



An Analysis Of The Adoption Of Electric Vehicle In India

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ABSTRACT

The market for electric vehicles (EVs) in India is rapidly growing due to government incentives, increased awareness of environmental issues, and advancements in technology. Through initiatives such as the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme, India aims to significantly enhance the adoption of EVs, steering its transportation system towards sustainability and innovation. To investigate the rise in electric vehicle sales in India and to evaluate the uptake of electric vehicles by examining sales figures in India. This analysis utilizes secondary data obtained from diverse reports. This leads us to the following facts: the number of anticipated vehicles on the road is expected to double in the near future, making the demand for this alternate energy source clear and promising. The government's and other business entities' objectives and investments make it abundantly evident that the EV industry in India will have to contend with rising EV consumption

INTRODUCTION

The electric vehicle (EV) market in India is expanding quickly thanks to government subsidies, growing environmental awareness, and technology breakthroughs. India hopes to dramatically boost EV adoption through programs like the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme, transforming its transportation system in the direction of sustainability and innovation.

By 2030, India wants to increase the percentage of sales of electric vehicles (EVs) to 30% for private automobiles, 70% for commercial vehicles, 40% for buses, and 80% for two- and three-wheelers. By 2030, there will be 80 million EVs on Indian roadways, which is an ambitious goal. Additionally, India's 'Make in India' campaign aims to produce all EVs domestically.

NEED OF THE ANALYSIS

- To study the adoption of Electric Vehicle in India.
- To study the increase in sales of EVs in India .
- To analyse the adoption of EVs through the sales of EVs in India.

SCOPE OF THE ANALYSIS

- This analysis will help in understanding the increase in the adoption of EVs in India.
- It helps in gaining knowledge about various categories of EVs in India and its sales.

OBJECTIVES OF THE ANALYSIS

- To understand the process of adoption of EVs in India.
- To determine the evolution of EVs in India.

METHODOLOGY OF THE ANALYSIS

- This study is based on secondary data collected from the various reports of the VAAHAN Portal, Society of Manufacturers of Electric Vehicles, Indian Brand Equity Foundation.
- The period of study is covered from the year 2016 - 17 to 2023 - 24

REVIEW OF LITERATURE

CONSUMER PREFERENCES FOR ELECTRIC VEHICLES: Fanchao Liao, Eric Molin, Bert van Wee (2017). Widespread adoption of electric vehicles (EVs) may contribute to the alleviation of problems such as environmental pollution, global warming and oil dependency. However, the current market penetration of EV is relatively low in spite of many governments implementing strong promotion policies. This paper presents a comprehensive review of studies on consumer preferences for EV, aiming to better inform policy-makers and give direction to further research. First, we compare the economic and psychological approach towards this topic, followed by a conceptual framework of EV preferences which is then implemented to organize our review. Finally, we discuss a research agenda to improve EV consumer preference studies and give recommendations for further research.

PROSPECTS OF ELECTRIC VEHICLES IN THE DEVELOPING COUNTRIES: Sarmad Zaman Rapier, Johan Albrecht (2020). Electric mobility offers a low cost of travel along with energy and harmful emissions savings. Nevertheless, a comprehensive literature review is missing for the prospects of electric vehicles in developing countries. Such an overview would be instrumental for policymakers to understand the barriers and opportunities related to different types of electric vehicles (EVs). Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines, a systematic review was performed of the electronic databases Google Scholar and Web of Science for the years 2010– 2020. electric four-wheelers, hybrid electric vehicles and electric two-wheeler constituted the electric vehicles

searched in the databases. Results reveal that electric four-wheelers are not a feasible option in developing countries due to their high purchase price. On the contrary, electric two wheelers may be beneficial as they come with a lower purchase price.

INDIAN ELECTRIC VEHICLE MARKET

The global market for electric vehicles was estimated to be worth US\$255.54 billion in 2023. It is expected to develop at a noteworthy compound annual growth rate (CAGR) of 23.42% from 2024 to 2033, reaching over US\$ 2,108.80 billion.

