reinforcing barriers that hinder conversion from interest to actual purchase.

Comfort ratings for EVs compared to conventional fuel vehicles cluster largely around neutral to positive scores, especially within the younger age groups, indicating a gradual shift in perception. This trend is also echoed in comparative experience ratings, where a majority of younger participants perceived EVs as either better or at least comparable to traditional vehicles, though a significant portion had no direct experience.

When assessing intent to purchase, many respondents reported a "likely" or "very likely" stance, with younger generations showing a relatively higher inclination toward EV adoption. This is further supported by motivational factors such as environmental benefits and cost savings being cited as key drivers—particularly among the youth—while advanced technology holds consistent appeal across groups.

Brand recommendation ratings again reflect a central tendency around moderate favorability, suggesting cautious optimism or limited exposure. Notably, the biggest perceived barriers to EV adoption include high initial cost and inadequate charging infrastructure, concerns that are especially highlighted among the 18–40 demographic— pointing to a need for improved affordability and investment in support facilities.
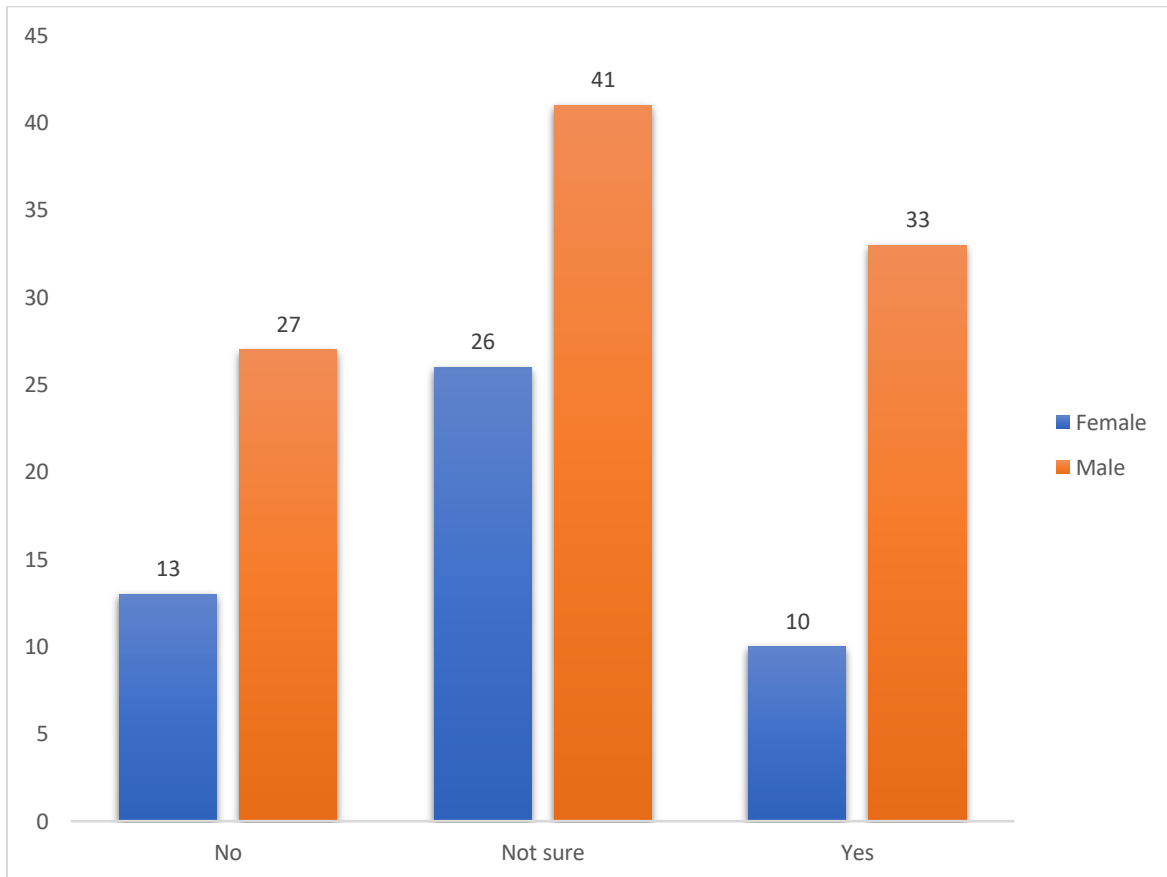
Availability of charging stations and repair services garnered mixed responses, with most respondents rating availability as moderate to low and expressing uncertainty about repair services, indicating infrastructural shortcomings that need to be addressed to build confidence in EV usage.

Finally, battery replacement cost emerged as a major concern, with a dominant share of respondents, particularly within the younger age group, indicating that it could discourage EV adoption. This highlights a critical area where both pricing transparency and technological innovation (such as battery leasing or warranty extensions) could play transformative roles.

In summary, the preliminary analysis underscores a promising level of awareness and a cautiously positive attitude towards EVs, particularly among the younger population. However, actual adoption remains hindered by infrastructural limitations, economic concerns, and information gaps. These insights provide a valuable foundation for tailoring more targeted and impactful marketing strategies, educational campaigns, and policy interventions to support the widespread adoption of electric vehicles in Thrissur district.

