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Purchase Decision of Electric Vehicles: A Study with Special Reference to Coimbatore City

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Abstract- The global shift towards sustainable transportation has intensified interest in electric vehicles (EVs) as a viable alternative to conventional internal combustion engine (ICE) vehicles. India, as one of the fastest-growing automobile markets in the world, has witnessed a significant surge in EV adoption driven by government incentives, rising fuel prices, and heightened environmental awareness. Coimbatore, often referred to as the "Manchester of South India," is emerging as a key hub for EV adoption owing to its strong industrial base, educated urban population, and growing middle-class segment. This study aims to examine the factors influencing the purchase decision of electric vehicles among consumers in Coimbatore. A structured questionnaire was administered to a sample of 350 respondents selected through stratified random sampling. The data were analysed using descriptive statistics, chi-square tests, factor analysis, and multiple regression analysis. The findings reveal that government subsidies and incentives, total cost of ownership, environmental consciousness, technological features, charging infrastructure availability, and brand reputation are the primary determinants of EV purchase decisions. The study also identifies significant demographic differences in EV purchase intentions across gender, age, income, and educational qualification. The results provide actionable insights for automobile manufacturers, policymakers, and marketers to formulate effective strategies to accelerate EV adoption in Tier-II Indian cities.

Keywords: Electric Vehicles, Purchase Decision, Consumer Behaviour, Coimbatore, EV Adoption, Sustainable Transportation, Factor Analysis

I. INTRODUCTION

The transportation sector globally contributes approximately 24% of direct CO_2 emissions from fuel combustion, making it one of the largest contributors to greenhouse gas emissions. In response, governments and industries worldwide have pivoted towards electric mobility as a cornerstone of sustainable development strategies. India, committed under the Paris Agreement to reduce its emissions intensity by 45% by 2030, has launched ambitious EV promotion programmes including the Faster Adoption and Manufacturing of Electric Vehicles (FAME) scheme and Production Linked Incentive (PLI) for advanced battery chemistry. The Indian EV market registered a remarkable growth of 49% year-on-year in FY 2023-24, with total EV sales exceeding 1.67 million units across all segments. The two-wheeler segment dominates this market, followed by three-wheelers and passenger cars. Tamil Nadu, with a vibrant automotive manufacturing ecosystem, has positioned itself as a leading EV destination through the Tamil Nadu EV Policy 2023, which envisions an

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investment of ₹50,000 crore and creation of 1.50 lakh direct employment opportunities by 2030.

Coimbatore, with a population of approximately 2.2 million (UA), is a significant industrial and commercial city in Tamil Nadu. Known as the hub of textile, pump manufacturing, and engineering industries, the city has an active and growing automotive consumer base. Its educated middle-class population, reasonable disposable income levels, and rising environmental consciousness make it a particularly relevant context for studying EV purchase behaviour. However, empirical research specifically focused on Coimbatore remains sparse, creating a knowledge gap this study endeavours to fill. Consumer decision-making for EVs is a complex, multi-criteria process influenced by economic, psychological, social, and technological factors. While existing literature provides broad frameworks, the relative influence of these factors varies considerably across geographic, cultural, and socioeconomic contexts. Understanding these local dynamics is critical for tailoring marketing, policy, and infrastructure strategies to specific markets. Accordingly, this study investigates the determinants of EV purchase decisions in Coimbatore, drawing on primary survey data from 350 respondents.

II. REVIEW OF LITERATURE

A substantial body of literature has explored consumer adoption of electric vehicles from various theoretical perspectives. This section synthesizes key studies relevant to the current research.

Noppers et al. (2014) examined symbolic attributes of EV adoption and found that consumers' desire to signal environmental values to their social peers significantly influenced EV purchase intentions. The study emphasized the role of subjective norms and social identity in sustainable consumption decisions. Similarly, Egbue and Long (2012) conducted focus group research in the United States and identified range anxiety, charging infrastructure inadequacy, and high upfront purchase prices as the foremost barriers to EV adoption, findings that have been replicated across multiple geographies.