Sales of electric vehicles in India increased by 20.88% to 1.39 million units in May 2024.

The number of electric vehicles sold in India increased by 49.25% to 1.52 million units in 2023. Even though the industry is still in its infancy, it is growing steadily. The Indian EV market is expected to grow at a 66.52% compound annual growth rate (CAGR) from US\$ 3.21 billion in 2022 to US\$ 113.99 billion by 2029, according to Fortune Business Insights.

Globally, the trend toward electric vehicles will open up new markets for auto suppliers. By 2028, it is anticipated that the Indian EV battery market will have grown from US\$ 16.77 billion in 2023 to an astounding US\$ 27.70 billion.

As of February 2024, there were 12,146 public EV charging stations in service across the country. Maharashtra has the most EV charging stations, followed by Delhi and other states. According to a recent Confederation of Indian Industry (CII) assessment, in order to support the rapid expansion of electric vehicles, India must have at least 1.32 million charging stations by 2030, which calls for more than 4,000 installations every year.

Hyundai Motor India is expanding its ultra-fast EV charging network with 11 new stations strategically placed in cities like Mumbai, Pune, Ahmedabad, Hyderabad, Gurugram, and Bangalore, as well as along major highways. This is part of an effort by major industry players to improve the infrastructure for charging electric vehicles.

By December 2025, Maharashtra wants 10% of all new car registrations to be EVs. By December 2030, Karnataka wants all three-wheeled and four-wheeled transport vehicles to be electrified.

MARKET SIZE

Indian consumers are very interested in New Energy Vehicles (NEVs), according to a recent study, with 83% of participants saying they are prepared to only buy NEVs in the future by the end of this decade.

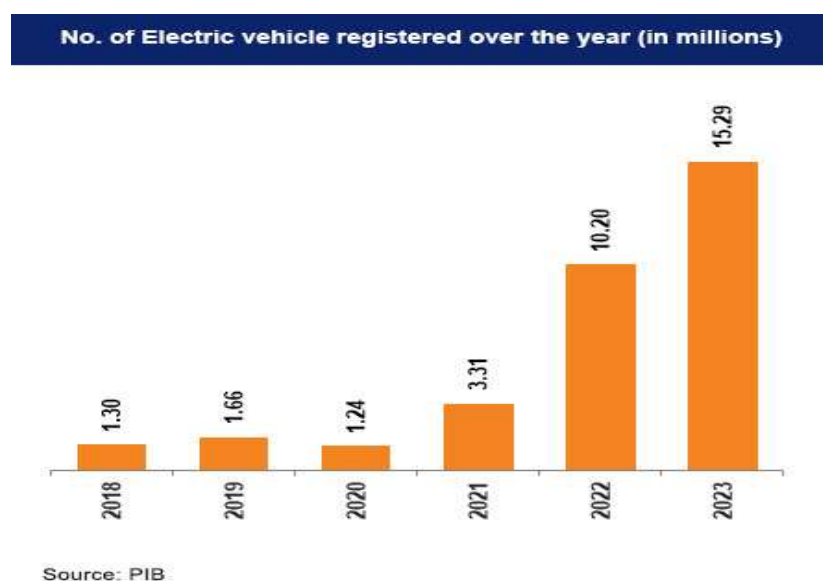
With 14.20% of all new cars sold this year being electric, Goa tops the nation in EV adoption on a state-by-state basis. Tripura and Chandigarh are next in line. With a penetration rate of 10.72%, Delhi stands out as well, demonstrating the capital's commitment to sustainable urban mobility.

It is projected that the electric vehicle market in India would grow at a compound annual growth rate (CAGR) of 28.52%, reaching US\$ 18.319 billion by 2029 from US\$ 5.22 billion in 2024.

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The Rocky Mountain Institute (RMI) and NITI Aayog predict that by 2030, the EV finance sector in India will have grown to a value of Rs. 3.7 lakh crore (US\$50 billion).



