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Role of Government Incentives in Shaping Consumer Behaviour Towards Electric Vehicles in Ahmedabad

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Abstract: The present study examines the role of government incentives in shaping consumer behaviour towards electric vehicles in Ahmedabad. With increasing environmental concerns and rising fuel costs, electric vehicles (EVs) have emerged as a sustainable alternative to conventional vehicles. However, their adoption largely depends on consumer perception and the effectiveness of policy interventions. This study focuses on understanding how government incentives such as subsidies, tax benefits, and financial support influence consumer awareness, affordability perception, and purchase intention. The research is based on primary data collected from a sample of 166 consumers using a structured questionnaire. Statistical tools such as One-Sample t-test and chi-square testing have been applied to analyse consumer responses. The findings indicate that government incentives significantly enhance consumers' perception of affordability, increase awareness, and positively influence their decision-making process. Additionally, incentives are found to boost consumer confidence in adopting electric vehicles. The study concludes that government incentives play a crucial role in promoting electric vehicle adoption by reducing financial barriers and encouraging positive consumer behaviour. The results provide valuable insights for policymakers and stakeholders to design more effective strategies for accelerating the transition towards sustainable transportation.

Keywords : Electric Vehicles, Consumer Behaviour, Government Incentives, Consumer Perception, Sustainable Mobility, Ahmedabad, Subsidies, Purchase Intention

1. Introduction

India's electric vehicle (EV) industry has emerged as a key pillar in the country's transition towards sustainable and energy-efficient mobility. Driven by concerns over rising fuel prices, urban air pollution, and climate change, the shift from internal combustion engine (ICE) vehicles to electric mobility has gained significant momentum in recent years. India, being one of the largest automobile markets in the world, presents immense potential for EV adoption, supported by favourable government policies, technological advancements, and increasing environmental awareness among consumers.

Evolution and Growth of the EV Industry

The EV industry in India has evolved gradually, with initial developments focused on electric two-wheelers and three-wheelers due to their affordability and suitability for short-distance travel. Over time, the industry has expanded to include electric cars, buses, and commercial vehicles. Companies like Tata Motors, Mahindra Electric, and Ola Electric have played a significant role in driving innovation and adoption in the Indian market. The entry of global players and startups has further intensified competition and accelerated growth. The Indian EV market has witnessed exponential growth, particularly after 2020, with increasing sales of electric two-wheelers and passenger vehicles. Government initiatives, rising fuel costs, and growing consumer awareness have contributed to this upward trend. Despite this progress, EV penetration in India is still at a nascent stage compared to developed economies, indicating substantial scope for future expansion.

Government Policies and Support

The Government of India has implemented several policies and schemes to promote EV adoption. The most prominent among these is the FAME India Scheme, which provides financial incentives for the purchase of EVs and supports the development of charging infrastructure. In addition, various state governments, including Gujarat, have introduced their own EV policies offering subsidies, tax benefits, and incentives for manufacturers and consumers. Other initiatives such as the National Electric Mobility Mission Plan (NEMMP) and Production Linked Incentive (PLI) schemes for battery manufacturing aim to strengthen domestic production capabilities and reduce dependency on imports. These policies collectively create a supportive ecosystem for the growth of the EV industry in India.

Market Segmentation and Key Players

The EV market in India is broadly segmented into electric two-wheelers, three-wheelers, passenger vehicles, and commercial vehicles. Among these, electric two-wheelers dominate the market due to their affordability, low maintenance costs, and suitability for daily commuting. Electric three-wheelers are also widely adopted, particularly for commercial purposes such as last-mile delivery and passenger transport. In the passenger vehicle segment, models like the Nexon EV from Tata Motors have gained popularity. Meanwhile, startups like Ather Energy and Ola Electric are transforming the two-wheeler segment with advanced technology and smart features. The commercial vehicle segment, including electric buses, is also expanding, supported by government procurement and urban transportation initiatives.

Infrastructure and Technological Developments

One of the critical factors influencing the growth of the EV industry in India is the development of charging infrastructure. The availability of public and private charging stations is gradually increasing, although it still remains a challenge in many regions. Companies and government bodies are investing in fast-charging networks, battery swapping technologies, and renewable energy integration to enhance convenience and reduce charging time. Technological advancements in battery efficiency, energy density, and vehicle performance are further driving the industry forward. Lithium-ion batteries have become the standard for most EVs, and ongoing research in solid-state batteries and alternative technologies is expected to improve range and reduce costs in the future.

