

“Revving up the road: A review of India's electric vehicle market from a consumer perspective, policy landscape, marketing strategies and key issues”

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Abstract: Electric vehicles (EVs) have emerged as a promising solution for reducing carbon emissions and mitigating the negative impact of fossil fuels on the environment. In India, the government has taken significant steps to promote EV adoption and achieve its ambitious target of 30% EV penetration by 2030. However, the EV market in India still faces several challenges that need to be addressed for successful implementation. This review paper analyzes India's EV market from a consumer perspective, policy landscape, and key issues. It examines the current state of the EV market, including available vehicle types, pricing, and infrastructure. The study also analyzes government policies and initiatives to promote EV adoption and their impact on the market. Additionally, the paper explores key issues hindering the market's growth, such as charging infrastructure, consumer awareness, and affordability. The consumer perspective on EVs, including attitudes, perceptions, and preferences, is also investigated. By providing insights into the current state, challenges, and potential growth opportunities in the Indian EV market, this paper aims to assist policymakers, industry players, and stakeholders in making informed decisions and developing effective strategies for EV adoption.

Key Words: Electric vehicles, Market analysis, Consumer perspective, Policy landscape, Infrastructure, EV adoption, Charging infrastructure, Consumer awareness, Affordability, Government initiatives, Carbon emissions, Fossil fuels, Environmental impact, EV penetration, Attitudes, Perceptions, Preferences, Industry players, Stakeholders, Marketing strategies, Key players

INTRODUCTION

Current State of the EV Market in India

A. Types of EVs available in the market

The Indian EV market offers variety of electric vehicles, including there are four types of electric vehicles available:

- **Battery Electric Vehicle (BEV):** BEV's are fully powered by electricity. These are more efficient compared to hybrid and plug-in hybrids.
- **Hybrid Electric Vehicle:**
 - Hybrid Electric Vehicle (HEV): Here the vehicle uses both the internal combustion (usually petrol) engine and the battery-powered motor powertrain. The petrol engine does both the function: to drive and to charge when the battery is drained out. These vehicles are not as efficient as fully electric or plug-in hybrid vehicles.
 - Plug-in Hybrid Electric Vehicle (PHEV): It uses both, an internal combustion engine and a battery charged from an external socket (they have a plug). This allows for the vehicle's battery to be charged with electricity rather than the engine. PHEVs are more efficient than HEVs but less efficient than BEVs.

- **Fuel Cell Electric Vehicle (FCEV):** In these EV, electric energy is produced from chemical energy. For example, a hydrogen FCEV.

B. Pricing of EVs compared to conventional vehicles

As compared to the conventional vehicles, EV faces challenge pertaining to the cost in Indian market because of the cost of batteries, which constitute a significant portion of the vehicle's price leads to a significant increase in the price of EV as compared to conventional vehicles. Notwithstanding, the Indian government has acquainted a few drives with energizing the reception of EVs, including sponsorships and expense impetuses for EV producers and purchasers. The public authority likewise plans to get rid of the assembling and offer of gas-powered motor (ICE) vehicles by 2030, as would be considered normal to drive down the cost of EVs.

C. Infrastructure in place to support EVs

India is right now fostering its EV foundation to help the development of the EV market. The public authority has sent off the Distinction India plan to empower the foundation of charging stations for EVs. Starting around 2021, there are more than 1,000 charging stations in the nation, and the public authority intends to expand this number to 2,700 toward the finish of 2023. The confidential area is additionally putting resources into the EV framework, with organizations like Goodbye Power and Dependence Businesses setting up their own charging organizations. Nonetheless, the absence of a sufficient charging framework stays a huge test for the EV market in India, particularly in provincial regions.

POLICIES AND INITIATIVES TO PROMOTE EV ADOPTION IN INDIA

A. Government incentives for EV manufacturers and buyers

The Indian government has introduced several incentives to promote the adoption of EVs, including subsidies and tax benefits for EV manufacturers and buyers. The public authority offers a Quicker Reception and Assembling of Hybrid and Electric Vehicles (FAME) plan that gives monetary motivators to makers to create EVs and to purchasers to buy EVs. Under the plan, the public authority gives a sponsorship of up to 15% of the ex-industrial facility cost for EVs, dependent upon a limit of INR 1.5 lakh (roughly USD 2,000) for every electric vehicle.

B. FAME India scheme

The FAME India scheme was launched in 2015 to promote the manufacturing and adoption of EVs in India. The programme offers financial incentives to both producers and consumers to encourage the production and purchase of EVs. The programme was updated in 2019 to emphasise encouraging the use of EVs in shared mobility and public transportation. The programme provides incentives for EVs in a number of vehicle categories, including buses, two-wheelers, three-wheelers, and four-wheelers.

C. National Electric Mobility Mission Plan (NEMMP)

To encourage the use of EVs in India, the National Electric Mobility Mission Plan (NEMMP) was introduced in 2013. By promoting the creation and use of EVs, the initiative seeks to increase national fuel security and

lower carbon emissions. The plan provides a roadmap for the development of EV infrastructure and the promotion of EVs through various incentives.

