A Study on Customer Perception Towards E- Vehicle Specific for Two-Wheeler in Meerut Region

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Abstract

The adoption of electric vehicles (EVs) represents a significant shift in consumer behavior and environmental consciousness. This research investigates the customer perception towards electric two-wheelers in the Meerut region of India. The study employs a questionnaire approach to collect the qualitative data to gather comprehensive insights from the 100 participants with the various demographic variables. Key factors influencing consumer perceptions such as cost, performance, charging infrastructure, and environmental impact are examined. Findings reveal nuanced attitudes among consumers, highlighting concerns about range anxiety, affordability, and perceptions of EV reliability. The study underscores the importance of infrastructure development and policy support in enhancing consumer confidence and promoting the uptake of electric two-wheelers. This research contributes valuable insights for industry stakeholders, policymakers, and marketers aiming to foster sustainable mobility solutions in urban settings.

Keywords: *Electric vehicles, customer perception, two-wheelers, sustainability.*

1. Introduction

The global automotive industry is witnessing a transformative shift towards sustainable mobility solutions, driven by the urgent need to mitigate environmental impact and reduce dependence on fossil fuels. In this context, electric vehicles (Evs) have emerged as a promising alternative, offering reduced emissions and operational costs compared to traditional internal combustion engine vehicles. Among the various categories of Evs, electric two-wheelers have garnered significant attention for their potential to revolutionize urban transportation, particularly in densely populated regions like Meerut.

The city of Meerut, located in the northern Indian state of Uttar Pradesh, faces mounting challenges related to air pollution and traffic congestion, necessitating sustainable transport alternatives. Electric two-wheelers present a viable solution, offering commuters a cleaner and more cost-effective mode of travel. However, the widespread adoption of Evs, including electric two-wheelers, hinges not only on technological advancements and regulatory support but also on consumer acceptance and perception.

Understanding consumer perception towards electric two-wheelers in Meerut is crucial for stakeholders including manufacturers, policymakers, and urban planners. This study aims to delve into the factors

influencing customer perceptions and attitudes towards electric two-wheelers in the Meerut region. By exploring variables such as cost-effectiveness, performance, charging infrastructure, range anxiety, and environmental impact, this research seeks to provide insights that can inform strategies for promoting EV adoption and sustainable urban mobility practices.

Through a combination of quantitative surveys and qualitative interviews, this research will capture a nuanced understanding of how residents of Meerut perceive electric two-wheelers, identifying barriers to adoption and opportunities for enhancement. By shedding light on consumer preferences and concerns, this study aims to contribute valuable insights that can guide the development of policies, marketing strategies, and infrastructure investments aimed at accelerating the uptake of electric two-wheelers in Meerut and beyond.

1.1. About the two-wheeler E-Vehicle industry in India

The two-wheeler electric vehicle (EV) industry in India has been gaining momentum in recent years, driven by a combination of environmental awareness, government incentives, technological advancements, and changing consumer preferences. Here are some key insights about the industry:

1. **Market Growth**: The market for electric two-wheelers in India has been expanding rapidly. Factors such as rising fuel prices, increasing urbanization, and concerns over air pollution have fueled demand for cleaner and more affordable transportation alternatives.
2. **Government Support**: The Indian government has implemented various policies and incentives to promote electric vehicles, including two-wheelers. These include subsidies, tax benefits, and initiatives like the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme, which provides financial support for EV adoption.
3. **Technological Advancements**: Advances in battery technology, particularly the shift towards lithium-ion batteries, have improved the performance, range, and affordability of electric two-wheelers. This has made them more competitive with conventional petrol-powered vehicles.
4. **Emerging Players**: Several domestic and international manufacturers have entered the Indian electric two-wheeler market, offering a diverse range of products to cater to different consumer segments. This includes startups focused on innovation in design, connectivity, and battery management systems.
5. **Consumer Adoption**: Consumer attitudes towards electric two-wheelers are evolving. While initial concerns such as range anxiety and charging infrastructure remain, awareness about the benefits of Evs—such as lower operating costs and reduced maintenance—has been growing.
6. **Challenges**: Despite the growth prospects, the industry faces challenges such as the need for robust charging infrastructure, high upfront costs compared to conventional vehicles, and the need for better consumer education and awareness about Evs.
7. **Urban Mobility Solutions**: Electric two-wheelers are seen as effective solutions for urban mobility, particularly in congested cities where they offer advantages like manoeuvrability, ease of parking, and reduced emissions.
8. **Future Outlook**: The outlook for the electric two-wheeler industry in India is optimistic, with projections of continued growth supported by ongoing technological advancements, government policies, and increasing consumer acceptance. Continued investment in infrastructure, research, and development is expected to further accelerate the adoption of electric two-wheelers across the country.