INVESTMENT

- Notable EV investment promises in 2024 include VinFast up to Rs. 16,500 crore (US\$ 2 billion), Royal Enfield Rs. 3,000 crore (US\$ 358.1 million), Stellantis Rs. 2,000 crore (US\$ 238.7 million), and Tata Motors-JLR Rs. 9,000 crore (US\$ 1.07 billion).
- Tata Motors intends to invest about Rs. 18,000 crore (US\$ 2.16 billion) to build an ecosystem for its electric vehicle industry, with the goal of having 30–40% of its sales come from EVs by FY30. The business plans to introduce new models throughout the course of the following two years.
- Ather Energy's valuation has increased to US\$ 1.3 billion after obtaining Rs. 600 crore (US\$ 71 million) from the National Investment and Infrastructure Fund. With this investment, Ather is positioned to become the fourth unicorn in India in 2023.

- In February 2024, YULU successfully raised US\$ 19.25 million (Rs. 160 crore) for its activities. Additional shares were issued to Magna and Bajaj Auto Ltd., Yulu's current strategic supporters, in order to secure the capital.
- An deal was struck in June 2024 between MUON India Private Limited, a Macquarie Group entity, and BM Electric Vehicles Private Limited, a subsidiary of JBM Auto Limited. In India, Macquarie Group has introduced 'Vertelo,' an EV finance platform that would offer fleet management, financing, and charging infrastructure services.
- On Wednesday, Uno Minda, a manufacturer of car parts, revealed that it has teamed up with Suzhou Inovance Automotive Co. of China to manufacture parts for electric vehicles in April 2024.
- Okaya EV, a well-known manufacturer of electric two-wheelers, introduced "Ferrato," their premium brand of electric vehicles, in March 2024. As part of their plan to expand countrywide, they will give priority to high-end models.
- With 205 patents in electric vehicles and related technologies, Ola Electric, which is preparing for an initial public offering (IPO), surpassed competitors to become India's leading patent publisher for 2022–2023.
- Ola Electric has announced plans to launch the Raahi, a consumer-focused electric autorickshaw, in March 2024.
- The world's top manufacturer of New Energy Vehicles (NEVs), BYD India, announced in March 2024 that it will be entering the premium electric sedan market with the BYD SEAL. The BYD ATTO 3 and the All-New e6 are the two items that BYD India now offers, and both have been highly praised by Indian customers.
- The Indian Oil Corporation (IOC) opened its first battery-swapping station for electric vehicles (EVs) in Kolkata in December 2023. By working with Sun Mobility, the oil marketing PSU demonstrated its dedication to developing environmentally friendly electric vehicle solutions.
- SAIC Motor and JSW Group launched a strategic joint venture in November 2023 with an emphasis on green mobility to drive growth.
- Adani TotalEnergies E-Mobility Limited (ATEL) announced in August 2023 that it will be partnering with Prakriti E-Mobility (Evera), an all-electric taxi aggregator, to install EV charging infrastructure, beginning with a 200-point super hub in Delhi.
- Gujarat's electric vehicle (EV) market is growing quickly because to strong demand and government support. Compared to 2021, when EV sales were 10,885 units, EV sales in 2023 increased by 28% to 88,619 vehicles, a phenomenal 714% gain over three years.

- Mahindra & Mahindra expects its new facility in Chakan, Maharashtra, to reach a peak production capacity of 200,000 electrified vehicles per year between 2027 and 2029 in August 2023. By 2030, they predict that EVs will account for 30% of all volumes.
- The Indian Army suggested in February 2024 to gradually introduce a limited number of electric vehicles (EVs) at "Peace Stations" across the country. This program seeks to reduce dependency on fossil fuels, embrace technology innovations, and boost green energy.
- Access to relevant information was made easier with the launch of the new EV-Ready India Dashboard (evreadyindia.org) in New Delhi in October 2023 by Mr. R. K. Singh, Union Minister for Power and New & Renewable Energy.
- In October 2023, Mr. S Krishnan, Minister of Electronics & Information Technology (MeitY), was present at the IIT Madras Research Park to witness the launch of a domestically made 2KW DC portable charger. The goal of this program is to hasten the adoption of electric vehicles.
- VinFast and the Tamil Nadu government signed a memorandum of understanding (MoU) in January 2024 to invest US\$ 2 billion in an EV plant in Thoothukudi. The first phase of the project is expected to produce 150,000 units yearly, with US\$ 500 million invested.