ANALYSIS OF

MARKETING OF EV BENEFITS

GOVERNMENT INCENTIVE SUPPORT

GRAPHICAL ANALYSIS OF EFFECTIVENESS OF MARKETING OF EVs FROM AMONG 150 RESPONDENTS

Pivot Table analysis on marketing of EVs being beneficial

among 150 respondents

The survey conducted to assess the effectiveness of electric vehicle (EV) marketing in benefiting customers yielded insightful responses from the 150 participants in the Thrissur district, Kerala. The respondents were asked whether they believed the marketing of electric vehicles is truly beneficial for consumers. The options provided were "Yes," "No," and "Not Sure."
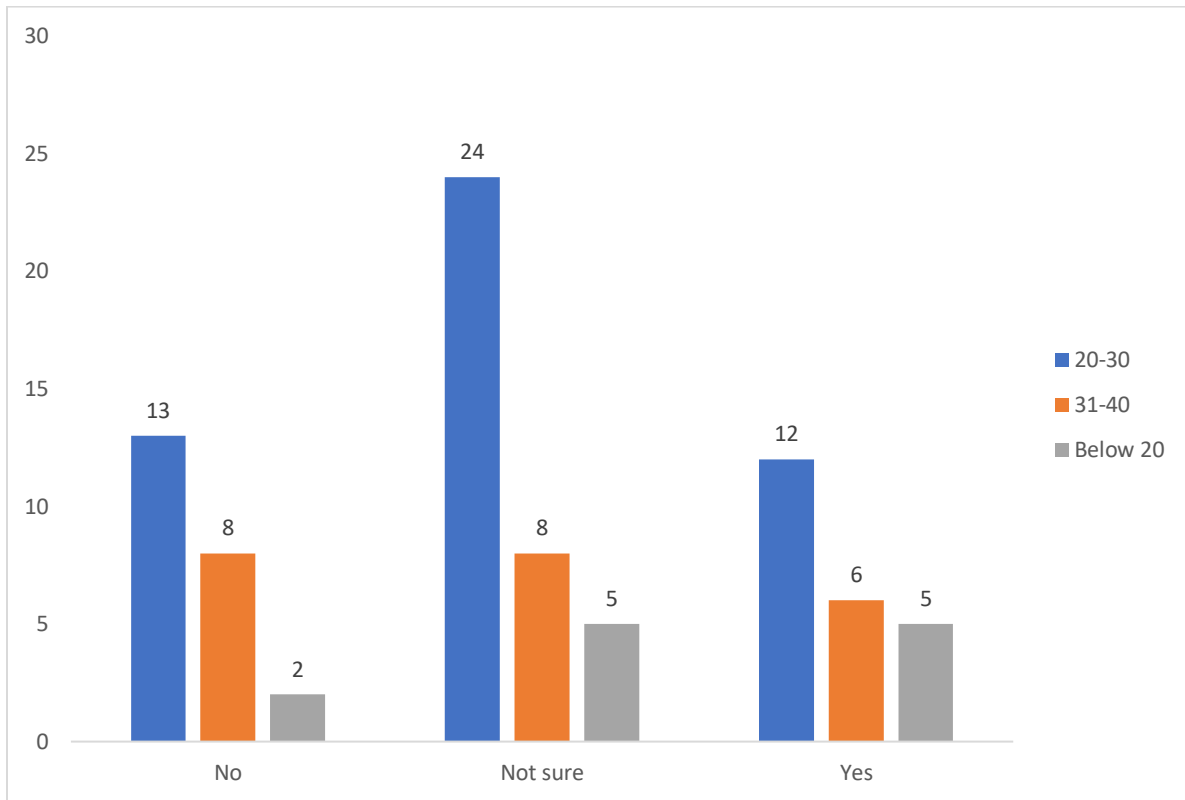
The analysis revealed that a significant portion of respondents expressed skepticism regarding the effectiveness of EV marketing. 40 individuals chose the "No" option, indicating a considerable group of individuals who do not feel that current marketing efforts for electric vehicles are beneficial to consumers.

On the other hand, a larger group of respondents, comprising 67 individuals, opted for the "Not Sure" option, suggesting uncertainty about the value or impact of the marketing strategies employed for electric vehicles.

Meanwhile, the "Yes" option was selected by 43 individuals, representing a smaller group who believe that the marketing efforts for electric vehicles are indeed beneficial for customers.

This graphical analysis highlights the mixed perceptions regarding the effectiveness of EV marketing. **While there is some support for the notion that marketing is beneficial, a notable portion of respondents remain unsure, and an even larger group feels that the marketing strategies are not delivering significant value to potential customers.** These insights provide valuable direction for improving EV marketing strategies, particularly in addressing consumer uncertainty and enhancing the perceived value of marketing efforts in this growing sector.

GRAPHICAL ANALYSIS OF EFFECTIVENESS OF MARKETING OF EVs FROM AMONG AGE GROUP 18 - 40 RESPONDENTS

Pivot Table analysis on marketing of EVs being beneficial among age group 18 – 40 respondents

The survey conducted to analyze the effectiveness of electric vehicle (EV) marketing within the age group of 18 to 40 years provides insightful data on how different age sub-groups perceive the benefits of current EV marketing efforts. The responses were categorized into three options: "Yes," "No," and "Not Sure," with each age group—20 to 30 years, 31 to 40 years, and below 20 years—showing varying levels of agreement or uncertainty regarding the effectiveness of EV marketing.