The electric two-wheeler industry in India represents a dynamic and promising sector within the broader EV landscape, poised to play a significant role in shaping the future of sustainable mobility in urban and peri-urban areas.

2. Literature Reviews:

There are some literature reviews related to the perception of consumers towards E-Vehicle (two wheelers) by different researchers as follows:

Jayasingh, S., Girija, T., & Arunkumar, S. (2021) This study identifies key factors affecting consumers' purchase intentions for electric two-wheelers, including environmental concerns, cost efficiency, and technological advancements. The authors emphasize the importance of government incentives and infrastructure development in promoting e-vehicle adoption.

Pyakurel, B., Thapa, B. S., & Nepal, S. R. (2025) This research examines consumer purchase intentions in Kathmandu Valley, highlighting environmental concerns, perceived economic benefits, social influence, and charging infrastructure as significant factors. The study suggests that addressing high initial costs and improving charging facilities can enhance e-bike adoption.

Sreeja, O. K., & Vennila Shree, S. (2024) Focusing on Calicut City, this study analyzes customer preferences and satisfaction levels regarding electric two-wheelers. It finds a strong positive correlation between vehicle price and purchase intention, and emphasizes the role of charging infrastructure availability in shaping customer satisfaction.

Sankar, D. J. G., & Kumar, G. H. (2020) This paper investigates factors influencing customer perception of electric two-wheeler innovations, identifying charging time, limited model availability, travel distance per charge, and environmental concerns as key considerations affecting consumer attitudes.

Inumarthi, S., & Ram Kishen, Y. (2023) This study explores the primary factors influencing customer adoption of electric two-wheelers in India, highlighting environmental awareness, cost considerations, and performance expectations. The authors suggest that targeted marketing strategies and policy support are crucial for increasing adoption rates.

3. Research Methodology

This study employs a descriptive and analytical approach to investigate customer perceptions towards electric two-wheelers specifically in the Meerut region of Uttar Pradesh, India. The primary data collection method involved the distribution of a structured questionnaire administered through Google Forms. A convenience sampling technique was utilized to select 100 participants from Meerut, ensuring representation across different demographics and socio-economic backgrounds within the city.

Data analysis will involve descriptive statistics to summarize participant demographics and perceptions, as well as analytical techniques such as graphical representation and interpretation. The findings will be interpreted to identify trends, patterns, and significant factors influencing customer perceptions towards electric two-wheelers in Meerut.

This research methodology ensures a comprehensive exploration of consumer attitudes and preferences towards electric mobility solutions in a specific urban context, offering insights that can inform policy-making, marketing strategies, and infrastructure development aimed at promoting sustainable transportation options in Meerut and similar urban areas.

4. Objectives of the study

- To know the market, share of E-vehicle and petrol two-wheelers in Meerut region.
- To know about the ranking of factors as per customer perception towards two-wheeler purchasing.
- To know the customer perception towards the purchase of two-wheeler E-vehicle.

5. Data Analysis and Interpretation

From the collected data through questionnaire, we divided it into two parts: (a) demographic data (b) Psychographic Analysis.

(a) Demographic Data:

For completion this research demographic data is must for the analysis to test the hypothesis. There are various demographic variables taken into consideration like age, gender,