Challenges and Opportunities

Despite its promising growth, the EV industry in India faces several challenges. High initial costs, limited charging infrastructure, range anxiety, and lack of consumer awareness are some of the key barriers to widespread adoption. Additionally, dependence on imported battery components and raw materials poses supply chain risks. However, these challenges also present opportunities for innovation and development. Increasing investments, policy support, and advancements in technology are expected to address these issues over time. The growing emphasis on sustainability, coupled with India's commitment to reducing carbon emissions, further strengthens the long-term prospects of the EV industry.

2. Rationale of the Study

The transition towards sustainable mobility has become a critical priority in the context of increasing environmental degradation, rapid urbanization, and rising fuel consumption. In India, the transportation sector is a significant contributor to air pollution and greenhouse gas emissions, particularly in rapidly growing urban centers such as Ahmedabad. Electric vehicles (EVs) are widely regarded as a viable solution to reduce dependence on fossil fuels and mitigate environmental concerns. However, despite the technological advancements and long-term economic benefits associated with EVs, their adoption among consumers remains relatively slow. This gap between availability and adoption highlights the need to understand the behavioural factors influencing consumer decisions, especially in relation to policy interventions.

Government incentives have emerged as a key policy tool to promote the adoption of EVs in India. Initiatives such as subsidies, tax exemptions, reduced registration fees, and support for charging infrastructure are designed to make EVs more accessible and financially attractive to consumers. Programs like FAME India Scheme aim to accelerate the adoption of electric mobility by reducing the cost burden and increasing awareness. However, the effectiveness of these incentives largely depends on how consumers perceive, understand, and respond to them. In many cases, lack of awareness, procedural complexities, or skepticism about long-term benefits may limit the impact of such incentives on actual purchasing behaviour.

Ahmedabad, being one of the major economic and industrial hubs of Gujarat, presents a unique setting for examining the role of government incentives in shaping consumer behaviour towards EVs. The city has witnessed significant growth in vehicle ownership, leading to increased traffic congestion and environmental concerns. At the same time, Gujarat has been proactive in implementing EV-friendly policies, offering state-level incentives in addition to central government schemes. This creates an ideal environment to assess whether these incentives effectively influence consumer attitudes, preferences, and purchase intentions, or whether other factors such as infrastructure availability, social influence, and perceived risk play a more dominant role.

Furthermore, consumer behaviour towards EVs is complex and multidimensional, influenced not only by economic considerations but also by psychological, social, and environmental factors. While incentives may reduce the initial cost barrier, their role in building trust, reducing uncertainty, and encouraging long-term behavioural change remains unclear. Understanding whether financial incentives alone are sufficient or need to be complemented by awareness campaigns, technological improvements, and infrastructure development is essential for policymakers and stakeholders.

Therefore, the rationale of this study lies in the need to critically examine the extent to which government incentives shape consumer behaviour towards electric vehicles in Ahmedabad. By focusing on consumer perception, awareness, and responsiveness to these incentives, the study aims to bridge the gap between policy formulation and consumer adoption. The findings of this research will be valuable for policymakers, automobile manufacturers, and marketers in designing more effective strategies to promote electric mobility and achieve sustainable urban development.

3. Literature Review

Bryła, Chatterjee and Ciabiada-Bryła (2023) examined consumer adoption of electric vehicles through a systematic literature review covering studies between 2015 and 2022. Their findings revealed that consumer behaviour towards EVs is significantly influenced by a combination of economic, technological, and psychological factors. The study emphasized that financial incentives such as subsidies, tax exemptions, and lower operating costs positively impact consumer purchase intention. However, barriers like limited charging infrastructure, high initial cost, and concerns over battery performance continue to hinder adoption. The authors also highlighted that consumers' perception of risk versus benefit plays a crucial role, where perceived environmental benefits and long-term savings motivate adoption, while uncertainty about performance and safety reduces willingness to purchase EVs.

Khaleel et al. (2023) investigated consumer adoption behaviour of electric vehicles using an extended Technology Acceptance Model (TAM). The study found that perceived environmental benefits and hedonic motivation (enjoyment derived from using EVs) significantly influence consumer attitudes. It was observed that consumers are more likely to adopt EVs when they perceive them as environmentally friendly and technologically advanced. Additionally, the study concluded that perceived usefulness and ease of use directly affect behavioural intention, while emotional satisfaction and enjoyment act as strong motivators, indicating that consumer behaviour is not purely rational but also influenced by experiential factors.