D. Impact of policies on the EV market

The government's policies and incentives have had a positive impact on the EV market in India. The FAME India scheme has encouraged manufacturers to produce EVs, and the incentives provided to buyers have made EVs more affordable. Demand for EVs has also increased as a result of the government's aim to phase out the production and sale of ICE vehicles by 2030. The absence of suitable infrastructure, customer ignorance, and the scarcity of EV options on the market, however, continue to be major obstacles to the expansion of the EV market in India.

CURRENT PLAYERS OPERATING IN INDIAN MARKET

There are several players currently operating in the EV market in India, including:

1. *Tata Motors*: One of India's largest automotive manufacturers, Tata Motors produces a range of EVs, including the Nexon EV and Tigor EV.
2. *Mahindra & Mahindra*: Another major Indian automotive manufacturer, Mahindra & Mahindra produces the eKUV100 and eVerito EVs.
3. *MG Motors*: A subsidiary of the Chinese automaker SAIC, MG Motors produces the ZS EV and plans to launch additional EV models in India.
4. *Hyundai*: The Korean automaker Hyundai produces the Kona EV, which has gained popularity in the Indian market.
5. *Renault*: The French automaker Renault produces the Kwid EV and plans to launch additional EV models in India.
6. *Hero Electric*: An Indian electric two-wheeler manufacturer, Hero Electric produces a range of electric scooters and motorcycles.
7. *Ather Energy*: An Indian electric two-wheeler startup, Ather Energy produces the Ather 450X electric scooter.
8. *Ola Electric*: Ola Electric, a subsidiary of the ride-hailing company Ola, is set to launch its first EV, the Ola S1 electric scooter, in India in 2022.

These are some of the key participants in the Indian EV market, although there are also a number of smaller start-ups and foreign companies who are interested in breaking into the country.

MARKETING STRATEGIES

The marketing strategies used by current players in the EV market in India vary, but some common strategies include:

1. *Digital Marketing*: Most EV manufacturers in India use digital marketing to target potential customers through social media platforms, search engines, and email campaigns. For example, Tata Motors used social media to promote the launch of its Nexon EV and Mahindra & Mahindra used a mix of digital channels to promote the eKUV100.
2. *Brand Partnerships*: Some EV manufacturers have partnered with other brands to increase their visibility and promote their products. For example, Tata Motors partnered with Ola to promote its Nexon EV and Mahindra & Mahindra partnered with Amazon India to offer test drives of the eVerito.
3. *Events and Experiences*: EV manufacturers often organize events and experiences to showcase their products and educate consumers about the benefits of EVs. For example, MG Motors organized a series of roadshows to promote its ZS EV and Hyundai organized test drive events across major cities in India to promote the Kona EV.
4. *Financing Options*: Many manufacturers provide financing solutions, like as low-interest loans and flexible payment plans, to make EVs more accessible and cheap for consumers. For instance, Ather Energy offers finance through its own internal financing programme, and Hero Electric offers financing alternatives through a number of institutions.
5. *Environmental Messaging*: Many EV manufacturers in India use environmental messaging in their marketing campaigns to highlight the eco-friendliness of their products. For example, Renault's Kwid EV campaign featured the tagline "Charged for tomorrow" and emphasized the vehicle's zero-emissions technology.

MARKET SHARE OF CURRENT PLAYERS

Depending on the individual market category, different current players have different market shares in India's EV industry. The following are the market shares of some of the top EV companies in India for the years 2020–21, as reported by the Society of Indian Automobile Manufacturers (SIAM):

1. *Hero Electric*: 36% market share in the electric two-wheeler segment.
2. *Tata Motors*: It has a 63% market share in the market for electric passenger cars, partly as a result of the Nexon EV's popularity.
3. *Mahindra & Mahindra*: 23% market share in the EV passenger vehicle segment, with the eKUV100 and eVerito.
4. *Ather Energy*: 23% market share in the premium electric scooter segment, with the Ather 450X.
5. *Bajaj Auto*: 78% market share in the electric three-wheeler segment, with the Qute RE Electric.

It's important to keep in mind that India's EV market is still quite modest when compared to the country's entire automotive sector, leaving plenty of space for expansion and competition. Additionally, according to variables like new product introductions and shifting consumer tastes, market share estimates might change from year to year.

KEY ISSUES HINDERING THE GROWTH OF THE EV MARKET IN INDIA

A. Lack of charging infrastructure

The absence of a sufficient charging infrastructure is one of the biggest issues the Indian EV sector is now facing. Even while the Indian government has started programmes to build EV infrastructure, such as the FAME India programme, there are still not many charging stations, particularly in rural regions. It is difficult for EV owners to go across long distances and recharge their vehicles due to the absence of infrastructure.