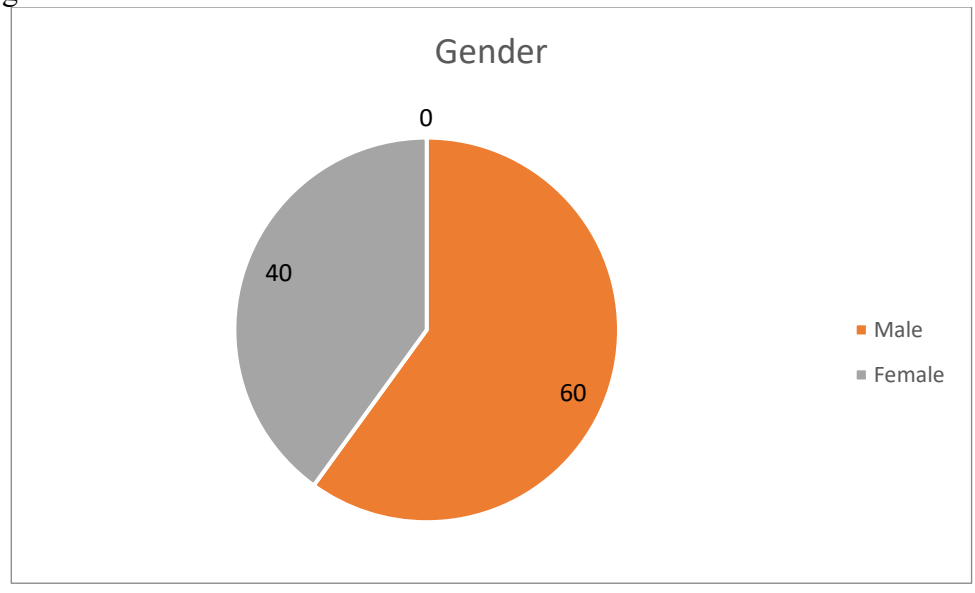
i.Gender:

Table:5.1: Gender wise distribution of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	60	60.0	60.0	60.0
	Female	40	40.0	40.0	100.0
	Total	100	100.0	100.0	

Source: Primary Data

Fig.5.1: Percentage of Gender wise distribution



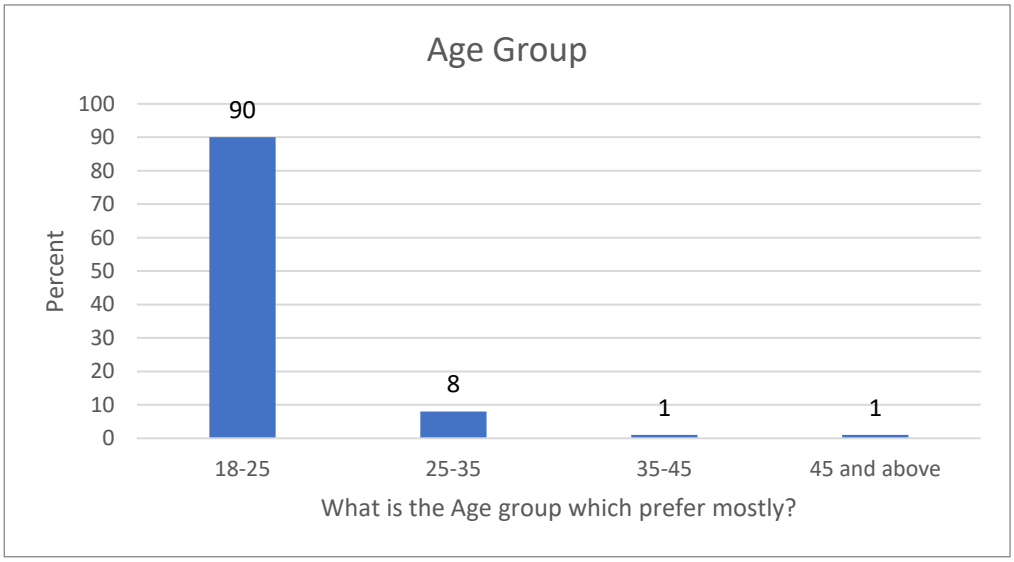
Source: Primary Data

Table 5.1 is clearly depicting that The sample has a **moderate gender imbalance**, with **more males (60%) than females (40%)**. While both genders are well represented, any analysis based on this data should take this proportion into account to avoid biased generalizations, especially if gender influences the outcome of the study.

ii.Age Distribution

Age group					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-25	90	90.0	90.0	90.0
	25-35	8	8.0	8.0	98.0
	35-45	1	1.0	1.0	99.0
	45 and above	1	1.0	1.0	100.0
	Total	100	100.0	100.0	

