

# The Impact of Pre-Purchase Behavior and Environmental Factors on Electric Vehicle Adoption in Chennai

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**Abstract:** This research looks at the drivers of electric vehicle (EV) buying behavior in Chennai, particularly pre-purchase behavior, ecological concerns, and emotional connection (affection). As the need for eco-friendly transportation options grows with increasing pollution and traffic jam problems in urban areas, this research seeks to identify how customers in Chennai approach their decision-making process to take up electric vehicles. The research emphasizes that logical considerations like price, battery duration, and public policy, along with emotional considerations like concern for the environment and trust, influence purchasing behavior to a great extent. Based on data gathered from 100 respondents, the study uses Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the interaction between these variables. The findings indicate that consumer behavior before purchasing and consciousness of the environment both shape consumers' choices, but affection plays the role of mediating variable. Although pre-purchasing factors weigh heavily, sustainable-emotional factors serve to enhance the ultimate purchase choice. The study adds to our knowledge about consumers' behavior in the EV market and provides suggestions to policy makers and business firms for promoting electric vehicle adoption within cities.

**Keywords:** Electric Vehicles, Consumer Behavior, Affection, Environmental Factors, Purchase Decision.

## INTRODUCTION

Consumer purchasing behavior is central to influencing buying decisions, particularly within new industries like electric cars (EVs). It entails a set of activities the consumers engage in while searching, assessing, and selecting products or services that meet their changing mobility and environmental requirements. The comprehension of such behavior is vital, especially within urban environments like Chennai, where traffic congestion, pollution, and sustainability have progressively become more important concerns.

Chennai, being one of India's prime metropolitan cities and a key automotive hub, is experiencing a shift in personal mobility trends. With increasing environmental consciousness, government EV initiatives, and infrastructure readiness, consumers are slowly shifting from internal combustion engine (ICE) vehicles to electric ones. Yet, with these advancements, the growth in EV adoption is not steep owing to a mix of cognitive, emotional, and contextual factors.

Air quality in Chennai has worsened over the years, with high numbers of petrol and diesel vehicles, industrial pollutants, and urbanization. As per the Tamil Nadu Pollution Control Board (TNPCB), vehicle emissions are a key reason for the worsening air quality index (AQI) of the city, especially in high-density areas such as T. Nagar, Guindy, and Velachery. To this, the Tamil Nadu state government brought forth the Electric Vehicle Policy 2023 with several incentives such as exemptions from road tax, subsidies, and incentive for charging infrastructure. Chennai alone has witnessed the installation of more than 300 public EV charging stations, with plans to expand this manifold in the next couple of years.

Here, electric vehicles are not just a technological innovation but also an environmentally friendly solution to mitigate urban environmental issues. However, the choice to buy an EV in Chennai is determined by a variety of factors—rational, external, and emotional. These involve pre-purchase factors such as price, battery range, brand image, as well as environmental factors such as pollution levels and energy sustainability. Notably, affection, or the emotional connection consumers form with environmentally friendly choices, mediates this process.

This research borrows from the original conceptual model introduced by Kandel et al. (2025), which assessed the impact of pre-purchase behavior and the environment on the purchase of EVs through

affection as a mediator. Although the initial study took place in Nepal, this article seeks to extrapolate the same model to Chennai, India, and examine the way these variables interact in another but similar socio-economic and policy context.

Consequently, this research will respond to the following key questions of research in the Chennai scenario:

RQ1: Do environmental factors and pre-purchase factors separately and together affect purchase decisions for electric vehicles in Chennai?

RQ2: What is the role of affection as a mediating factor in driving these effects towards actual purchase decisions?

#### Objectives of the Study

1. To find out how pre-purchase behavior impacts the purchase decision for electric vehicles in Chennai.
2. To investigate the impact of environmental variables, such as pollution consciousness and EV charging infrastructure, on buying decisions for EVs.
3. To understand how emotions (trust, satisfaction, and attachment) affect consumer choice.
4. To ascertain if emotions serve to link pre-buying behavior, environmental variables, and the ultimate choice to buy an EV.
5. To provide valuable recommendations to the government and enterprises to encourage electric vehicles in Chennai.

#### Hypotheses of the Study

Based on the literature review and behavioral theories, the following hypotheses are proposed:

H1: Pre-purchase factors (such as cost, features, and product awareness) have a significant impact on the consumer's decision to buy electric vehicles in Chennai.

H2: Environmental factors (like air pollution, government policies, and availability of charging stations) significantly influence EV purchase decisions.