B. Consumer awareness and education

The lack of customer awareness and education regarding EVs is a big obstacle the Indian EV sector must overcome. Many Indian consumers are unaware about the technology underlying EVs, the advantages of utilising EVs, and how to use them. Consumers are reluctant to move from ICE to EVs as a result of the lack of demand for EVs.

C. Affordability of EVs

Another difficulty facing the Indian EV market is the high cost of EVs in comparison to conventional automobiles. Although the government offers tax breaks and subsidies to EV makers and buyers, the price of batteries means that EVs are still expensive. Due to this, many Indian consumers find it difficult to acquire EVs, especially in rural areas where salaries are lower.

D. Limited options for EVs in the market

Another problem the Indian EV business must handle is the small number of EVs that are offered on the market. There are just a few different models and brands of EVs, despite the fact that there are numerous EV kinds available, including BEVs, PHEVs, and HEVs. This limits the range of EVs that consumers can purchase and delays the growth of the EV market.

CONSUMER PERSPECTIVE ON EVS

A. Attitudes towards EVs

India's consumers have a variety of opinions about EVs. Others have doubts about the technology's dependability, safety, and price, despite the fact that some consumers are excited about the technology's promise to lower carbon emissions and encourage sustainable mobility. Additionally, some consumers are uninterested in EVs because they are unfamiliar with them.

B. Perceptions of EVs compared to conventional vehicles

Consumers in India frequently see electric vehicles (EVs) more as a novelty than as a useful substitute for conventional automobiles. Many consumers remain cautious about the dependability, safety, and price of EVs despite the fact that some consumers believe they are cleaner and more ecologically friendly than conventional automobiles. Additionally, some customers believe that EVs have a short range and are difficult to recharge.

C. Preferences for EVs based on features and benefits

In India, consumer preferences for EVs are mostly influenced by the perks and features the cars provide. Customers are very interested in electric vehicles (EVs) with long driving ranges, quick charging, and reasonable prices. Customers are also drawn to EVs with contemporary amenities like cutting-edge safety features, connectivity possibilities, and entertainment systems. Additionally, consumers are drawn to EVs that support sustainable transportation and have little negative effects on the environment.

In conclusion, there are many different consumer perspectives on EVs in India, ranging from enthusiastic support to scepticism. But the features and advantages that EVs have to provide are what really influence consumer preferences. For India to adopt EVs and meet its targets for lowering carbon emissions and boosting sustainable transportation, it will be essential to address customer concerns about dependability, safety, affordability, and convenience.

OPPORTUNITIES FOR GROWTH IN THE EV MARKET IN INDIA

A. Potential for EVs in the public transportation sector

The potential for EVs in the public transport industry is one important area for growth in the Indian EV market. By electrifying all public transport vehicles by 2030, the government hopes to significantly expand the market for electric automobiles. Carbon emissions might be significantly reduced and sustainable transportation could be promoted if EVs are used in public transportation. In addition, the usage of EVs in the public transport industry may help to clean up the air and lessen noise pollution in cities.

B. Expansion of charging infrastructure

The development of the infrastructure for charging EVs is another possibility for market expansion in India. The FAME India programme is one of the measures the government has started to create EV infrastructure. However, there are still not enough of them, particularly in rural areas. Increasing the availability of charging stations will be essential for encouraging the use of EVs and resolving consumer concerns about convenience and dependability.

C. Collaborations between government, industry players, and stakeholders

Another chance for the Indian EV market to expand is through partnerships between the government, key firms in the sector, and other stakeholders. In order to encourage the use of EVs, the government has started a number of measures, such as the National Electric Mobility Mission Plan. To achieve the nation's objectives for cutting carbon emissions and boosting sustainable mobility, cooperation between the government, industry actors, and stakeholders will be essential. Collaborations can encourage innovation, open up new business prospects, and make it easier to share information and resources.

The expansion of the charging infrastructure, the potential use of EVs in the public transportation sector, and partnerships between the government, business actors, and stakeholders all present substantial growth opportunities for the Indian EV market. For India to adopt EVs and reach its targets for lowering carbon emissions and boosting sustainable transportation, it will be essential to take advantage of these opportunities.

CONCLUSION

The EV market in India has been thoroughly examined in this article from the standpoint of consumers, the regulatory environment, and the major problems impeding expansion. The study found that even while the EV industry in India is expanding, there are still major issues that must be resolved in order to encourage the adoption of EVs and meet the nation's objectives for lowering carbon emissions and boosting sustainable mobility.

According to the study, customers in India have a range of opinions about EVs, with some being enthusiastic and others being dubious. Customers also view EVs as a novelty rather than a viable substitute for conventional automobiles. Policymakers, industry participants, and stakeholders must concentrate on raising public awareness and education about EVs, making EVs more affordable, enhancing the charging infrastructure, and encouraging cooperation between the government, industry participants, and stakeholders.

Also, the government has started a number of programmes to encourage the use of EVs, including the FAME India programme and the National Electric Mobility Mission Plan.

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