GOVERNMENT INITIATIVES

The government's goal of 30% electric mobility by 2030 and its dedication to EVs have been reaffirmed. The budget declared that capital goods and equipment needed to produce the lithium-ion batteries that power EVs would not be subject to customs duties.

With a total budgetary support of US\$ 1.43 billion (Rs. 10,000 crore), the FAME II for EV Scheme got underway on April 1st, 2019. SMEs must account for 30% of the acquisition of manufactured or processed goods. The electrification of shared and public transportation is the main goal of this phase.

Under phase II of the FAME India Scheme, electric vehicle makers have been given a subsidy of Rs. 5,790 crore (US\$ 693 million) for the sale of 1,341,459 electric vehicles. Demand incentives are intended for 10,090 e-2-wheelers, 5 lakh e-3-wheelers, 55,000 e-4-wheeler passenger cars, and 7,090 e-buses. The plan also encourages the construction of infrastructure for charging. As of December 2023, Phase-II of the FAME India Scheme provided electric vehicle makers with a subsidy of US\$ 637 million (Rs. 5294.00 crore) for the sale of 11,79,669 electric vehicles.

The government has proposed a plan to replace 800,000 diesel buses with more ecologically friendly models, potentially replacing FAME III.

Within seven years, the plan calls for replacing 800,000 diesel buses—which make up more than one-third of all vehicles on the road—with electric ones. This initiative aims to reduce vehicle emissions and encourage investments in the country's infrastructure for electric vehicles (EVs).

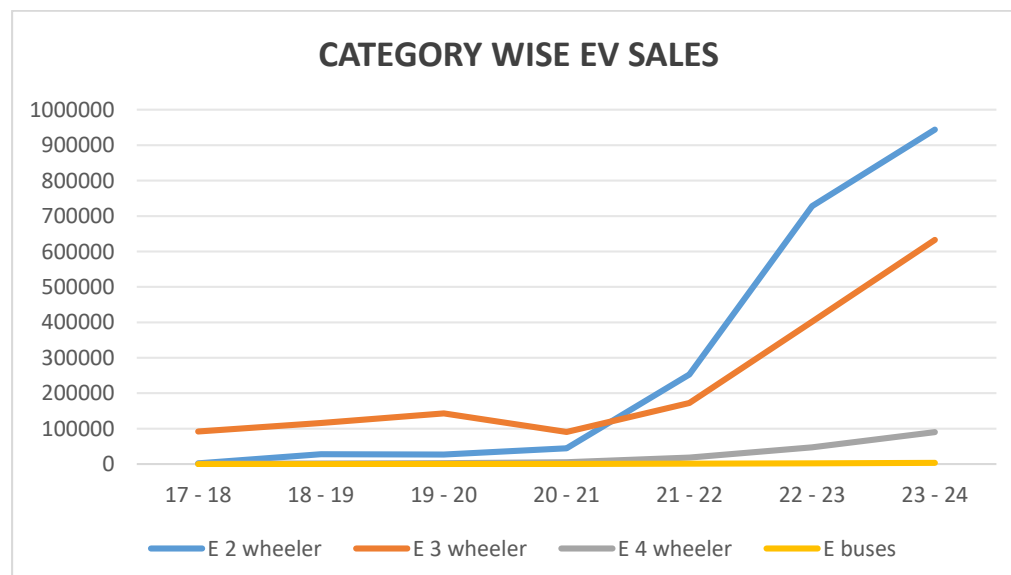
With a budget of US\$ 60.18 million (Rs. 500 crore), the Electric Mobility Promotion scheme will run from April 1 to July 31, 2024, with the goal of being implemented effectively during that time.