Among the age group, the majority of individuals, 24 respondents, selected the "Not Sure" option, indicating a significant level of uncertainty about the marketing's impact. In contrast, 12 individuals from this age group felt that the marketing was beneficial ("Yes"), while 13 individuals expressed the opposite ("No"). This suggests a mix of skepticism and recognition of value, with a slight majority uncertain about the marketing's effectiveness.
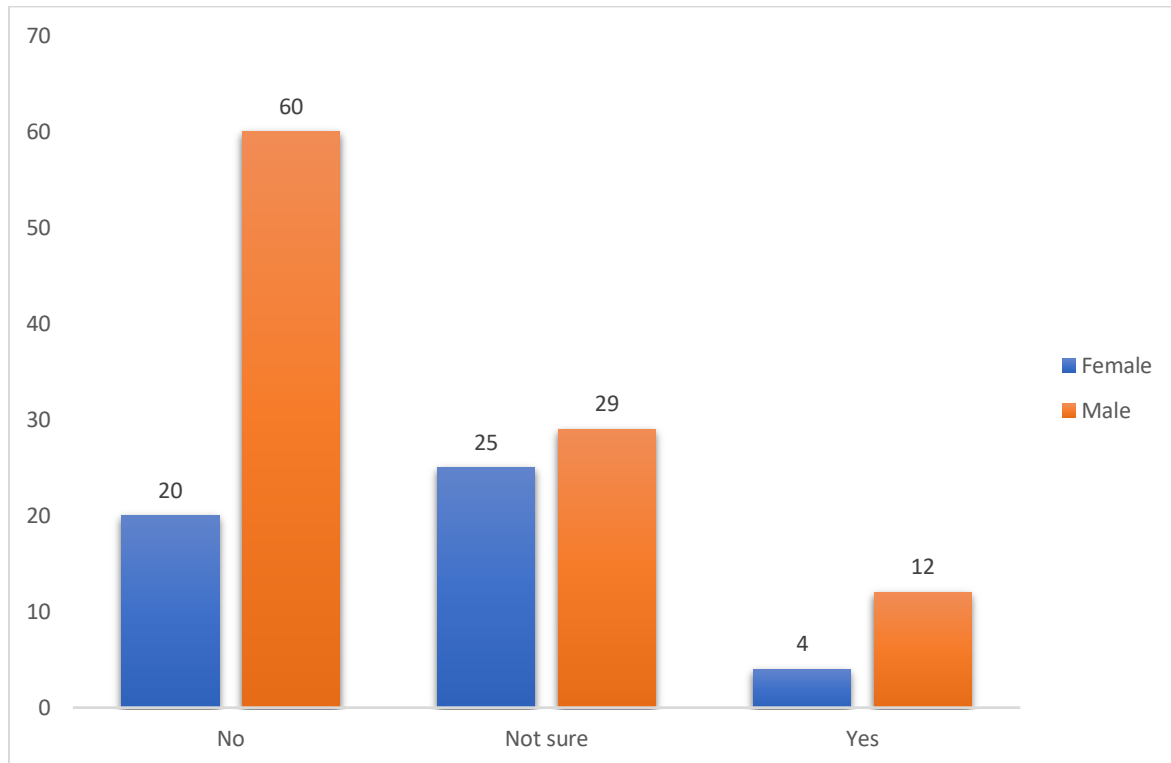
The 31 to 40 years age group showed a similar trend, with 8 respondents selecting "Not Sure," 6 opting for "Yes", and 8 choosing "No". This group also reflects a mix of opinions, with no clear consensus on the effectiveness of EV marketing, though the "Not Sure" responses indicate a considerable level of indecision.

For the below 20 years age group, 5 respondents felt that the marketing was effective ("Yes"), 2 opted for "No", and 5 selected "Not Sure". While a small sample size, this data shows that even in the younger age group, there is uncertainty about the value of the marketing strategies being employed for EV adoption.

The overall analysis of these age sub-groups underscores that while there is some recognition of the benefits of EV marketing, there is a notable level of skepticism and uncertainty. This demographic, being highly exposed to evolving technologies, seems to be more critical of the strategies used in marketing electric vehicles. These findings emphasize the importance of refining marketing approaches to address consumer uncertainty, particularly in the younger generation, who are more likely to offer constructive feedback on technological advancements.

GRAPHICAL ANALYSIS OF SUFFICIENCY OF GOVERNMENT INCENTIVES

ON ADOPTION OF EVs AMONG 150 RESPONDENTS

Pivot Table analysis on sufficiency of government incentives on adoption of EVs among 150 respondents

