

# FUTURE OF ELECTRIC VEHICLES (EVs) IN INDIA

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## Abstract:

The automobile industry is growing so well as the growing importance is being felt for low carbon emissions, to combat air pollution and to improve the energy efficiency. This is not the case only in India but is prevalent all over the globe. Governments are also playing their role so well by making supportive policies and by providing incentives to the undertakings involved in automotive industry. Big corporate houses are also contributing their bit by making use of these green vehicles. This research paper attempts to study the trends, technological developments, challenges and the functions of governmental regulations related to electric vehicle industry in India. It also throws light on the impact of EV adoption on the environment, society and economy. Both primary and secondary data have been used for in-depth analysis. It has been concluded that with sincere efforts on the part of all stakeholders, EV industry will become a major driver of Indian economy by the year 2030.

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## Introduction:

The Indian automobile industry is major contributor to the economy of the nation. But, due to increased environmental awareness, concerns have been raised regarding impact of running internal combustion engine (ICE) vehicles. The pollution levels are rising on an alarming rate due to burning of fossil fuels and its immediate effect on air quality. So, it is required to take some corrective steps. Electric vehicles appear as a boon in this regard. But, this boon comes with a whole lot of challenges namely low consumer awareness, high cost of electric vehicles and poor infrastructure like less charging stations. To solve these problems and to promote the production and usage of electric vehicles, the government has launched many plans and policies and assesses potential future developments and trends.

The initiatives like the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme have significantly contributed towards the adoption of EV industry in India. As per the reports of the International Energy Agency (IEA), the EV industry of India can grow significantly if focus is kept on introducing more policies, improving battery technology and enhancing the infrastructure.

As per the report of Bloomberg New Energy Finance, more public private partnerships could result in making the electric car fleet equal to thirty percent of total car fleet running in India by the year 2030,

But to achieve this target, necessary action should be taken to remove the barriers like high cost of electric vehicles, lack of charging infrastructure and anxiety about range among the customers.

## RESEARCH OBJECTIVES:

This research study tries to cover the following objectives:

1. To assess the current situation of Indian electric vehicle market.
2. To evaluate how government programs and policies affect the adoption of EVs.
3. To assess the consumer perception related to EV industry.
4. To look into the obstacles preventing the nation from adopting electric vehicles on a large scale.

## RESEARCH METHODOLOGY

Mixed method approach has been used in this study. Both secondary and primary data have been used here. Primary Data has been collected with the help of Questionnaires to assess the attitude of Indian consumers of EV and their awareness. Likewise, secondary data has been taken from various journals, research papers, reports published by government and industry groups, reports of NITI Aayog, the Ministry of Heavy Industries and the Indian Automotive Industry Association (SIAM) have also been accessed.

### **Sampling Techniques**

Stratified random sampling method has been used to ensure equal representation of data from all the segments. Data has been collected from 100 consumers who own an automobile or are willing to buy one in coming one year.

### **Data Analysis Techniques**

Descriptive Statistics have been employed to assess trends in consumer preferences related to EV adoption. Thematic Analysis and SWOT analysis have been done for the challenges and opportunities for EV growth in India and to assess the strengths, weaknesses, opportunities and threats of EV industry in India.

### **Analysis and Findings of Data**

#### **Current State of the EV Market in India**

The EV market in India is still budding. Contrary to this, EV market in developed nations has developed fully. But, it has observed that the sales of electric vehicles is increasing rapidly due to the increasing level of awareness among common people and due to increased efforts on the part of government. The government of India launched FAME II initiative in the year 2019 to distribute financial subsidies to EV manufacturers and consumers. If we look at the sales figures of the year 2023, electric vehicles contribute towards 1.5% of the total automobile sales in India. This is very tiny, but it is expected that this contribution can rise upto 30% by the year 2030.