Thøgersen and Møller (2008) applied the Theory of Planned Behaviour (TPB) to sustainable transportation choices, demonstrating that attitudes, subjective norms, and perceived behavioural control collectively predict EV adoption intentions. This theoretical framework has been widely adopted in subsequent EV consumer research. Graham-Rowe et al. (2012) used in-depth interviews to explore consumer perceptions in the UK and highlighted the importance of real-world driving experience and test drives in overcoming resistance to EV adoption.

In the Indian context, Agarwal et al. (2020) studied EV adoption intentions among urban consumers and found that fuel cost savings, government subsidies, and environmental benefits were the most cited motivators. Conversely, limited charging infrastructure and lack of after-sales service were identified as critical deterrents. A study by Verma et al. (2021) in Delhi NCR found that monthly income, education level, and familiarity with EV technology were significant predictors of purchase intentions. Kumar and Chakraborty (2022) examined the post-COVID shift in mobility preferences in metropolitan India and documented a heightened sensitivity to air quality and environmental health, which positively correlated with EV interest.

Research specifically addressing Tier-II Indian cities is comparatively limited. Mukherjee and Sen (2021) studied Kolkata consumers and noted that charging accessibility was a more significant concern than vehicle cost in shaping purchase decisions. Raj and Sreejesh (2022) found that peer influence and social proof are particularly potent drivers in smaller Indian cities where word-of-mouth networks are tighter. Sharma and Sahni (2023) highlighted that brand trust and after-sales service network meaningfully differentiate consumer preferences in semi-urban Indian markets.

In the Tamil Nadu context, Senthilkumar and Rajendran (2021) studied two-wheeler EV adoption in Madurai and Trichy and observed that daily commute distance, availability of home charging solutions, and total cost of ownership over three years were decisive factors. A study by Moorthy et al. (2022) in Chennai examined passenger car EV

adoption and found a positive association between technology innovativeness and willingness to pay a price premium for EVs. Balasubramaniam and Anand (2023) explored the role of government communication and awareness campaigns in shaping EV perceptions in secondary Tamil Nadu cities.

The literature consistently identifies a set of core determinants: economic factors (purchase price, fuel savings, total cost of ownership), infrastructure (charging network, home charging feasibility), policy incentives (subsidies, tax benefits), environmental attitudes, technological attributes (range, performance, technology features), and social influence. However, the relative weights of these factors, and how they interact with demographic characteristics in the specific context of Coimbatore, remain underexplored—a gap this study directly addresses.

Objectives of the Study

The specific objectives of this study are as follows:

- To study the socio-demographic profile of electric vehicle consumers in Coimbatore.
- To identify the key factors influencing the purchase decision of electric vehicles among Coimbatore consumers.
- To examine the relationship between demographic variables and the intention to purchase electric vehicles.
- To analyse the level of consumer awareness and satisfaction regarding electric vehicles and charging infrastructure.
- To suggest strategic recommendations for manufacturers, marketers, and policymakers to enhance EV adoption in Coimbatore.

III. RESEARCH HYPOTHESES

The following null hypotheses were formulated for empirical testing:

- $H_0$1: There is no significant association between gender and the purchase decision of electric vehicles.
- $H_0$2: There is no significant association between age group and the purchase decision of electric vehicles.
- $H_0$3: There is no significant association between monthly income and the purchase decision of electric vehicles.
- $H_0$4: There is no significant association between educational qualification and the purchase decision of electric vehicles.
- $H_0$5: The identified factors (economic, environmental, technological, policy, infrastructure, and social) do not significantly predict the electric vehicle purchase decision.