The survey analysis conducted in Thrissur district, Kerala, aimed at understanding public perception regarding government incentives for adopting or buying electric vehicles (EVs), presents insightful data on the sufficiency of such incentives. The survey received a total of 150 responses, with three options provided: "Yes," "No," and "Not Sure."
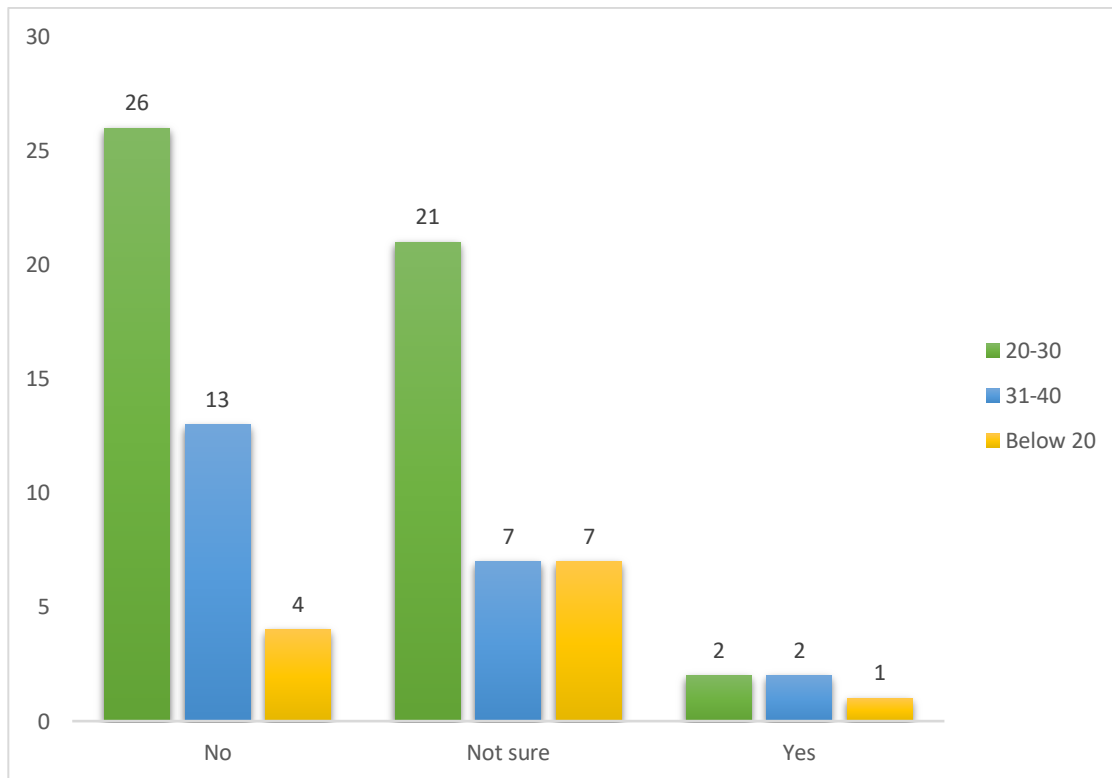
Among the respondents, the majority expressed skepticism about the sufficiency of government incentives. A total of 80 individuals (60 males and 20 females) chose the "No" option, indicating that they do not believe the existing incentives are sufficient to encourage the adoption of electric vehicles. This highlights a significant perception that current government incentives may not be compelling enough to drive widespread EV adoption.

On the other hand, 54 respondents (25 females and 29 males) selected the "Not Sure" option, suggesting that while they may be uncertain about the adequacy of incentives, they remain open to the possibility. This indicates a need for further clarification or information on government programs to influence this group's opinion.

Lastly, only 16 individuals (4 females and 12 males) expressed confidence in the current government incentives, choosing the "Yes" option. This relatively small group represents those who feel that the existing incentives are sufficient to support EV adoption.

The data indicates a clear trend of skepticism towards the sufficiency of government incentives, with the majority of respondents either uncertain or critical of the current offerings. This suggests that while there is some level of awareness and interest in EVs, government incentives may need to be enhanced or better communicated to encourage more widespread adoption.

GRAPHICAL ANALYSIS OF SUFFICIENCY OF GOVERNMENT INCENTIVES ON ADOPTION OF EVs AMONG AGE GROUP 18 - 40 RESPONDENTS

Pivot Table analysis on sufficiency of government incentives on adoption of EVs among age group 18 – 40 respondents

The survey analysis conducted among the younger generation, specifically targeting the age groups 18 - 40 sought to understand perceptions on the sufficiency of government incentives for adopting electric vehicles (EVs). The analysis aimed to capture the views of those more exposed to evolving technology, as younger generations are generally more attuned to advancements and potential improvements in technological products, such as electric vehicles.

The responses to the question regarding whether government incentives are sufficient for the adoption of EVs were categorized into three options: "No," "Not Sure," and "Yes." Among the age group 20 to 30, the majority expressed skepticism about the sufficiency of government incentives. A total of 26 individuals from this group selected the "No" option, indicating that they did not find the current incentives sufficient. Similarly, 21 individuals from the same age group chose the "Not Sure" option, suggesting uncertainty or a need for more information. Only 2 individuals from this group believed that the government incentives were sufficient, opting for the "Yes" option.

In the 31 to 40 age group, 13 individuals selected the "No" option, while 7 individuals expressed uncertainty by choosing "Not Sure." Similarly, only 2 individuals from this group felt that the government incentives were sufficient and opted for the "Yes" option.

For the below 20 age group, 4 individuals indicated that government incentives were insufficient by selecting the "No" option. 7 individuals from this group chose "Not Sure," while only 1 individual selected the "Yes" option, indicating a relatively small proportion of respondents who felt positively about the existing incentives.

The data suggests a significant level of skepticism and uncertainty across the younger generation regarding the adequacy of government incentives for EV adoption. With a majority expressing doubts or indecision, it appears that there is a need for either more robust incentives or better communication of the existing programs to encourage the younger population to consider EV adoption more seriously.

