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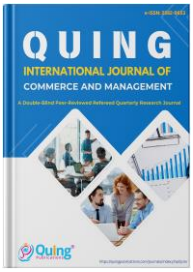

Public Perception and Adoption of Electric Vehicles in Chennai

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ABSTRACT

Driven by concerns about air pollution, climate change, and the depletion of fossil fuels, the shift to electric vehicles (EVs) is a crucial step toward sustainable transportation. This study examines the hurdles to EV adoption and public perception, with a focus on Chennai. The study employs a structured survey to explore how EV adoption is influenced by factors such as cost, public awareness, and charging infrastructure. According to research, electric vehicles (EVs) have both financial and environmental advantages; however, widespread adoption is hindered by issues such as high upfront costs, a shortage of charging stations, and concerns over battery sustainability. The study emphasizes that accelerating EV adoption and promoting a cleaner, greener future require governmental changes, improved infrastructure, and increased public awareness.

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1.0 INTRODUCTION

Electric Vehicles and Public Perception: Driving Towards a Sustainable Future. One of the most effective ways to combat climate change, air pollution, and the depletion of fossil fuels is to switch to electric vehicles, also known as EVs. Electric Vehicles (EVs) are a cleaner and more energy-efficient alternative to conventional Internal Combustion Engine (ICE) vehicles, which operate on petroleum-based fuels. This is especially true when fuelled by renewable energy sources, such as solar and wind. While automakers are developing battery technology to increase efficiency and reduce costs, governments throughout the world are encouraging the adoption of EVs through legislative incentives, subsidies, and regulations. Widespread adoption is still largely

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dependent on public opinion, with major obstacles including range anxiety, high initial prices, and charging infrastructure.

Notwithstanding these obstacles, ongoing technology developments are improving EV affordability, convenience, and efficiency. While ultra-fast charging stations and smart grid connections are addressing infrastructure issues, advancements in battery technology are enhancing durability, increasing driving ranges, and reducing charging times. However, as areas dependent on fossil fuel-powered grids might not completely eradicate emissions, the environmental advantages of EVs rely on clean electricity generation. To create sustainable battery solutions and expand clean energy infrastructure, governments, automakers, and energy suppliers must collaborate. EVs have the potential to transform transportation and help create a cleaner, greener, and more energy-efficient future as these obstacles are gradually removed.

1.1 Objective

1) To analyse the key factors influencing public perception and adoption of Electric Vehicles (EVs) in Chennai, including cost concerns, charging infrastructure availability, and awareness levels.
2) To examine the impact of charging infrastructure and public awareness on EV adoption rates, comparing adoption trends in well-developed areas like Anna Nagar and underdeveloped regions.
3) To assess the effectiveness of existing government incentives and policies in promoting EV adoption, identifying gaps, and suggesting improvements for a more sustainable transition.

2.0 REVIEW OF LITERATURE

Singh *et al.* (2020) conducted a review and meta-analysis of 211 publications to identify key elements influencing the adoption of electric vehicles (EVs), providing valuable insights for the industry and policymakers. Similarly, She *et al.* (2017) surveyed 476 people in Tianjin, China, to gauge the public's perception of battery electric cars (BEVs). They found that people were worried about safety, cost, range, and the availability of charging stations. Adnan *et al.* (2016) surveyed 120 respondents to analyse the technological, psychological, and economic impediments to EV adoption in Chennai. When considered collectively, these studies provide a comprehensive understanding of the obstacles and factors influencing EV adoption in various geographical regions.

3.0 METHODOLOGY

A structured questionnaire was used to gather responses from 88 participants in Chennai, focusing on key aspects such as awareness levels, cost concerns, infrastructure availability, and the perceived environmental impact of electric vehicles (EVs). To analyse regional disparities in adoption, an Independent T-Test was conducted, assessing the statistical significance of differences in EV adoption between areas with well-developed charging infrastructure and higher public awareness compared to regions with limited facilities. Additionally, a case study comparison between Anna Nagar, known for its robust infrastructure and greater EV awareness, and remote areas with inadequate charging stations and lower awareness levels provided further insights into the influence of external factors on adoption rates. The study highlights the crucial role of accessibility, financial incentives, and public perception in influencing EV adoption patterns, underscoring the need for targeted policy interventions to bridge the gap between developed and underdeveloped regions.

3.1 Independent T-Test

- **H_1:** There is no significant difference in the average greenhouse gas emissions between regions with high electric vehicle adoption and areas with low electric vehicle adoption.