IV.. RESEARCH METHODOLOGY

1. Research Design

This study adopts a descriptive and analytical research design. A mixed-methods approach was employed: quantitative data from structured questionnaires were supplemented by qualitative insights gathered through informal interviews with select respondents. The research is cross-sectional in nature, with data collected during the period August to November 2025.

2. Study Area

The study was conducted in Coimbatore city and its urban agglomeration, covering localities including Gandhipuram, RS Puram, Peelamedu, Saibaba Colony, Vadavalli, Singanallur, Thudiyalur and Kovaipudur. These areas represent a diverse cross-section of Coimbatore's residential, commercial, and industrial neighbourhoods, ensuring geographic and socioeconomic diversity in the sample.

3. Population and Sample Size

The target population consists of all individuals residing in Coimbatore who own, have recently purchased, or are considering purchasing a vehicle (either electric or conventional). Given the absence of a precise enumeration of this population, the sample size was determined using Cochran's formula for unknown population proportions:

$$N = Z^2pq / e^2$$

Where Z = 1.96 (at 95% confidence level), p = 0.5 (maximum variability), q = 1 - p = 0.5, and e = 0.05 (margin of error). This yields $n = (1.96)^2 \times 0.5 \times 0.5 / (0.05)^2 = 384$. Accounting for a 10% non-response

rate, the target was 350 valid, fully completed questionnaires, which was achieved.

4. Sampling Technique

Stratified random sampling was employed, with strata defined by residential locality and vehicle ownership status. Respondents were further categorised into current EV owners (n=98), intending purchasers (n=152), and conventional vehicle owners with EV awareness (n=100). Within each stratum, simple random sampling was applied. The sample was collected through both field surveys (shopping malls, automobile showrooms, petrol stations) and an online Google Form administered through social media channels.

5. Data Collection Instrument

The primary data collection instrument was a structured questionnaire developed in English and Tamil. The questionnaire comprised four sections: (i) Socio-demographic profile (8 items), (ii) Awareness and current vehicle ownership (5 items), (iii) Factors influencing EV purchase decision rated on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) (32 items), and (iv) Overall purchase intention and satisfaction (5 items). The questionnaire was validated through face validity review by three domain experts and pilot tested on 30 respondents. Reliability was assessed using Cronbach's Alpha, which yielded a value of 0.879, indicating excellent internal consistency.

6. Analytical Tools

The collected data were coded, cleaned, and analysed using IBM SPSS Statistics Version 26. The following statistical tools were employed: (i) Descriptive statistics (frequency, percentage, mean, standard deviation) for demographic profiling and factor rating analysis; (ii) Chi-square test of independence for hypothesis testing regarding demographic associations; (iii) Exploratory Factor Analysis (EFA) with Principal Component Analysis (PCA) and Varimax rotation to identify underlying factor structures; and (iv) Multiple Linear Regression Analysis to determine the predictive power of identified factors on EV purchase decision.

VI. DATA ANALYSIS AND INTERPRETATION

1. Socio-Demographic Profile of Respondents

Table 1 presents the socio-demographic characteristics of the 350 respondents. The sample was predominantly male (62%), reflecting the higher vehicle ownership rates among men in Coimbatore. The age distribution shows that the 26-35 age group constitutes the largest segment (34.3%), followed by the 36-45 group (26.3%), indicating strong interest from working-age adults. Graduates form the largest educational category (44%), followed by postgraduates (31.1%). Monthly income in the ₹30,001-50,000 bracket is most prevalent (33.7%), consistent with Coimbatore's industrial middle-class demographic. Private sector employment dominates (41.1%) followed by business/self-employment (26.9%).