CHAPTER 4

RESULTS AND DISCUSSIONS

COMPREHENSIVE ANALYSIS OF THE SURVEY

The present study, titled *"Study on Adoption and Marketing Strategies for Electric Vehicles in Thrissur District, Kerala,"* aims to understand the level of awareness, ownership, user perception, influencing factors, and barriers associated with electric vehicles (EVs) among the local population, with a special focus on the younger generation (Gen Z and Millennials, aged 18–40). The analysis was derived from responses collected from 150 individuals across Thrissur district, utilizing Power BI and pivot tables to generate graphical and statistical insights.

◈1: Gender Distribution

Out of 150 total respondents, **101 were male and 49 females**. Among Gen Z and Millennials (83 respondents), **47 were male and 36 females**, suggesting fairly balanced representation in the younger age cohort.

◈2: Familiarity and Ownership

While familiarity with EVs was high (129 respondents across all age groups), **actual ownership remained low**—only **8 out of 150 owned an EV**. In the 18–40 age group, only **6 individuals** reported EV ownership, indicating a **gap between awareness and adoption**.

◈3: Comfort Level with EVs

Comfort was rated on a scale of 1 (low) to 5 (high). Gen Z and Millennials showed more

positive comfort ratings (4–5) compared to older groups. This underscores that **younger consumers are more comfortable and receptive** to EV technology than their older counterparts.

◈4: Experience with EVs

A significant portion had **no hands-on EV experience** (82 of 150), but **positive experiences ("much better" or "slightly better") outweighed negative ones**, especially among the 18–40 demographic. This points to **potential for growth** with better exposure and test-drive opportunities.

◈5: Adoption Interest (Next 3 Years)

Among the youth (18–40), a strong majority expressed **high likelihood of EV adoption**, whereas older respondents showed more neutral or unlikely stances. This reinforces the importance of **targeting youth with adoption campaigns**.

◈6: Marketing Effectiveness

Marketing efforts appear **inconclusive or ineffective**, particularly for women and respondents over 30. A large segment reported being **"Not Sure" about marketing effectiveness**, highlighting the need for **more tailored and visible messaging**.

◈7: Awareness of Government Incentives

Awareness of government support was **alarmingly low across all age groups**, especially the younger generation. This points to a **missed communication opportunity** for both policymakers and manufacturers.

◈8: Attractive EV Features

Across all respondents:

- **Cost Savings** and **Environmental Benefits** were the most appreciated features.

- Gen Z/Millennials were particularly motivated by **technology and environmental impact**, while males prioritized **cost savings** more than females.

◈9: Brand Association

Tata Motors emerged as the most associated EV brand (58% overall), followed by **Ather** and **Ola**. Among Gen Z and Millennials, **Tata still leads**, but **Ola's popularity increases**, showcasing their **strong digital brand reach among the youth**.

◈10: EV Recommendation Rating

Recommendation ratings were higher among **younger respondents**, with a good number rating 4 or 5. In contrast, older age groups had more ratings in the 1–3 range, suggesting the **need for more trust-building and visibility among senior consumers**.

◈11: Barriers to EV Adoption

The **two biggest barriers** were:

- **Limited charging infrastructure (41.3%)**

- **High initial cost (33.3%)**

For Gen Z and Millennials, these two factors were nearly equally concerning. Other concerns like **low driving range and lack of awareness** were significantly less frequent, indicating clear areas for improvement.

◈12: Charging Station Feedback

Respondents rated availability of charging infrastructure mostly in the **2–3 range**, again emphasizing **infrastructural shortcomings**. Higher age groups were particularly dissatisfied, while younger users were neutral to slightly positive.

◈13: Accessibility of Servicing

More than half of respondents across all age brackets were **"Not Sure" about service and repair options**, with a small number saying "No." This insight shows that even **interested consumers hesitate due to service uncertainty**.

◈14: Battery Replacement Cost Concern

A **majority across age groups expressed concern** about the cost of battery replacement. Especially in the 20–30 age bracket, many responded with "Definitely Yes" or "Probably Yes," showing that **total cost of ownership is a major adoption blocker**.

CHAPTER 4

SUMMARY AND CONCLUSIONS

The study titled *"Study on Adoption and Marketing Strategies for Electric Vehicles in Thrissur District, Kerala"* presents a thorough analysis of public perception, awareness, ownership patterns, and factors influencing the adoption of electric vehicles (EVs) within the region. Utilizing data collected from 150 respondents, the study incorporated demographic distinctions, particularly emphasizing the technologically exposed Gen Z and millennial population aged 18–40, for sharper insight into evolving market dynamics. The analysis was carried out using tools such as Power BI and pivot tables, allowing for detailed visual and statistical interpretation.

General Familiarity and Ownership

The results of the survey reveal a significant level of familiarity with EVs among the general population, with 85 males and 44 females responding "Yes", while only 19 respondents marked "No." Interestingly, the younger age group of 18–40 showed even stronger awareness, particularly with 44 males and 35 females confirming familiarity, which indicates that younger individuals are far more exposed to the EV ecosystem due to their interaction with technology and modern transportation culture.