Question	t-Value	df	p-Value
To what extent do you believe EV adoption reduces greenhouse gas emissions in your region?	2.740	37	0.009
Do you think the air quality in your region has improved with the increased use of EVs?	1.189	37	0.242
Has EV adoption reduced the region's reliance on fossil fuels for transportation?	-0.121	37	0.904

The general public believes that EV adoption lowers greenhouse gas emissions, although this belief is based on opinion rather than empirical evidence. Many people remain unconvinced that the popularity of electric vehicles (EVs) has significantly improved air quality despite this. Furthermore, many people doubt that the adoption of electric vehicles (EVs) has reduced the region's reliance on fossil fuels. These issues draw attention to the need for additional studies, open data, and education initiatives to close the gap between perception and fact about the environmental effects of EVs.

- **H_2:** The adoption rate of electric vehicles (EVs) in Chennai is not significantly influenced by the availability of charging infrastructure and public awareness about EV benefits

Question	t-Value	df	p-Value
Do you currently own or plan to own an electric vehicle?	5.941	76.707	<.001

The substantial disparity in EV adoption between those who have access to information and charging stations and those who do not highlight the importance of both infrastructure and awareness. It is not accepted that charging stations and knowledge have no impact because this difference is statistically significant. A real-world comparison further supports this conclusion. Residents in Anna Nagar are more likely to buy or consider buying an electric vehicle (EV) because the area has a large number of EV charging stations and regular awareness efforts. However, adoption rates remain low in isolated locations with inadequate charging infrastructure and limited access to EV-related information. This suggests that carefully thought-out infrastructure development and targeted awareness campaigns can significantly impact public opinion and promote the adoption of EVs, making them essential components of any plan to advance sustainable mobility.

4.0 SUGGESTIONS

Increasing the availability of charging stations can help reduce range anxiety and encourage the use of electric vehicles (EVs), particularly in rural areas. Sustainability will be improved by incorporating renewable energy, increasing public awareness, and fortifying financial incentives. Corporate adoption of EV fleets, stricter fuel laws, and battery recycling programs can also accelerate the shift to electric mobility. Long-term growth can be fuelled by government initiatives that support EV production, studies on cutting-edge battery technology, and partnerships between the public and private sectors.

A smooth transition to a cleaner and more effective transportation system will also be facilitated by investments in smart grids, incentives for home charging stations, and the creation of EV friendly urban design.

5.0 CONCLUSION

The adoption of electric vehicles (EVs) in Chennai has both benefits and drawbacks. Although EVs offer benefits such as reduced emissions and improved fuel efficiency, problems including high costs, a shortage of charging stations, and limited awareness prevent EVs from being widely adopted. Places with better infrastructure, like Anna Nagar, have higher adoption rates than those farther away. To expedite this transition, policymakers and corporate leaders must establish charging networks, enhance financial incentives, and integrate renewable energy sources.

Public perception is crucial. Thus, awareness campaigns are necessary to dispel myths such as range anxiety and battery sustainability concerns. With strong legal backing and advancements in battery recycling, Chennai can lead the way in eco-friendly transportation by promoting the use of electric vehicles (EVs).

REFERENCES

Adnan, N., Nordin, S. M., Rahman, I., Vasant, P. M., & Noor, A. (2017). A comprehensive review on theoretical framework-based electric vehicle consumer adoption research. *International Journal of Energy Research*, *41*(3), 317-335. https://doi.org/10.1002/er.3640

Remya, S. S., & Kavitha, S. (2023). The Marketing Stimulus and Motives Adopted by the Online Retailers and its Impact on the Customer Purchase Decision-A Conceptual Study. *Quing: International Journal of Commerce and Management, 3*(1), 32-38. https://doi.org/10.54368/qijcm.3.1.0005

She, Z. Y., Sun, Q., Ma, J. J., & Xie, B. C. (2017). What are the barriers to widespread adoption of battery electric vehicles? A survey of public perception in Tianjin, China. *Transport Policy*, *56*, 29-40. https://doi.org/10.1016/j.tranpol.2017.03.001

Singh, V., Singh, V., & Vaibhav, S. (2020). A review and simple meta-analysis of factors influencing adoption of electric vehicles. *Transportation Research Part D: Transport and Environment*, *86*, 102436. https://doi.org/10.1016/j.trd.2020.102436

Sunita, C. (2023). Consumer Perception Towards Sustainable Packaging in E-Commerce Industry: A Factor Analytic Approach. *Quing: International Journal of Commerce and Management*, *3*(2), 177-185. https://doi.org/10.54368/qijcm.3.2.0012