#### **Technological Advancements in India:**

Battery manufacturing has been promoted in India in the last few years by means of National Mission on Transformative Mobility and Battery Storage. This has reduced the total costs of production and has improved the energy density. Further, It has been seen that the cost of lithium-ion batteries has reduced which is mostly used in electric vehicles. The current EV market in India can be described with the help of following points:

- 1) The share of EV market in India is 1.5% which is expected to reach 30% in the year 2030.
- 2) Significant decrease in battery costs is expected which will further reduce the cost of EVs. In the last decade, the battery costs have reduced by almost 87%.
- 3) FAME II and NEMMP act as key boosters in adoption of EVs. 5,00,000 electric vehicles and 1,000 charging stations have been provided subsidy under FAME II.
- 4) As per the reports of IEA and NITI Aayog, 2-3 million charging points are required to be set up to meet the ever increasing demand.
- 5) High costs of EVs act as a significant barrier in their widespread adoption. As per the reports of SIAM, Companies like Tata Motors and Mahindra Electric will soon introduce affordable models of EVs.
- 6) As per the study by IEA, carbon emissions will reduce by 30% by the year 2030 which will contribute to less air pollution and cleaner air.
- 7) Both government and industry are organizing special campaigns to create awareness pertaining to electric vehicles among the rural population as it has been seen that urban areas are ahead in adoption of EVs.

#### **Role of Government Policies**

The main initiatives of the government of India to promote the production and usage of electric vehicles include the following:

1. The FAME scheme was launched to provide subsidies on the purchase of electric vehicle and on establishing charging infrastructure.

2. The National Electric Mobility Mission Plan (NEMMP) was launched in the year 2020 to ensure increased EV usage by the year 2030.

3. Various policy initiatives have been launched by the government to promote establishment of charging infrastructure, that include public-private partnerships to start charging stations all over the nation.

### **Consumer perception related to EV industry**

The analysis of primary data concludes that following points:

1. Almost 55% of respondents were conscious about the high cost of EVs.
2. 80% of respondents under study were highly satisfied with the government support in EV adoption.
3. 60% of respondents were hesitant to adopt EVs mainly because of the lack of charging stations.
4. Almost 70% of respondents were reluctant to buy EVs mainly because of their high prices.
5. 45% of respondents were impressed by the eco-friendly nature of EVs but were doubtful about the range and available infrastructure.
6. 60% of consumers cited the less availability of charging stations as a major challenge and 50% of consumers cited less variety of EV models as a challenge.
7. 25% of respondents under study are planning to buy an EV within the next 5 years.
8. 55% of the total respondents belonging to urban areas were ready to buy an EV. Contribute to it, only 35% of the total respondents belonging to rural areas were ready to buy an EV.
9. 80% of the respondents were satisfied with the environmental benefits of EVs as they help in reducing pollution and carbon emissions.
10. 55% of the respondents are not well-informed about the operational benefits, rebates, and overall functioning of EVs.
11. 65% of respondents belonging to metro cities are more likely to purchase EVs due to availability of better infrastructure.

### **Challenges Hindering EV Adoption**

The major challenges that come under the way of growth of EV industry in India are:

1. The cost of purchasing an electric vehicle is much higher than the cost of buying an ICE vehicle. So, the Indian consumers are reluctant to buy an electric vehicle.
2. There is less availability of charging stations all across the nation. So, buyers are hesitant to buy an EV as they may find difficulty in charging their vehicle on the go.
3. Other issues related to battery life, the charging speed of the battery and the range of the vehicle are some other challenges.

### **Future Prospects of Electric Vehicles in India**

Experts are hopeful that EV industry of India will grow in the near future due to the following factors:

1. Government is launching many initiatives and policy frameworks that aim at promoting EV adoption in India and the special focus is on rural areas.
2. Technological advancements in lithium-ion battery technology and increased production of batteries in India has reduced the prices of batteries significantly that has ultimately reduced the overall cost of production of EVs.
3. The overall infrastructure related to Electric Vehicles is expanding and hence the range anxiety of the consumers of EV will also reduce.

### **Conclusion:**

The electric vehicles industry will definitely bloom in India as it is backed by favorable government policies, innovative technological advancements and increasing environmental awareness among the common people of the nation. But there are a lot of hurdles in this journey. Some of them being high costs of production and inadequate

infrastructure. However, more investment in this industry will pave way for growth of Indian automotive market in the coming years.

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