However, actual EV ownership remains very low. From the entire sample, only 14 individuals (10 males and 4 females) reported owning an EV. Within the 18–40 age group, ownership is similarly modest (6 individuals), **reflecting that exposure and awareness have not yet translated into large-scale adoption, potentially due to economic or infrastructural limitations.**

Comfort, Experience, and Approach Toward EVs

Comfort ratings compared to fuel vehicles showed a generally favorable response. Most respondents leaned towards moderate to high comfort ratings (3–5 scale), with the highest cluster around rating 3 and 4. Younger age groups also showed comfort, especially those in the 20–30 age range. This suggests that while the user experience with EVs is not unanimously seen as superior, there is a positive perception shift among younger users.

In evaluating their perception of EV experience compared to fuel vehicles, a significant number of participants, especially among the youth, indicated either "slightly better" or "much better" experiences. However, a substantial portion still selected "No experience with EVs", highlighting the limited hands-on exposure to EVs despite high awareness.

When rating their approach to purchasing EVs, most participants fell between "likely" and "neutral", with fewer respondents indicating "very likely**."** Interestingly, a small but notable number in the younger group showed high enthusiasm, suggesting a potential target market for near-future EV sales with the right incentives and outreach.

Motivational Factors and Brand Perceptions

Among the motivating factors for EV adoption, environmental benefits stood out prominently, especially among female respondents and the younger generation. Cost savings and advanced technology were also significant drivers. However, government subsidies and incentives, while available, appeared under-acknowledged or underutilized, pointing toward a need for better public dissemination of such schemes.

Brand recognition was highest for Tata Motors, followed by Ather, indicating brand dominance and trust in established Indian automotive names. Among youth, Tata and Ola also saw significant brand association, suggesting marketing efforts by these brands are resonating well with this segment.

In terms of brand recommendation ratings, most people scored in the mid-range (rating 3), showing moderate satisfaction or limited experience, but with potential for positive word-of-mouth in the future.

Barriers to Adoption and Infrastructure Challenges

The key barriers to EV adoption identified in the study include:

- High initial cost
- Limited charging infrastructure
- Low driving range
- Lack of awareness

These challenges were consistent across age groups but were especially highlighted by the younger population as well, showing their critical evaluation of EV ecosystem readiness in the district.

Ratings on availability of charging stations were mostly average to low, with the majority giving a 2 or 3 out of 5. This suggests a clear infrastructure gap, particularly in semi-urban and rural parts of Thrissur, which must be addressed for a stronger EV push.

Similarly, repair and service facilities were either unknown or deemed unavailable by most respondents, showing another vital area where support systems for EVs are lagging behind traditional fuel vehicles.

Concerns and Public Sentiment

Battery replacement costs emerged as a significant concern, with most respondents, especially males, indicating that it could discourage EV adoption. This sentiment was echoed even more strongly in the 18–40 demographic, suggesting that despite their openness to innovation, cost uncertainty is a major psychological barrier.

When it came to evaluating the effectiveness of EV marketing strategies, responses were mixed. A substantial number selected "Not Sure", showing either marketing inefficiency or lack of recall. Only a smaller group believed the current marketing was effective, indicating a need for more targeted and consistent EV promotional campaigns.

Finally, when asked about government incentives, a large portion of the population—especially younger individuals—responded "No" or "Not Sure", suggesting dissatisfaction or unawareness of existing schemes. This underscores a crucial policy implication: unless incentives are made more accessible and visible, their intended impact may fall short.

Conclusion

The findings of this survey strongly indicate that Thrissur district exhibits a growing awareness and interest in electric vehicles, particularly among the younger population. However, actual adoption remains low, held back by factors such as high upfront costs, insufficient charging infrastructure, low public exposure to test-driving experiences, and limited government communication about support schemes.

The youth population (Gen Z and millennials) are emerging as a critical focus group, being more open, aware, and willing to adopt EVs compared to older demographics. Their concerns are rooted in practical limitations, such as driving range, cost, and support systems, rather than ideological resistance.

For EV adoption to scale effectively in Thrissur, multi-pronged strategies are essential. These include:

- **Strengthening charging and service infrastructure**
- **Enhancing visibility and reach of government incentives**
- **Promoting affordable EV models**
- **Strategic marketing tailored for digitally engaged youth audiences**
- **Encouraging public-private partnerships to drive ecosystem development**

This preliminary analysis provides strong groundwork for further studies into consumer segmentation, behavioral modelling, and policy effectiveness, enabling stakeholders to better strategize for a sustainable, electric-driven future in the district and beyond

CHAPTER 5

RECOMMENDATIONS

Recommendations Based on Survey Analysis

The survey-based analysis conducted on 150 respondents from Thrissur district, Kerala, offers insightful and multi-dimensional perspectives on the current perception, adoption, and potential market strategies for Electric Vehicles (EVs). A particular focus was placed on the younger generation (aged 18–40), considering their greater exposure to evolving technologies and cultural transitions. Based on the graphical and statistical breakdowns across 14 analytical themes, the following strategic recommendations are proposed for key stakeholders including policymakers, automobile manufacturers, marketers, and EV advocacy bodies:

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1. Enhance Awareness and Familiarity Campaigns

While a majority of the general population expressed familiarity with EVs, the data suggests significant gaps in deeper understanding and experiential engagement, especially among older age groups. Campaigns should go beyond advertisements and include:

- Hands-on test drives
- Tech-explainer content through local influencers
- EV experience fairs in urban and semi-urban centers of Thrissur

Why: A substantial number, especially females and individuals above 40, either lacked direct experience or showed lower confidence in EV familiarity.