Source: Primary Data



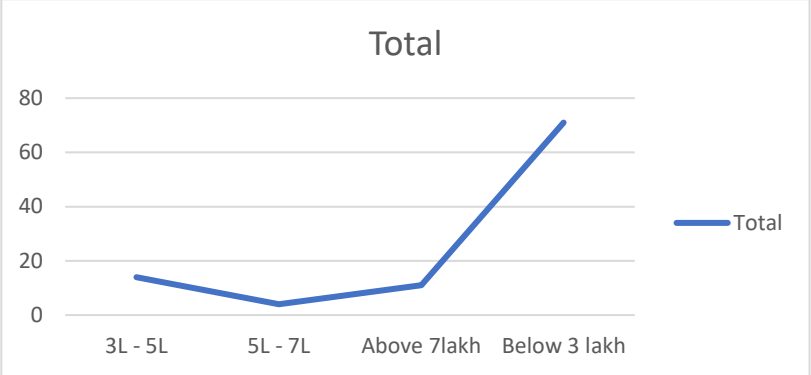
Source: Primary Data

The data shows a **youth-centric sample**, with 90% aged between 18 and 25. This is important for interpreting survey results or research findings — any conclusions drawn are likely most relevant to the **younger demographic** and may not reflect the views or behaviors of older age groups.

iii.Occupation:

Occupation	No of Respondents
Business	3
Govt Job	2
Private Job	4
Student	91
Grand Total	**100**

Source: Primary Data



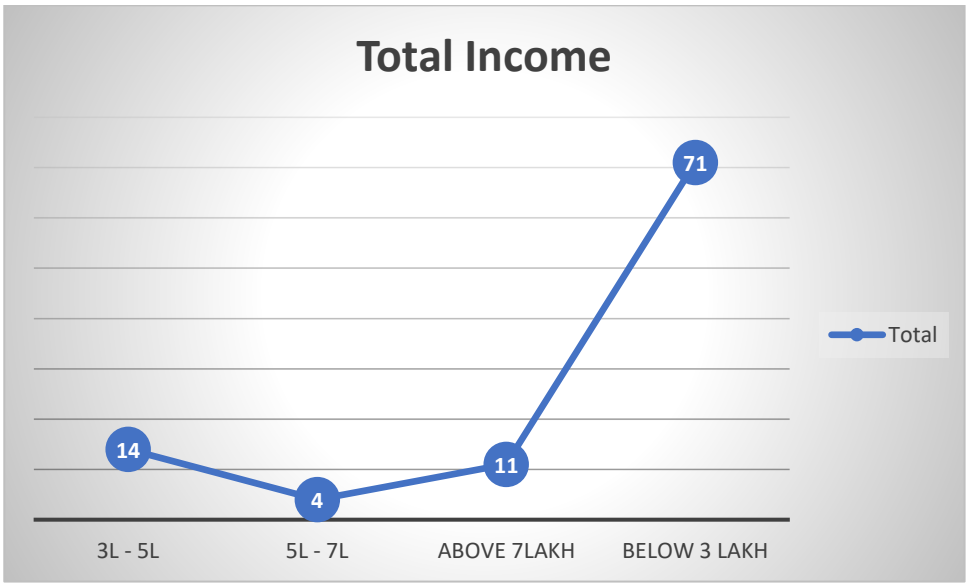
Source: Primary Data

The given data clearly shows that students make up the overwhelming majority of the respondents, accounting for 91% of the total. This indicates that the insights or perceptions gathered in the study are predominantly student-centric. Since the dataset is heavily skewed towards students, the findings and conclusions of the study may largely reflect **younger consumer behavior, awareness, and attitudes**—particularly regarding electric two-wheelers. Therefore, the results might not fully represent the perspectives of working professionals or experienced vehicle users.

iv.Annua Income

Income Level	No of Respondents
3L - 5L	14
5L - 7L	4
Above 7lakh	11
Below 3 lakh	71
Grand Total	**100**

Source: Primary Data



Source: Primary Data

The above graph shows the graphical presentation of the two wheeler users. Out of 107 respondents

54 of them are using petrol bike, it indicates that the petrol bike is most preferred two wheelers. 60 respondents are using petrol scooty. Then comes to the electric scooty which is used by only 7 respondents. Out of 107 Respondents, the study shows that only one person is using electric bike.