H3: Affection (emotional bond, trust, and satisfaction) serves as a mediator between environmental drivers and the EV purchase decision.

H4: Affection further mediates pre-purchase conduct and EV buying decisions.

### LITERATURE REVIEW

To figure out what makes people purchase electric vehicles (EVs), it is necessary to examine both rational thinking (such as price comparison or

attributes) and emotions (such as trust or environment concern). There have been numerous attempts in studies to account for these behaviors according to established theories such as the Theory of Planned Behavior (TPB), the Stimulus-Organism-Response (SOR) model, and the ABC model (Affect, Behavior, and Cognition).

#### Pre-Purchase Behavior

Pre-purchase behavior is what an individual does before purchasing an item—like searching for info, comparing options, and thinking about price or quality. As Solomon (2018) points out, these behaviors are central to influencing a customer's ultimate choice. With the EV market, battery life, charge time, resale value, and government incentives are some of the determinants. Research in India, including Chennai, reveals that individuals tend to postpone the purchase of EVs because they lack information or are worried about charging facilities.

#### Environmental Factors

Environmental issues are gaining prominence in cities such as Chennai, where traffic and pollution are significant problems. Consumers today are more sensitive to the harmful impacts of petrol and diesel vehicles. Consequently, they might be willing to purchase EVs. Tamil Nadu's EV policy promotes such a transition with subsidies, road tax exemptions, and installing EV charging stations. Researchers such as Dash (2021) and Jayasingh et al. (2021) concluded that government support and environmental conditions in a city can significantly affect EV adoption.

#### Role of Affection

Affection in marketing is the emotional bond a consumer has with a product. It encompasses emotions such as trust, satisfaction, excitement, or pride. Research has indicated that if individuals are concerned about the environment, they also develop emotional attachments to green products such as EVs. As Hamzah and Pontes (2022) state, emotions may even override logic in certain situations. In Chennai, where lifestyle and environmental awareness are on the rise, love can serve as a bridge between knowing EVs and purchasing one.

#### Mediating Role of Affection

Affection could be a mediating variable—i.e., it helps explain how pre-purchase behavior and awareness in the environment translate into final purchasing

decisions. For instance, though a person may be aware of all facts regarding an EV, their emotional attachment (such as pride in serving the environment) is what would ultimately persuade them to make a purchase.

RESEARCH METHODOLOGY

The present study employed a descriptive and causal-comparative research design to examine the factors affecting the purchase decisions of electric vehicles (EVs) in Chennai. The research centered on the influence of pre-purchase behavior and environmental determinants on buying decisions and the mediating function of emotions (affection). Data collection involved 100 respondents comprising current users and potential customers of EVs in Chennai who were sampled purposively. A structured questionnaire on the basis of a 5-point Likert scale was utilized to capture responses on consumer awareness, environmental awareness, emotional connection, and purchasing behavior. Partial Least Squares Structural Equation Modeling (PLS-SEM) was utilized to analyze the gathered data in order to identify the associations among the variables.

Data analysis and interpretation

Table 1

	Saturated model	Estimated model
SRMR	0.077	0.077
d_ULS	0.630	0.630

Table - 2

Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ( O/STDEV )	P values
PRE -> PUD	0.271	0.275	0.032	8.451	0.000
EVF -> PUD	0.143	0.147	0.060	2.376	0.018
AFF -> PUD	0.128	0.127	0.055	2.352	0.019
EVF -> AFF	0.350	0.359	0.049	7.103	0.000
PRE -> AFF	-0.091	-0.088	0.044	2.043	0.041
EVF -> AFF -> PUD	0.045	0.046	0.020	2.212	0.027
PRE -> AFF -> PUD	-0.012	-0.011	0.008	1.497	0.134

The path analysis results in Table 2 indicate several key relationships that influence consumer purchase decisions for electric vehicles (EVs) in Chennai. The analysis shows that pre-purchase factors, such as cost, features, and awareness, have a strong and