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2. Strengthen EV Ownership Incentives

The ownership rates among respondents remain low, with clear hesitation even among younger, tech-savvy individuals. To encourage first-time ownership:

- Provide attractive, low-interest green (related to sustainability) loans
- Offer extended warranty packages and free service periods
- Enable flexible leasing or subscription models

Why: Younger demographics (18–40) showed willingness but cited cost and infrastructure limitations as barriers.

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3. Address Infrastructure Gaps: Charging and Repairs

The lack of charging stations and unclear availability of repair services were recurrent concerns across age groups. Recommendations include:
- Partnering with local fuel stations for hybrid EV-fuel station models
- Government-private sector collaboration for repair/service centers
- Create a location-based EV services mobile app for Thrissur residents

Why: A large number of respondents rated infrastructure availability poorly, particularly those in the 20–30 and 31–40 age brackets.

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4. Marketing Strategy Recalibration

Marketing effectiveness, especially in the younger generation, is currently insufficient. Recommendations include:
- Hyperlocal campaigns using Malayalam-language content
- Showcase user success stories in Thrissur (EV owners and their savings/benefits)
- Collaborate with local colleges, tech fests, and auto expos to attract youth engagement

Why: Many respondents expressed uncertainty or disappointment about the marketing visibility and outreach of EVs in the region.

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5. Tackle High Initial Cost Perception

Many potential buyers, especially Gen Z and millennials, view the upfront cost of EVs as a deterrent. Strategies to mitigate this include:

- Government-backed trade-in programs for old vehicles
- Tax breaks for salaried individuals investing in EVs
- Student discounts or family incentive schemes

Why: 'High initial cost' was the most frequently cited barrier, including among those most likely to adopt EVs.

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6. Promote Environment-Centric Messaging

Among all the motivating factors for EV adoption, *environmental benefits* were highly rated. Campaigns can leverage this:

- Link EV adoption to climate resilience messaging
- Position EVs as a conscious lifestyle upgrade
- Offer green certification or eco-badges to EV buyers in the district

Why: Especially among female respondents and the younger population, sustainability was a key driver for considering EVs.

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7. Focused Brand Positioning and Clarity

TATA emerged as the most recognized brand across all age groups, but others like Ather, Ola, and MG had varying levels of association. Recommendations:

- Strengthen visibility of all brands through cross-platform content in local dialects
- Educate people on the unique selling points (USP) of each EV brand

- Create comparison tools to help consumers choose the right EV

Why: While brand awareness exists, there is a lack of clarity in what each brand offers, leading to neutral or undecided opinions.

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8. Incentivize Battery Technology Trust

Battery replacement costs are a source of anxiety, especially among those aged 18–40 who are price-conscious and tech-aware. Strategies:

- Extended battery warranties
- Transparency on degradation and maintenance
- Introduction of battery-as-a-service models

Why: "Probably Yes" and "Definitely Yes" dominated responses to whether battery costs could discourage adoption.

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9. Government Policy Visibility and Accessibility

The data indicates a strong consensus that government incentives either are not enough or are not well understood. Recommendations:

- Regular public webinars and policy breakdowns
- EV policy kiosks or helpdesks at RTOs and automobile showrooms
- EV subsidy calculators and guides via mobile/web platforms

Why: The younger demographic was largely unsure or dissatisfied with current incentives, indicating a communication gap.

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10. Tap into Peer Recommendation Potential

Moderate scores on the recommendation of EVs to peers suggest cautious optimism but not strong advocacy.

To boost organic marketing:

- Establish user clubs and referral programs
- Feature real-user testimonials and community endorsements
- Offer loyalty benefits for referrals

Why: Word-of-mouth is strong in districts like Thrissur where community influence matters; increasing confidence can exponentially boost adoption.

Conclusion

The adoption of EVs in Thrissur is still in its nascent stage but demonstrates strong potential, especially among the 18–40 age group. The survey data clearly emphasizes the need for multidimensional strategies combining affordability, awareness, infrastructure development, and brand transparency. If acted upon, these recommendations can greatly accelerate the transition to electric mobility in Thrissur and offer a model for broader state-level implementation.

CHAPTER 6

LIMITATIONS OF THE PROJECT

While the present study on the adoption and marketing strategies for electric vehicles (EVs) in the Thrissur district of Kerala provides valuable insights, it is important to acknowledge several limitations that may have influenced the scope, depth, and accuracy of the findings. These limitations arise from methodological, demographic, and logistical constraints, and should be considered when interpreting the results or attempting to generalize them to broader populations.

1. Sample Size and Geographic Limitation

The research was conducted with a sample size of 150 respondents drawn exclusively from Thrissur district. While this provides a localized understanding, it limits the generalizability of the findings to other districts or states. The sample, though diverse in age and gender, may not fully represent the socio-economic and cultural heterogeneity of the wider Kerala population or the Indian market at large.

2. Demographic Concentration in Younger Age Groups

The survey paid special attention to respondents in the age group of 18 to 40, under the assumption that this generation (Gen Z and Millennials) are more technologically adept and culturally attuned to EV developments. While this approach yields targeted insights, it inadvertently sidelines the perspectives of older age groups (above 40), who may hold different but equally significant views—especially as potential consumers with greater purchasing power.