Table 1: Socio-Demographic Profile of Respondents

Variable	Category	Frequency (N = 350)	Percentage (%)
Gender	Male	217	62.0
	Female	133	38.0
Age Group	Below 25 years	63	18.0
	26 – 35 years	120	34.3
	36 – 45 years	92	26.3
	46 – 55 years	54	15.4
	Above 55 years	21	6.0
Education	HSC / Diploma	67	19.1
	Undergraduate (UG)	154	44.0
	Postgraduate (PG)	109	31.1
	Professional / PhD	20	5.7

Monthly Income	Below ₹20,000	48	13.7
	₹20,001 – ₹30,000	87	24.9
	₹30,001 – ₹50,000	118	33.7
	₹50,001 – ₹80,000	68	19.4
	Above ₹80,000	29	8.3
Occupation	Government Employee	66	18.9
	Private Sector	144	41.1
	Business / Self-Employed	94	26.9
	Student	30	8.6
	Retired / Homemaker	16	4.6

2. Awareness and EV Ownership Profile

Among the 350 respondents, 28% (n=98) currently own an electric vehicle, predominantly in the two-wheeler segment (79 of the 98 EV owners). A significant 73% reported being aware of government subsidies for EVs, although only 41% correctly identified the specific benefits under the Tamil Nadu EV Policy 2023. Regarding charging infrastructure, 63% indicated that public charging stations in their locality were inadequate for daily usage, while 54% expressed willingness to install a home charging unit if their residence permitted. The primary source of EV information was identified as social media (38%), followed by automobile dealerships (27%), television advertisements (18%), and word of mouth (17%).

3. Descriptive Statistics of Factors Influencing EV Purchase Decision

Table 2 presents the mean scores and standard deviations of the 32 items measuring factors influencing EV purchase decisions, grouped by thematic categories. Items are rated on a 1–5 Likert scale.

Table 2: Descriptive Statistics of Influencing Factors

S.No	Statement	Mean	Std. Dev.
	A. Economic Factors		
1	High upfront purchase price of EVs discourages me from buying.	4.21	0.74
2	Lower running cost (₹1–2/km vs ₹5–7/km for petrol) motivates EV purchase.	4.43	0.61
3	Reduced maintenance cost (no oil change, fewer moving parts) is appealing.	4.37	0.66
4	Total cost of ownership over 3–5 years favours EVs over petrol vehicles.	4.11	0.79
	B. Environmental Factors		
5	I am concerned about air pollution in Coimbatore and EVs help address it.	4.29	0.71
6	Purchasing an EV reflects my commitment to environmental sustainability.	4.18	0.77
7	Noise pollution reduction from EVs is an important benefit.	3.94	0.88
	C. Government Policy & Incentives		
8	Government subsidies under FAME II scheme reduce EV purchase barrier.	4.52	0.59
9	GST reduction (5% vs 28% for ICE) makes EVs financially attractive.	4.44	0.62
10	Tamil Nadu EV Policy 2023 incentives motivate me to consider EVs.	4.31	0.69
	D. Infrastructure Factors		
11	Inadequate public charging stations in Coimbatore concern me.	4.47	0.65
12	Range anxiety (fear of battery running out) deters EV purchase.	4.38	0.68

S.No	Statement	Mean	Std. Dev.
13	Availability of home charging facility is essential for EV adoption.	4.26	0.73
	E. Technological Factors		
14	Advanced technological features (regenerative braking, connectivity) attract me.	4.09	0.82
15	Battery performance and longevity are critical to my EV decision.	4.55	0.57
16	I trust the technology and safety systems in modern EVs.	3.87	0.91
	F. Social & Brand Factors		
17	Friends' and family's positive experience with EVs influences my decision.	4.02	0.85
18	Brand reputation and after-sales service network are decisive factors.	4.34	0.67
19	Owning an EV projects a positive social image and status.	3.78	0.94

4. Chi-Square Test Results – Hypothesis Testing

Chi-square tests of independence were performed to examine associations between demographic variables and EV purchase decisions. The results are summarised in Table 3.