Additional steps will be taken to support this industry in order to improve green mobility and encourage the production of electric vehicles in the nation. Electric two-wheelers (e-2W) and three-wheelers (e-3W) will be able to use it. The scheme offers incentives only for advanced battery-equipped vehicles and supports 3,72,215 EVs, including 3,33,387 e-2Ws and 38,828 e-3Ws (including 13,590 rickshaws & e-carts and 25,238 e-3Ws in L5 category).

SALES DATA AND ANALYSIS

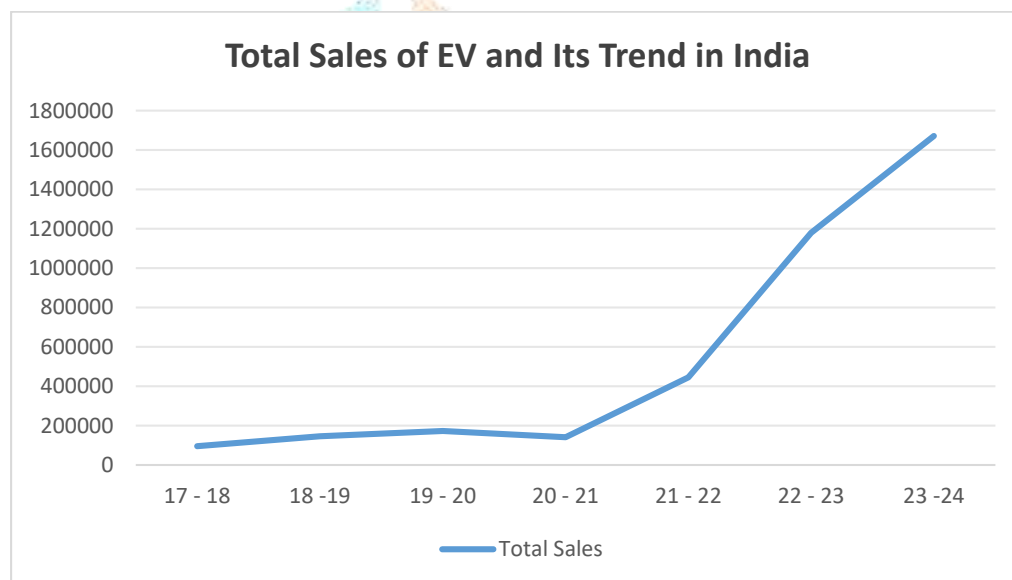
Electric Vehicle Sales - Dashboard								
Category	17-18	18-19	19-20	20-21	21-22	22-23	23-24	Grand Total
E-2 Wheelers	2005	28007	26834	44803	252642	728054	944126	2026471
E-3 Wheelers	91970	116031	143051	90898	172543	401882	632485	1648860
E-4 Wheelers	1204	1885	2377	5154	18622	47499	90432	167173
E-Buses	19	66	434	373	1194	1984	3693	7763
Grand Total	95198	145989	172696	141228	445001	1179419	1670736	3850267

*Figures in Nos. *This data as on 22nd October, 2024.