3. Reliance on Self-Reported Data

The data gathered for the survey are based on self-reported responses, which are inherently prone to subjectivity and bias. Respondents may have provided socially desirable answers, misunderstood questions, or made assumptions about EVs without firsthand experience. This is particularly evident in segments such as comfort ratings, perceptions of EV experience, and brand recommendations.

4. Lack of Longitudinal Perspective

The study offers a cross-sectional analysis, capturing attitudes and responses at a single point in time. Given the rapidly evolving nature of electric vehicle technology, infrastructure, and government policy, public opinion and market conditions may change significantly over a short period. A longitudinal study would provide more dynamic insights into shifting trends and behavioral changes over time.

5. Limited Exposure to EVs

A notable portion of respondents reported having "no experience with EVs", which could affect the validity of responses in perception-based questions (e.g., comfort comparison with fuel vehicles, brand recommendation, or perceived barriers). Evaluations from those unfamiliar with actual EV usage may be speculative rather than experiential, which can influence the authenticity of insights drawn.

6. Possible Gender Representation Imbalance

There is a visible skew in gender representation across some segments of the study, with more male respondents than female respondents in categories such as EV ownership, familiarity, and perception. This imbalance may inadvertently limit the study's inclusivity and fails to fully capture the gendered dimensions of EV adoption and perception.

7. Survey Design Constraints

Although Power BI and pivot tables were effectively used to visualize and interpret data, the range of response options in some survey questions may have been too narrow. For example, offering only five predefined responses in rating scales might oversimplify nuanced opinions. Moreover, some complex influencing factors such as psychological barriers, social acceptance, or comparative analysis of EV models were not covered due to survey length limitations.

8. Infrastructure and Contextual Data Gaps

The study touches upon infrastructure challenges such as availability of charging stations and repair services, but lacks detailed contextual or spatial mapping of these facilities within Thrissur. Without correlating responses with real-time geospatial infrastructure data, conclusions drawn on perceived limitations remain largely subjective.

9. Lack of Industry or Expert Perspective

The survey focused solely on public perception and consumer behavior, and did not incorporate insights from industry professionals, policymakers, or EV dealers. Including expert viewpoints could have provided depth and validation to consumer perspectives, especially regarding marketing effectiveness, policy awareness, and technological factors.

10. Language and Accessibility Barriers

It is possible that certain respondents may have faced language barriers or found difficulty in understanding technical terms related to EVs. Despite best efforts in survey design, comprehension issues could affect response accuracy, particularly among older or less-educated respondents.

Conclusion

In summary, while the survey delivers meaningful data on the perception and adoption trends of electric vehicles in Thrissur, Kerala, it must be viewed through the lens of the limitations outlined above. Recognizing these constraints not only enhances the transparency of the research process but also offers direction for future studies—such as expanding the sample base, conducting in-depth interviews, or including real-time infrastructure audits. By addressing these gaps, subsequent research can provide a more holistic and reliable foundation for strategic decision-making in the EV sector

CHAPTER 7

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CHAPTER 8

ANNEXURE/APPENDIX

ANNEXURE/APPENDIX

QUESTIONNAIRE

1. What is your age group?
Below 20
20-30
31-40
41-50
Above 50

2. What is your gender?
Male
Female
Others
Prefer not to say

3. What is your profession status?
Student
Employed
Homemaker
Retired
Others

4. What is your monthly income?
Less than ₹20,000
₹20,000-₹50,000
₹50,001-₹1,00,000
₹1,00,000- 2,00,000
Above ₹ 2,00,000

5. Are you familiar with the concept of electric vehicles (EVs)?
Yes
No

6. Do you own an EV?
Yes
No

7. How likely are you to consider buying an EV in the next 3 years?
Very likely
Likely
Neutral
Unlikely
Very unlikely

8. What is the main factor that attracts you to EVs?
Cost savings
Environmental benefits
Advanced technology
Government subsidies
Other

9. How would you compare the driving experience of EVs to petrol/diesel vehicles? (If experienced).
Much better
Slightly better
About the same
Worse
No experience with EVs

10. Do you believe EVs are a better alternative to petrol/diesel vehicles?
Strongly agree
Agree
Neutral
Disagree
Strongly disagree

11. Rate your trust in the safety and comfort of EVs compared to traditional vehicles.
Very high
High
Neutral
Low
Very low

12. What is the biggest barrier to adopting EVs?
High initial cost
Limited charging infrastructure
Low driving range
Lack of awareness
Other

13. How satisfied are you with the availability of EV charging stations in Thrissur?
Very satisfied
Satisfied
Neutral
Dissatisfied
Very dissatisfied

14. Do you think government incentives for EVs are sufficient?
Yes
No
Not sure

15. Would the cost of replacing an EV battery discourage you from buying one?
Definitely yes
Probably yes
Probably No
Definitely No

16. Do you feel that servicing and repair expertise for EVs is readily available in Thrissur?
Yes
No
Not sure

17. Which EV brand do you associate the most with (select one)
Tata
Ola
Ather
MG
BYD

18. Do you think electric vehicles marketing effectively addresses your concerns about EV adoption?
Yes
No
Not sure

19. How likely are you to recommend EVs to your friends and family?
 (1 = Very unlikely, 2- Likely, 3- Neutral, 4- Likely, 5 = Very likely)

20. What additional features or services would convince you to switch to EVs? (Open-ended)
Approach & Purpose.