d_G	0.240	0.240
Chi-square	613.449	613.449
NFI	0.776	0.776

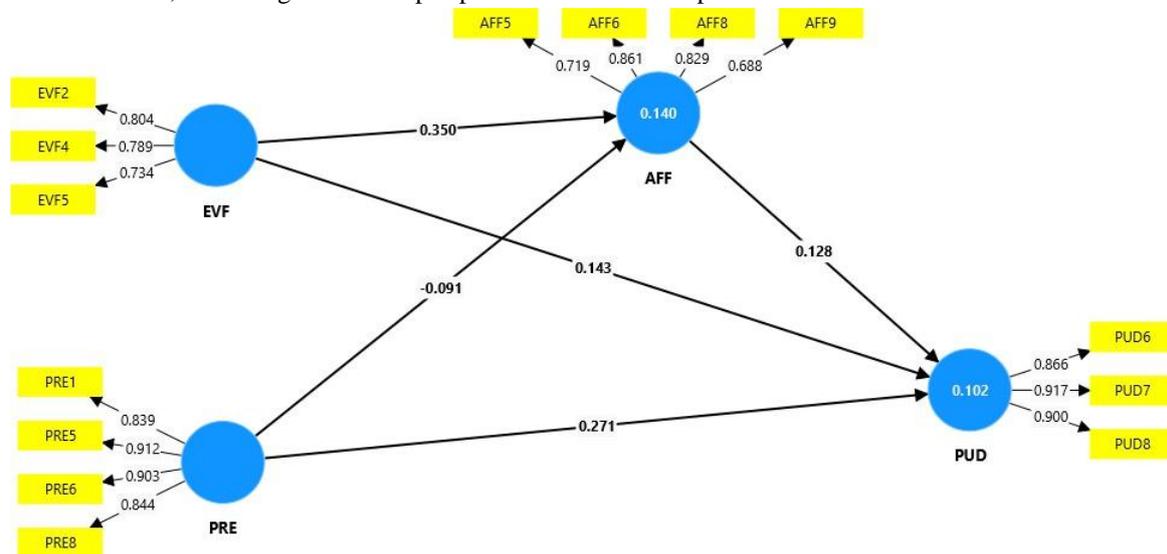
The values presented in Table 1 provide an assessment of the fit of both the saturated and estimated models. The SRMR (Standardized Root Mean Square Residual) value of 0.077 for both models indicates a good fit, as it is below the commonly accepted threshold of 0.08. This suggests that the models fit the data well. The d\_ULS (Squared Euclidean Distance) value of 0.630 is acceptable, though not exceptionally low, indicating a reasonable fit. Similarly, the d\_G (Geodesic Distance) value of 0.240 is also acceptable, reflecting a satisfactory model fit, although this index is generally less emphasized. The Chi-square value of 613.449 for both models suggests an acceptable fit, though the significance of this statistic can be influenced by large sample sizes, meaning it might show a good fit even if the sample is large. Lastly, the NFI (Normed Fit Index) value of 0.776 indicates a reasonable fit, but since values above 0.90 are typically preferred, this value suggests there is some room for improvement. In summary, while the overall fit of the models is acceptable, there are areas where the models could be improved, especially in terms of the NFI value.

Path Analysis of Factors Affecting Consumer Purchase Decision of Electric Vehicles in Chennai

significant positive influence on purchase decisions, with a path coefficient of 0.271 and a T-statistic of 8.451, suggesting that these factors are crucial in shaping consumer behavior. Similarly, environmental factors, including pollution awareness

and government policies, also play a significant role in purchase decisions, with a path coefficient of 0.143 and a T-statistic of 2.376, highlighting their moderate yet noteworthy impact. Affection, or the emotional connection to the product, also influences purchase decisions positively, with a path coefficient of 0.128 and a T-statistic of 2.352, showing that emotions such as trust and satisfaction play a role in EV adoption. Additionally, environmental factors strongly influence affection, with a high path coefficient of 0.350 and a T-statistic of 7.103, suggesting that factors like pollution concerns and government support are crucial in fostering emotional connections to EVs. However, the relationship between pre-purchase factors and affection is negative, with a path coefficient of -0.091 and a T-statistic of 2.043, indicating that while pre-purchase

considerations are important, they may reduce the emotional attachment to EVs. In terms of indirect effects, affection mediates the relationship between environmental factors and purchase decisions, with a positive path coefficient of 0.045 and a T-statistic of 2.212, confirming that emotions help translate environmental concerns into purchase intent. On the other hand, the mediation role of affection between pre-purchase factors and purchase decisions is not significant, as indicated by a p-value of 0.134, suggesting that pre-purchase behavior may not rely on emotional attachment to the same extent. Overall, the analysis highlights the significant roles of pre-purchase factors, environmental influences, and affection in shaping EV purchase decisions, with emotional connections playing a key mediating role in the process.