Table 3: Chi-Square Test Results

Demographic Variable	Chi-Square Value (χ^2)	df	p-value	Decision (α=0.05)
Gender	12.847	4	0.012*	Reject $H_0$1
Age Group	28.634	16	0.026*	Reject $H_0$2
Monthly Income	41.289	16	0.001**	Reject $H_0$3
Educational Qualification	19.542	12	0.077	Accept $H_0$4

Significant at 5% level ** Significant at 1% level

The chi-square analysis reveals that gender (χ^2=12.847, p=0.012), age group (χ^2=28.634, p=0.026), and monthly income (χ^2=41.289, p=0.001) are significantly associated with EV purchase decisions. Accordingly, $H_0$1, $H_0$2, and $H_0$3 are rejected. Educational qualification (χ^2=19.542, p=0.077) does not show a statistically significant association, hence $H_0$4 is accepted. These results indicate that economic demographics are stronger predictors of EV purchase decisions than education level alone.

5. Factor Analysis

Exploratory Factor Analysis (EFA) was conducted on the 32 Likert-scale items using Principal Component Analysis with Varimax rotation. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.863, and Bartlett's Test of Sphericity was significant (χ^2=2847.34, df=496, p<0.001), confirming the suitability of the data for factor analysis. Six factors with eigenvalues greater than 1.0 were extracted, collectively explaining 68.47% of the total variance. Table 4 presents the rotated factor structure.

Table 4: Factor Analysis – Rotated Component Matrix (N = 350)

Item	Factor / Statement	Factor Loading	Eigen-value	Variance (%)
	Factor 1: Economic & Cost Benefits (Cronbach's α = 0.861)		5.43	17.00
F1a	Lower running and fuel cost savings from EV use	0.847		
F1b	Reduced maintenance expenses compared to ICE vehicles	0.821		
F1c	Favourable total cost of	0.798		

Item	Factor / Statement	Factor Loading	Eigen-value	Variance (%)
	ownership over 3–5 years			
	Factor 2: Government Policy & Incentives (Cronbach's α = 0.844)		4.87	15.22
F2a	FAME II subsidy and central government policy benefits	0.863		
F2b	GST reduction (5% vs 28%) making EVs financially viable	0.839		
F2c	Tamil Nadu state EV policy and subsidy framework	0.812		
	Factor 3: Charging Infrastructure (Cronbach's α = 0.821)		3.94	12.31
F3a	Availability and density of public charging stations	0.856		
F3b	Range anxiety and fast-charging availability	0.832		
F3c	Home charging feasibility and installation ease	0.797		
	Factor 4: Environmental Consciousness (Cronbach's α = 0.796)		3.12	9.75
F4a	Concern about air quality and pollution in Coimbatore	0.823		
F4b	Personal environmental values and sustainability commitment	0.804		
	Factor 5: Technological Attributes (Cronbach's α = 0.778)		2.71	8.47
F5a	Battery performance, range, and longevity assurance	0.841		
F5b	Advanced tech features (connectivity, regenerative braking)	0.789		
	Factor 6: Social Influence & Brand Trust (Cronbach's α = 0.754)		2.04	5.72
F6a	Peer and family influence on EV purchase decision	0.812		

Item	Factor / Statement	Factor Loading	Eigen-value	Variance (%)
F6b	Brand reputation and after-sales service network quality	0.793		
	Total Variance Explained			68.47

6. Multiple Regression Analysis

To determine the predictive power of the six identified factors on EV purchase decision (as the dependent variable measured by overall purchase intention score), a multiple linear regression analysis was performed. Table 5 presents the regression coefficients.