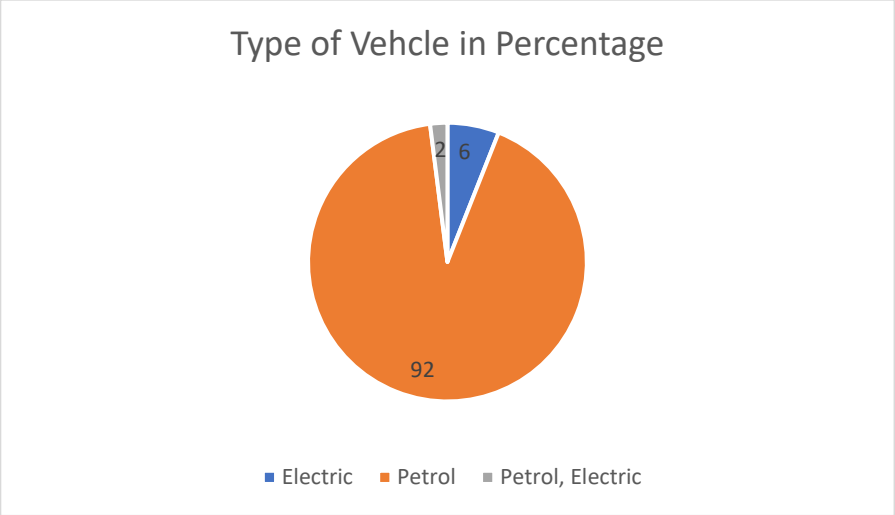
The above Graph Shows the graphical representation of the different factors, pricing got the highest rating as average this simply means that perception need to improve. Resale value also got the

B. Psychographic Analysis

1. Market Share of Petrol and Electric Vehicle

Type of Vehicle	Couse of Usage
Electric	6
Petrol	92
Petrol, Electric	2
Grand Total	**100**

Source: Primary Data



Source: Primary Data

a. Petrol Vehicles

Used exclusively by 92%

Additionally used **along with Electric** by **2%**

Total Petrol usage = 92 + 2 = 94%

b. Electric Vehicles

Used exclusively by 6%

Additionally used **along with Petrol** by **2%**

Total Electric usage = 6 + 2 = 8%

Market Share Interpretation:

Vehicle Type	Exclusive Usage	Combined Usage	Total Usage (Market Share)
Petrol	92%	2%	**94%**
Electric	6%	2%	**8%**

We can say that Petrol vehicles dominate the market with a 94% share, indicating a strong preference or dependency. Electric vehicles have a relatively small share (8%), suggesting they are still in the early adoption phase. A small segment (2%) of users are transitioning or using both vehicle types, showing potential growth in hybrid usage behaviour.

2. Perception towrds various factors towards two-wheeler purchasing:

Factor	Highly Important (Rating 5)	Moderately Important (Rating 3)	Least Important (Rating 1)	Observations
Price	31%	30%	10%	Price is a **key concern**, with 43% rating it highly.
Resale Value	12%	33%	11%	Resale value is mostly seen as **moderately important**.
Fuel Charge	23%	32%	12%	Fuel charge is **moderately to highly important**.
Weight of Vehicle	11%	40%	8%	Weight is **not a primary concern**, mainly rated as moderately important.
Vehicle Life	29%	25%	16%	Life is valued highly by many, but not universally.
Safety	**39%**	14%	12%	Safety is the **most important factor**, with the highest % at rating 5.

Source: Primary Data

Key Insights:

i. **Safety (39%)** and **Vehicle Life (29%)** are highly prioritized, showing that **durability and personal protection** are top concerns.

ii. **Price** and **Fuel Charges** follow, indicating that **economic considerations** also strongly influence buying decisions.

iii. **Resale Value** and **Weight of the Vehicle** receive mostly **neutral ratings**, suggesting they are not decisive for most buyers.

Summary:

- Buyers care most about **safety**, followed by **price** and **vehicle life**.

- **Practical cost factors** like **fuel charges** are significant but not dominant.
- **Resale value** and **vehicle weight** are generally less important.