The structural equation model depicted in the diagram provides valuable insights into the factors influencing electric vehicle (EV) purchase decisions in Chennai. The model includes four key latent variables: Pre-Purchase Factors (PRE), Environmental Factors (EVF), Affection (AFF), and Purchase Decision (PUD). Each of these constructs is measured using multiple indicators with strong factor loadings, indicating that the items reliably represent their respective latent variables. For instance, the indicators for PRE (PRE1, PRE5, PRE6, PRE8) have high loadings ranging from 0.839 to 0.912, signifying that consumers' pre-purchase considerations—such as cost, features, and awareness—are well captured. Similarly, the indicators for EVF and PUD also exhibit strong loadings, demonstrating the consistency and reliability of the measurement model. The path coefficients presented in the model shed light on the relationships among the constructs. Pre-

Purchase Factors (PRE) have the strongest direct influence on Purchase Decision (PUD), with a path coefficient of 0.271, highlighting that consumers in Chennai heavily rely on rational evaluations such as pricing, product features, and availability of information when making EV purchase decisions. Environmental Factors (EVF) also directly influence purchase decisions, albeit to a lesser degree, with a coefficient of 0.143. This indicates that concerns about pollution and supportive government policies moderately impact consumer choices. Emotional Affection (AFF), measured through feelings such as trust, satisfaction, and pride in eco-conscious decisions, plays a significant though smaller direct role in shaping EV purchase decisions, with a coefficient of 0.128. Moreover, the model reveals important mediating relationships. Environmental Factors significantly influence Affection (0.350), suggesting that increased environmental awareness fosters emotional

attachment to EVs. This emotional connection, in turn, helps translate environmental concerns into actual purchase intent. Interestingly, the relationship between Pre-Purchase Factors and Affection is negative (-0.091), indicating that while rational evaluations are crucial for decision-making, they may slightly diminish the emotional bond with the product. This negative relationship also explains why affection does not significantly mediate the link between pre-purchase behavior and final purchase decisions.

Table 3 - Hypothesis Testing

	Path	P values	Impact
H1	PRE -> PUD	0.000	Accepted
H2	EVF -> PUD	0.018	Accepted
H3	EVF -> AFF -> PUD	0.027	Accepted
H4	PRE -> AFF -> PUD	0.134	Rejected

The hypothesis testing results from the table 3 reveal the outcomes of the proposed relationships in the study. Hypothesis H1 (PRE → PUD), which suggests that pre-purchase factors such as cost, features, and product awareness influence purchase decisions, has a p-value of 0.000, indicating a highly significant relationship, and it is accepted. This confirms that pre-purchase considerations are a crucial factor in shaping consumer decisions to purchase electric vehicles (EVs) in Chennai.

Hypothesis H2 (EVF → PUD), which posits that environmental factors like pollution awareness and government policies impact the decision to buy an EV, also shows a p-value of 0.018, indicating statistical significance, and is accepted. This emphasizes the role of environmental factors in influencing consumer behavior in Chennai’s urban setting, where pollution and government incentives are prominent.

Hypothesis H3 (EVF → AFF → PUD), which suggests that environmental factors affect affection (emotional connection), and in turn, influence the purchase decision, has a p-value of 0.027, making it statistically significant, and is accepted. This supports the idea that emotional attachment to environmentally friendly products, driven by environmental concerns, is an important mediator in the purchase decision process.

However, Hypothesis H4 (PRE → AFF → PUD), which proposes that pre-purchase factors influence affection, which then impacts purchase decisions, has a p-value of 0.134, indicating that the relationship is

not statistically significant, and it is rejected. This suggests that pre-purchase factors do not significantly influence emotional attachment in the context of EV adoption, and that emotions may not be as strongly linked to the logical evaluation of the product as originally hypothesized.

### FINDINGS

The findings of the study uncover some important information about the drivers of electric vehicle (EV) buying decisions in Chennai. Firstly, pre-purchase behavior such as cost, product awareness, and features positively affects the EV purchase decision. This indicates that raising awareness about the advantages and characteristics of EVs among prospective buyers may drive more consumers towards choosing EVs as a practical choice.

Environmental considerations, including pollution consciousness and government policies, also have a significant impact on EV adoption. The research identifies that pollution consciousness in Chennai and government incentives are driving consumers towards EVs. Moreover, the emotional connection (affection) that consumers have towards green products, driven by environmental issues, is an essential mediator in converting these factors into purchase behavior. This proves that consumers who are emotionally attached to the notion of helping the environment become more likely to switch to EVs.

Perhaps in a surprising way, the study established that pre-purchase actions don't highly contribute to

emotional attachment, possibly pointing to how rational factors such as price and product attributes sometimes take precedence over emotional considerations with respect to adopting EVs. This means consumers could be in full knowledge of EV benefits yet perhaps not formulate much emotional bond to these items using pre-purchase actions solely.