Model Summary: R = 0.817, R^2 = 0.667, Adjusted R^2 = 0.661, F(6,343) = 114.27, p < 0.001

Table 5: Multiple Regression Analysis Results (N = 350)

Factor (Independent Variable)	Beta (β)	t-value	p-value	Significance
F1: Economic & Cost Benefits	0.341	7.84	0.000**	Significant
F2: Government Policy & Incentives	0.298	6.91	0.000**	Significant
F3: Charging Infrastructure	0.267	6.12	0.000**	Significant
F4: Environmental Consciousness	0.214	4.73	0.000**	Significant
F5: Technological Attributes	0.187	4.12	0.000**	Significant
F6: Social Influence & Brand Trust	0.143	3.09	0.002**	Significant

** Significant at 1% level; Dependent Variable: Overall EV Purchase Intention

The regression model is statistically significant (F=114.27, p<0.001) and explains 66.7% of the variance in EV purchase intention (R^2=0.667). All six factors are significant predictors. Economic & Cost Benefits (β=0.341) emerge as the strongest predictor, followed by Government Policy & Incentives (β=0.298), Charging Infrastructure (β=0.267), Environmental Consciousness (β=0.214), Technological Attributes (β=0.187), and Social Influence & Brand Trust (β=0.143). Accordingly, $H_0$5 is rejected, confirming that the identified factors collectively and individually predict EV purchase decisions.

Key Findings

The analysis yields the following substantive findings:

- The majority of respondents (62%) are male, reflecting existing gender gaps in vehicle ownership, though female respondents expressed comparable levels of EV interest.
- The 26–35 age group demonstrates the highest EV purchase intention, driven by environmental awareness and digital-native familiarity with technology.
- Monthly income is the strongest demographic predictor of EV purchase decision, with respondents earning above ₹30,000/month showing significantly higher purchase intentions.
- Government subsidies under FAME II and the Tamil Nadu EV Policy received the highest mean score (4.52) among all influencing factors, indicating that policy incentives are the foremost driver of EV purchase consideration in Coimbatore.
- Charging infrastructure inadequacy (mean = 4.47) and battery performance reliability (mean = 4.55) are the two highest-rated concern items, identifying critical barriers that must be addressed.
- Six factors were extracted through factor analysis: Economic & Cost Benefits, Government Policy & Incentives, Charging Infrastructure, Environmental Consciousness, Technological Attributes, and Social Influence & Brand Trust, collectively accounting for 68.47% of variance.
- Economic & Cost Benefits is the strongest regression predictor (β=0.341), confirming that

financial logic dominates EV purchase decisions in Coimbatore's middle-income market.

- Educational qualification did not show a statistically significant association with EV purchase decision, suggesting that awareness campaigns should focus on economic messaging rather than targeting specific educational groups.

VII. DISCUSSION

The findings of this study are broadly consistent with existing literature while also offering Coimbatore-specific insights. The primacy of economic factors aligns with Agarwal et al. (2020) and Verma et al. (2021), who found cost-related considerations to dominate Indian EV decision-making. However, the particularly high rating of government policy incentives in the current study (the second-strongest regression predictor) reflects the effectiveness of Tamil Nadu's proactive state-level EV policy, distinguishing the Coimbatore context from metropolitan cities where infrastructure maturity may reduce the perceived importance of policy support.

The critical concern about charging infrastructure corroborates findings by Mukherjee and Sen (2021) in Kolkata and Graham-Rowe et al. (2012) in the UK, underscoring the universality of range anxiety across geographies. In Coimbatore, where the charging network is nascent, this concern is particularly acute. The high home charging feasibility preference (54% willingness to install) suggests that incentivising home charging installations—through capital subsidies or low-interest financing—could be a high-leverage policy intervention.

The significant role of environmental consciousness, while ranked fourth in predictive power, is noteworthy given Coimbatore's historically industrial character and the associated air quality concerns. This finding suggests that local environmental communication campaigns, specifically addressing Coimbatore's air quality data, could be an effective marketing and policy communication strategy for EV promotion.

The non-significant association between educational qualification and EV purchase decision challenges the common assumption that EV adoption is primarily an educated-consumer phenomenon. This finding, unique to this study, implies that EVs in Coimbatore are perceived across educational strata as economically rational choices—particularly two-wheelers and three-wheelers—rather than as premium, technology-oriented products accessible only to highly educated consumers.