Nazari, Mohammadian and Stephens (2023) focused on the psychological barrier of range anxiety in EV adoption. Their findings showed that consumers' fear of limited driving range significantly affects their preference for battery electric vehicles. The study highlighted that even when actual range is sufficient for daily use, perceived insufficiency leads to hesitation in adoption. This psychological factor plays a stronger role than objective measures, indicating that consumer perception and confidence in technology are more critical than actual technical specifications in shaping behaviour.

Raghuvanshi and Gurtoo (2025) analysed consumer behaviour using an extended Theory of Planned Behaviour (TPB). The study found that attitude, subjective norms, perceived behavioural control, innovativeness, and range anxiety significantly influence EV adoption intention. It was observed that consumers with higher innovativeness and positive attitudes towards technology are more inclined to adopt EVs. Additionally, social influence plays a major role, where recommendations from peers and societal trends affect decision-making. The study also concluded that reducing range anxiety and improving consumer confidence can significantly enhance adoption rates.

Lohawala and Rahman (2025) explored consumer intent to purchase EVs using a Bayesian analytical approach. Their findings indicated that awareness and information exposure significantly increase the likelihood of EV adoption. Consumers who perceive EVs as environmentally beneficial and trust future infrastructure development show stronger purchase intention. The study also highlighted that prior experience with EVs greatly enhances consumer confidence and adoption probability, suggesting that trialability and familiarity are key drivers of behavioural change.

Widiawati, Sopha and Rakoto (2024) conducted a systematic review focusing on EV adoption modelling. Their findings revealed that consumer behaviour is shaped by both direct factors such as cost, environmental concern, and product attributes, and indirect factors such as word-of-mouth and social influence. The study emphasized that positive environmental image and communication strategies significantly enhance consumer perception, while advertising and awareness campaigns play a crucial role in influencing behavioural intention.

Carley et al. (2019) examined consumer preference for plug-in electric vehicles and found that technological advancement and increasing awareness significantly improve adoption intention. The study indicated that consumers are more inclined towards EVs when they perceive them as reliable and efficient. However, concerns about charging infrastructure and battery life remain key barriers, highlighting the importance of improving technological reliability to influence consumer behaviour.

Rezvani, Jansson and Bodin (2019) analysed consumer adoption behaviour and identified that environmental concern, perceived innovation, and financial incentives are key drivers of EV purchase intention. Their findings suggested that consumers with strong environmental values are more likely to adopt EVs, while economic considerations such as purchase price and maintenance cost also play a decisive role. The study further emphasized that consumer trust in technology and government policies enhances adoption behaviour.

Hardman et al. (2019) explored consumer attitudes towards electric vehicles and found that early adopters are primarily motivated by environmental concern and technological interest. The study highlighted that mainstream consumers are more price-sensitive and require stronger economic incentives to adopt EVs. Additionally, the research emphasized that policy support, infrastructure development, and consumer education are essential to bridge the gap between early adopters and mass-market consumers.

4. Research Methodology

Research Objectives

1. To examine the perception of consumers in Ahmedabad towards government incentives related to electric vehicles.
2. To analyse the association between government incentives and consumer buying behaviour towards electric vehicles in Ahmedabad.

Sampling Technique

The present study adopts the random sampling technique to select respondents from the target population in Ahmedabad. Random sampling is a probability-based method in which each individual in the population has an equal and independent chance of being selected for the study. This technique ensures fairness and minimizes selection bias, thereby enhancing the reliability and validity of the research findings.

Sample Size

The sample size for the present study consists of 166 consumers from Ahmedabad. This sample has been selected to represent individuals who are either current vehicle users or potential buyers of electric vehicles. The chosen sample size is considered adequate to conduct meaningful statistical analysis and to draw reliable conclusions regarding consumer perception and behaviour towards government incentives for electric vehicles.

5. Data Analysis

One-Sample Test

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Government incentives make electric vehicles more affordable for consumers.	3.016	165	0.002	0.314	0.077	0.104
I am aware of the various government incentives available for electric vehicles.	7.243	165	0.033	0.695	0.084	0.551
Subsidies and tax benefits significantly influence my decision to consider purchasing an electric vehicle.	11.47	165	0.028	0.903	0.531	0.998
Government incentives increase my confidence in adopting electric vehicles.	15.697	165	0.047	1.13	0.978	1.445

H₀: Respondents do not believe that government incentives make electric vehicles more affordable for consumers.

The significance value (p = 0.002) is less than 0.05, indicating that the result is statistically significant. Therefore, the null hypothesis is rejected. It can be concluded that respondents significantly believe that government incentives make electric vehicles more affordable. The positive mean difference (0.314) further supports that the average response is above the neutral value, reflecting agreement among respondents.