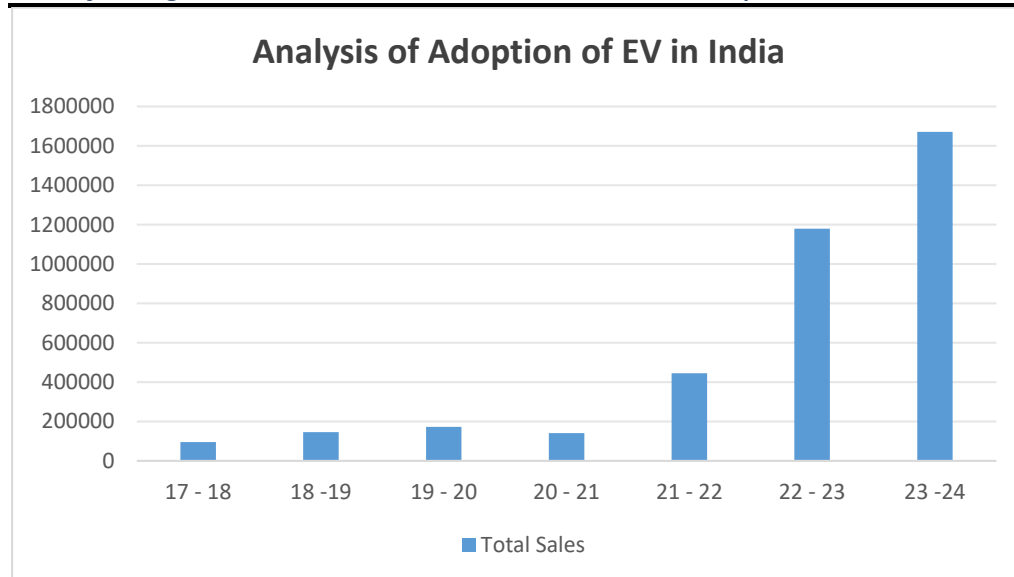
INTREPRETATION

- ◆ The Electric Vehicle Sales Dashboard shows the category wise sales of each year from 2017 - 18 to 2023 - 24.
- ◆ The Electric Vehicle Sales Dashboard clearly represents the increase in sales numbers which directly reflects on the increase in adoption of EVs in India every year.
- ◆ There is an enormous increase in the sales of E 2 wheelers from the year 2020-21 to 2023-24
- ◆ Likewise E 4 wheelers also meets an increase in sales from the year 2021-22.
- ◆ What is to be noted is that the increase in sales of E 3 wheelers indicates the use of EVs in the commercial sector of the Road Transportation.



INTREPRETATION

The above mentioned Trend Chart of EV in india clearly indicates the rising trend of EVs in India. We can clearly notice the rising trend which reflects an enormous increase in the sales of EV from the year 2021-22 to 2023-24.



INTREPRETATION

This Analysis Chart proves that the Electric Vehicle Industry in India has been in the rising trend from the Year 2021-22 to till date.

FINDINGS OF THE ANALYSIS

- In this analysis we have found that the usage of electric vehicles in India has been in the rising trend.
- We have found out the category wise analysis of sales of EVs in India
- We found the increase in sales of E 2 wheelers in India which reflects the use of EVs as an Commercial Vehicle.
- We found out the increase in sales of E 3 wheelers in India
- We have studied the year wise sales of EVs in India to analyse its rising trend and its rate of increase in sales.

CONCLUSION

- With this, we come to following facts that number of expecting vehicle doubling on the roads in the near future the need for this alternating energy is very evident and has promising returns.
- From the above seen charts we can see the interest of people in adopting to EV.
- The goals and investments made by the government and other corporate companies clearly states that the EV industry in India will face an increase in the sales which will result in continuing its rising trend in the upcoming years too.

REFERENCE

- ◆ International Organization of Motor Vehicle Manufacturers
- ◆ Department for Promotion of Industry, and Internal Trade (DPIIT)
- ◆ Automotive Component Manufacturers Association of India (ACMA)
- ◆ Society of Indian Automobile Manufacturers (SIAM)
- ◆ Union Budget 2023-24
- ◆ EY Parthenon Electrifying Indian Mobility.
- ◆ Confederation of Indian Industry (CII)
- ◆ Society of Manufacturers of Electric Vehicles (SMEV)
- ◆ Indian Brand Equity Foundation (IBEF)
- ◆ VAAHAN Portal
- ◆ NITI Aayog
- ◆ Fortune Business Insight