3. Interpretation by Factor towards two-wheeler purchasing:

Factor	Highly Important (5+4)	Neutral (3)	Least Important (2+1)	Insights
E-vehicles are less harmful to environment	31% (21+10)	31%	38% (21+17)	Opinions are **evenly split**. Many see it as important, but a significant group does not rate environmental impact highly.
E-vehicles are not safe	46% (19+27)	30%	24% (13+11)	Safety concerns are **prominent**, with nearly half viewing it as a major issue.
High battery exchange cost	25% (11+14)	**43%**	32% (19+13)	Most respondents have a **neutral stance**, suggesting uncertainty or varied experiences.
Low resale value of E-vehicles	29% (15+14)	32%	39% (23+16)	A **larger portion views low resale value as less critical**, but concern exists among a smaller segment.

Source: Primary Data

Key Insights:

1. **Safety is a major concern** regarding E-vehicles, with the highest importance ratings (46%). This indicates a **trust gap in the safety** of electric two-wheelers.
2. **Environmental benefits**, while acknowledged by some (31%), are **not universally recognized** as important—suggesting that the eco-friendly advantage isn't a decisive factor for many.
3. **Battery exchange cost** and **resale value** are perceived **moderately to low in importance**, hinting at **ambivalence or unfamiliarity** with these aspects.
4. A large share of respondents show **neutral perception**, especially towards battery cost (43%), possibly reflecting a **need for more awareness or real-world experience**.

Conclusion:

The analysis of consumer perceptions regarding key vehicle selection factors reveals that safety, price, and vehicle life are the most influential elements in decision-making. Among these, safety stands out as the top priority, with the highest proportion (39%) of respondents rating it as extremely important. Price and fuel charge also hold significant weight, reflecting consumers' sensitivity to both initial cost and long-term operational expenses.

Moderate importance is attributed to resale value and weight of the vehicle, indicating that while these factors are considered, they do not play a primary role in shaping purchasing decisions. The data highlights a balanced mix of financial prudence and concern for durability and safety among consumers.

This insight can guide manufacturers and marketers to focus on enhancing safety features, competitive pricing, and fuel efficiency in order to better meet consumer expectations and preferences.

The perception data suggests that safety remains the dominant concern in the adoption of electric two-wheelers, overshadowing other factors like battery cost or environmental impact. While some value the ecological benefits of E-vehicles, a significant portion remains unconvinced. Overall, there is a clear need for increased consumer education and trust-building initiatives, particularly around safety, battery infrastructure, and long-term value retention.

Suggestions for E-Vehicle (Two-Wheeler) Companies Based on Consumer Perceptions:

1. **Enhance Safety Features:** Invest in advanced safety technologies like anti-lock braking systems (ABS), improved lighting, stability control, and durable frame design. Highlight safety certifications and crash test results in marketing materials to build trust.
2. **Ensure Competitive Pricing:** Offer varied models catering to different budget segments. Provide flexible financing, EMI options, and government subsidy integration to make vehicles more affordable.
3. **Improve Battery Infrastructure and Reduce Exchange Costs:** Develop partnerships for battery swapping stations and fast-charging networks. Offer battery leasing or warranty plans to reduce upfront costs and address concerns about high battery replacement expenses.
4. **Strengthen Vehicle Life and Durability:** Use high-quality materials and offer extended warranties to reinforce confidence in long-term performance. Promote real-world case studies or testimonials showcasing the longevity of existing E-vehicles.
5. **Communicate Environmental Benefits More Effectively:** Launch awareness campaigns to educate customers about the positive environmental impact of E-vehicles, including reduced emissions and energy efficiency. Collaborate with schools, colleges, and urban authorities for green mobility awareness.
6. **Address Resale Value Concerns:** Establish a certified pre-owned E-vehicle program to assure future resale support. Provide trade-in offers and buyback guarantees to enhance perceived value.
7. **Educate and Build Trust Among Consumers:** Conduct workshops, demo rides, and community engagement sessions to overcome skepticism. Use digital platforms, influencers, and existing satisfied customers to spread awareness about safety and performance.
8. **Differentiate with Fuel Efficiency and Maintenance Savings:** Clearly showcase cost savings over petrol/diesel two-wheelers in terms of fuel and maintenance. Provide cost calculators or comparison tools on the company website/app.

By focusing on these strategies, E-vehicle manufacturers can better align their products with consumer expectations, increase adoption, and strengthen their position in the growing electric mobility market.

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