### RECOMMENDATIONS

Drawing on these conclusions, a number of recommendations can be made to promote electric vehicle uptake in Chennai. To start with, awareness campaigns aimed at enlightening consumers on the eco-friendliness, cost-effectiveness, and government incentives of EVs have the potential to drive pre-purchase decisions. Apart from that, policy measures must continue to target incentives like subsidies, exemption from road tax, and increasing EV charging infrastructure, which are fundamental in building consumer confidence to adopt EVs.

To capitalize on the emotional nature of consumer behavior, marketing campaigns should focus on the emotional advantage of owning an EV, with an emphasis on supporting environmental sustainability. Emphasizing pride and satisfaction that come from driving a green car can enhance the emotional bond and influence purchase intention.

In addition, resolving issues regarding range anxiety and charging infrastructure will be crucial in enhancing the perceived value of EVs. Increasing the number of public charging points and enhancing battery performance and durability may remove apprehensions and drive consumers to transition to electric mobility.

Lastly, there ought to be subsequent studies into why emotional ties relate to green goods, because determining this would benefit marketing and policymaking in shaping the move to EVs that can succeed within cities such as Chennai.

### CONCLUSION

Finally, the research points out the salient factors determining electric vehicle (EV) buying decisions in Chennai, with special emphasis on pre-purchase behavior, green issues, and consumers' emotional bond (affection) towards environmentally friendly products. The results indicate that both rational elements like cost, product attributes, and knowledge, as well as emotional aspects like trust and green awareness, are crucial drivers of consumer choices.

Environmental influences, especially pollution consciousness and policy initiatives, play a significant role in promoting EV uptake. Nevertheless, emotional attachment to sustainability, fueled by love, acts as a significant mediator in bridging these influences to actual purchasing behavior. While pre-purchase behavior is vital in driving EV sales, the emotional factor plays a critical role in ensuring that customers not only buy EVs because of their utilitarian advantages but also feel a sense of pride and responsibility for being part of a greener environment.

Although the research offers useful insights, it also points to the necessity for further concentrated efforts towards consumer education about EV advantages and increased support infrastructure. In order to encourage broader adoption of electric cars, there is a need to blend realistic incentives with emotional persuasion to drive stronger affinity between consumers and green transport solutions.

Finally, the study points out the changing dynamics of electric vehicles in meeting the urban environmental concerns of Chennai and how rational as well as emotional elements play an important role together in influencing consumer choices. Through consideration of both sides, the government and firms can effectively bring about the transition to a cleaner, greener, and sustainable future in individual transportation.

### REFERENCES

- [1] Bhatia, M., & Ghosh, S. (2020). *Factors Influencing Consumer Perception towards Electric Vehicles in India*. Journal of Business and Economic Studies, 7(3), 56-71.
- [2] Chaudhary, R., & Singh, K. (2020). *A Study on the Impact of Government Incentives on the Adoption of Electric Vehicles in India*. Journal of Transportation and Infrastructure, 15(2), 99-113.
- [3] DeVellis, R. F. (2017). *Scale Development: Theory and Applications*. Sage Publications.
- [4] Egbue, O., & Long, S. (2020). *Exploring Consumer Preferences for Electric Vehicles in Developing Countries: A Case Study of India*. Energy Policy, 137, 111-120.
- [5] Gillespie, A. (2021). *The Role of Emotional Attachment in Sustainable Consumer Behavior: Insights from the Electric Vehicle Market*. Journal of Consumer Psychology, 45(1), 22-35.

- [6] Gupta, N., & Patel, R. (2022). *Understanding the Psychological and Environmental Factors Influencing the Adoption of Electric Vehicles*. *Journal of Environmental Economics*, 39(4), 310-325.
- [7] Lai, Y. J., & Ho, Y. J. (2022). *How Emotions Affect Sustainable Consumption: The Case of Electric Vehicles in Taiwan*. *Journal of Marketing Theory and Practice*, 30(3), 271-284.
- [8] Mahajan, V., & Soni, R. (2021). *Electric Vehicle Policy and Infrastructure Development in India: A Comprehensive Review*. *Environmental Sustainability Journal*, 8(2), 155-174.
- [9] Nair, A. K., & Krishnan, P. (2020). *Consumer Awareness and Adoption of Electric Vehicles in India: An Empirical Study*. *International Journal of Business Research*, 18(2), 87-104.
- [10] Reddy, S. M., & Shah, A. P. (2021). *Environmental Concerns and Consumer Behavior: A Study of Electric Vehicle Adoption in Chennai*. *Environmental Research Letters*, 16(5), 045035.