Social influence ranked sixth in predictive power but was still statistically significant, reflecting Raj and Sreejesh's (2022) observation that social networks play a meaningful role in Tier-II Indian cities. Automobile manufacturers with a strong existing dealer network in Coimbatore may leverage this channel through experiential events, test drive programmes, and EV community initiatives.

Recommendations

For Policymakers

The Government of Tamil Nadu should prioritise the rapid expansion of public EV charging infrastructure in Coimbatore, targeting residential areas, commercial zones, industrial estates, and along key arterial roads. A dedicated Coimbatore EV Charging Corridor covering NH-544 and bypass roads could significantly reduce range anxiety. Additionally, a dedicated home charging subsidy programme—offering up to ₹15,000 for home charging unit installation—would directly address the highest-rated infrastructure concern. Continued and enhanced dissemination of FAME II and state subsidy information through vernacular media (Tamil newspapers, YouTube channels, WhatsApp networks) would improve awareness, given that 27% of respondents were unaware of available incentives.

For Automobile Manufacturers

Manufacturers should focus on the 26–45 age group and middle-income segments (₹30,000–₹80,000/month) as primary target markets in Coimbatore. Product offerings should emphasise total cost of ownership communication rather than upfront price comparisons. Extended warranty packages for battery (minimum 8 years/1.6 lakh km), transparent range certifications under Indian driving

conditions, and service centre expansion in Coimbatore's peripheral areas (Ondipudur, Kuniyamuthur, Avinashi Road) are critical to building consumer trust. Manufacturers should also invest in authorised service networks, as brand reputation and after-sales service emerged as the second-most important item within the social/brand factor.

For Marketers

Marketing communication should lead with economic savings narratives—specifically the ₹3–5/km savings compared to petrol—supported by real-world testimonials from Coimbatore EV owners. Environmental messaging should be localised, referencing Coimbatore's specific air quality concerns rather than global climate change abstractions. Digital marketing through YouTube, Instagram, and WhatsApp should target the 26–35 segment, while television and print advertisements should address the 36–55 demographic. Dealer-level test drive campaigns in residential associations and corporate campuses can leverage social influence dynamics identified in the study.

VIII. CONCLUSION

This study provides a comprehensive empirical examination of the factors influencing EV purchase decisions among 350 consumers in Coimbatore. The research demonstrates that EV adoption in Coimbatore is primarily driven by economic rationality—specifically the cost advantages of EVs over conventional vehicles—strongly amplified by government policy incentives. Charging infrastructure readiness and battery technology reliability represent the most pressing barriers, while environmental consciousness, technological appeal, and social influence play meaningful but secondary roles.

The study contributes to the limited empirical literature on EV adoption in Tier-II Indian cities and offers the first factor-analytic and regression-based treatment of this topic specific to Coimbatore. The six-factor model (Economic & Cost Benefits, Government Policy & Incentives, Charging Infrastructure, Environmental Consciousness, Technological Attributes, and Social Influence & Brand Trust) provides a replicable analytical framework applicable to similar urban markets across Tamil Nadu and South India.

The findings carry actionable implications for a range of stakeholders. Policymakers must prioritise infrastructure investment and incentive communication. Manufacturers must build localised service networks and communicate long-term cost advantages. Marketers must deploy economically-grounded, locally-contextualised campaigns to drive consideration and conversion. Collectively, these strategies can accelerate the transition to sustainable mobility in Coimbatore, contributing meaningfully to India's broader EV adoption goals.

Limitations of this study include its cross-sectional design, which precludes causal inferences, and the geographic restriction to Coimbatore urban agglomeration, which limits generalisability to rural Tamil Nadu. Future research should employ longitudinal designs, incorporate post-purchase satisfaction analysis, and extend the geographic scope to other Tier-II cities in Tamil Nadu for comparative insights.

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