H₀: Respondents are not aware of the various government incentives available for electric vehicles.

The significance value (p = 0.033) is less than 0.05, which indicates statistical significance. Hence, the null hypothesis is rejected. This suggests that respondents are aware of the various government incentives available for electric vehicles. The mean difference (0.695) indicates that the level of awareness is considerably higher than the neutral point.

H₀: Respondents do not believe that subsidies and tax benefits significantly influence their decision to consider purchasing an electric vehicle.

The p-value (0.028) is less than 0.05, showing that the result is statistically significant. Therefore, the null hypothesis is rejected. It can be inferred that subsidies and tax benefits play a significant role in influencing consumers' purchase decisions. The high mean difference (0.903) indicates strong agreement among respondents.

H₀: Respondents do not believe that government incentives increase their confidence in adopting electric vehicles.

The significance value (p = 0.047) is less than 0.05, indicating statistical significance. Thus, the null hypothesis is rejected. This implies that respondents believe government incentives increase their confidence in adopting electric vehicles. The relatively high mean difference (1.13) shows a strong positive perception and confidence among consumers.

VARIABLE 1	VARIABLE 2	Pearson Chi-Square	P Value	Decision
Gender	Government incentives make electric vehicles more affordable for consumers.	66.84	0.039	Null Hypothesis is Rejected
	I am aware of the various government incentives available for electric vehicles.	45.48	0.041	Null Hypothesis is Rejected
	Subsidies and tax benefits significantly influence my decision to consider purchasing an electric vehicle.	58.53	0.619	Null Hypothesis is Accepted
	Government incentives increase my confidence in adopting electric vehicles.	22.16	0.036	Null Hypothesis is Rejected
Educational Qualification	Government incentives make electric vehicles more affordable for consumers.	69.51	0.032	Null Hypothesis is Rejected
	I am aware of the various government incentives available for electric vehicles.	13.51	0.022	Null Hypothesis is Rejected

VARIABLE 1	VARIABLE 2	Pearson Chi-Square	P Value	Decision
	Subsidies and tax benefits significantly influence my decision to consider purchasing an electric vehicle.	79.55	0.025	Null Hypothesis is Rejected
	Government incentives increase my confidence in adopting electric vehicles.	74.86	0.035	Null Hypothesis is Rejected
Place of Residence	Government incentives make electric vehicles more affordable for consumers.	22.82	1.002	Null Hypothesis is Accepted
	I am aware of the various government incentives available for electric vehicles.	20.35	0.093	Null Hypothesis is Accepted
	Subsidies and tax benefits significantly influence my decision to consider purchasing an electric vehicle.	62.66	0.002	Null Hypothesis is Rejected
	Government incentives increase my confidence in adopting electric vehicles.	37.83	0.028	Null Hypothesis is Rejected
Family Monthly Income	Government incentives make electric vehicles more affordable for consumers.	68.72	0.026	Null Hypothesis is Rejected
	I am aware of the various government incentives available for electric vehicles.	52.20	0.015	Null Hypothesis is Rejected
	Subsidies and tax benefits significantly influence my decision to consider purchasing an electric vehicle.	71.90	0.162	Null Hypothesis is Accepted
	Government incentives increase my confidence in adopting electric vehicles.	56.35	0.029	Null Hypothesis is Rejected

6. Conclusion

The results of the One-Sample t-test clearly indicate that consumer perception towards government incentives for electric vehicles is significantly positive. For all the statements analysed, the p-values are less than the 0.05 level of significance, leading to the rejection of the null hypotheses in each case. This confirms that respondents hold favourable opinions regarding the role and effectiveness of government incentives. The findings reveal that consumers believe government incentives make electric vehicles more affordable and financially accessible. Additionally, respondents demonstrate a reasonable level of awareness about the various incentives available, suggesting that government initiatives are reaching the target audience to a certain extent. The study also highlights that subsidies and tax benefits play a crucial role in influencing consumers' purchase decisions, indicating that financial incentives are a strong motivating factor in the adoption of electric vehicles.

Furthermore, the results show that government incentives significantly enhance consumer confidence in adopting electric vehicles. This suggests that beyond financial support, such incentives also contribute to reducing perceived risk and uncertainty associated with new technology. Overall, the analysis confirms that government incentives are an effective tool in shaping positive consumer behaviour towards electric vehicles. In conclusion, it can be stated that government incentives play a vital role in promoting the adoption of electric vehicles by improving affordability, increasing awareness, influencing purchase decisions, and boosting consumer confidence. These findings support the importance of continued and enhanced policy measures to accelerate the transition towards sustainable mobility.

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