



A Study on the Current State of EV Scenario at Global Level Using Mike Porter's Five Force Analysis

Neha Kesarwani

Research Scholar at CKT College,
New Panvel and Asst. Professor at BNN College, Bhiwandi

Dr. Ashok D. Wagh

Principal at BNN College, Bhiwandi

Naresh Chaudhary

UG Student at BNN College, Bhiwandi

Introduction

Recent years have seen a considerable uptick in the electric vehicle (EV) industry, with several nations setting aspiring goals for EV adoption and the phase-out of internal combustion engine (ICE) vehicles. To reduce the impact of global warming and climate change, a lot of industries are moving towards green transport alternatives. A study by Aravena and Denny (2021) states that one of the most promising ways to significantly reduce the impact of the automobile to air pollution, carbon dioxide emissions, and petroleum dependence is through plug-in hybrid and electric vehicles. Today, efforts are being made on a global scale to improve EV manufacturing.

Objectives

This study aims to analyze the potential of the Electric Vehicles industry in the global market.

Methodology

The study adopts a detailed review of available literature for Electric Vehicle's potential in the market. for the purpose of research data from various companies including TATA, Mahindra and Mahindra etc. which are planning to enter the EV market has been used.

Literature Review

The global electric vehicle (EV) industry is experiencing rapid growth and transformation. The emergence of new technologies, such as electrification, digitalization, autonomy, and connectivity, is reducing the dominance of established automakers and introducing uncertainty about the industry's future shape (Palmer 2023). Start-ups and non-traditional players are entering the market, encouraged by these new technologies (Lu, 2022). The number of EVs on the world's roads has been increasing significantly, with sales reaching an all-time high in 2021 (Mena-Nieto et al. 2023). Revenue in the EV market is projected to reach US\$457.60 billion in 2023, with an annual growth rate of 17.02% (Wongsunopparat and Cherian, 2023). However, EVs still face challenges such as installation, short range, and battery handling. Factors



influencing consumer adoption of EVs include battery quality, availability of charging stations, competitive pricing, government policies, and brand reputation. Overall, the EV industry is poised for continued growth and development, driven by clean energy, improved performance, and government incentives.

1. Snapshot of EV industry

Currently the CAGR of the EV industry for the period 2021 to 2030 is 18.2% (Jadhav and Kumar, 2020). Leading automakers like Tesla, Nissan, and Volkswagen have made significant investments in EV production and R&D, and regions of Europe and North America currently account for the majority of EV sales. However globally, Tesla is leading the EV race with a market capital of 526.27 billion USD. Over the span of 5 years, the Tesla stocks have been multiplied 8 times (NASDAQ, 2022). The electric vehicle sales in 2021 were twice the sales of 2020 with a record breaking number of 6.6 million globally. Out of total car sales in 2021, about 10% were electric (IEA, 2022).

2. Porter's five force model

2.1. Industry scan

Using Michael Porter's Five Forces Framework, the following analysis provides an overview of the current state of the global EV industry:

2.1.1 Threat of new entrants:

The threat of new entrants is medium in case of the Electric Vehicle industry. The EV industry is still in the process of development and it is a sector which runs on continuous innovation. The players of the EV industry are already well-established car-manufacturing giants. Only the well-established car-manufacturing industries are planning to enter the EVs market. Due to high cost of establishment and brand development it is very difficult for new entrants to enter the market. Tata motors has already prepared many concept EVs such as Tata Avinya, Tata Sierra and Tata Harrier which are under-development to compete in the global market. (Tata motors, 2023) Volvo is planning to go all electric by 2025.

2.1.2 Threat of substitutes:

Threat of the substitutes in the EV market is very high as the EVs have to compete with not only other EVs manufacturing industry but also with fossil-fuel based cars. The unique selling point of EV is being environment friendly but today CNG and methane fuelled cars are being developed to satisfy the pocket-friendly and low-emission car requirement of the customers. Moreover, due to infrastructural development and availability of multiple public transport utilities, EVs have more competitions to face.



2.1.3 Bargaining power of the suppliers

The bargaining power of the suppliers is relatively high as there are limited supply sources for electric vehicles. Currently most of the EVs available in the market run on Lithium-ion batteries. However as per a study by Speirs et al. (2014), the reserves of lithium metal which occurs freely in nature is limited. The geographical distribution of lithium is also irregular. Unless there is an alternative source to power the electricity to the EVs, the supply is expected to remain at a few hands. The viability of EVs depends on crucial components like batteries and charging infrastructure, which are currently dominated by a small number of large providers.

2.1.4 Bargaining power of the buyers

The bargaining power of the buyers is medium. EVs have shown a really high growth in demand over the years. An estimated revenue of 250 billion USD was generated through EV sales globally in the year 2021 (IEA, 2022). There are numbers of diversified products available and the financing facilities such as leasing and EMIs creates a continuous demand of EV for the manufacturers. However, customers are expecting lower costs for EVs.

2.1.5 Rivalry between competitors

The rivalry between EV competitors is very high as the traditional car manufacturers and big automobile industries are electrifying their products. Due to low entry barriers, many start-ups are in the process of creating electric automobiles. Automobile industry has always been competitive and the EV sector is no different. After Toyota's 1.15 billion USD investment in the EV sector, Mahindra and Mahindra, an Indian based automobile giant is planning to set up an EV manufacturing unit of 1.2 billion USD (Chakraborty, 2022).

3. Impact of Covid-19 on EV industry

Covid-19 affected almost all kinds of business organisations and the EV sector also faced the burn. During Covid-19 lockdowns were imposed all over the world crippling the transport systems. As per a study by Wen et al. (2021) during 2020 most of the EVs that are manufactured in China are dependent on imported parts. Travel restrictions imposed by the country led to slow-down of EV manufacturing as the inventory for production was too low. Due to supply chain delays, decreased customer demand, and economic uncertainty, EV sales have slowed significantly as a result of the Covid-19 epidemic. However, in 2021, the EV sales were all time high despite the after effect of Covid-19 (IEA, 2022).

4. Future of EVs v/s conventional cars, are EVs really green?

Growing popularity of EV and the limited source of fossil fuel shows that EV is actually the future of the automobile industry. Day by day more people are preferring EVs over



conventional cars. The road transport industry is responsible for about 16% emissions worldwide, however EVs are attempting to decarbonise this sector by providing an alternative to fossil-fuel based vehicles (IEA, 2022). However, most of the electricity is sourced through thermal power on the global scale. EVs may be effective in reducing the road transport emission, but the electricity sourced for its engine is still producing the carbon emissions. Disposal of EV batteries is also one of the environmental issues related to EVs.

5. Conclusion

In conclusion, newcomers to the EV market are expected to encounter a variety of obstacles, from a weak supply chain to low consumer demand. Electric automobile manufacturers will be able to produce more economically competitive products if the supply chain is encouraged to become more localised. In addition, governments should encourage financing for EVs, which will lower the cost of EV procurement, and assist the growth of the EV manufacturing supply chain in India. The global EV market is expected to increase significantly over the next several years as a result of technological advancements, falling prices, and rising consumer desire for eco-friendly transportation solutions. The long-term picture for the EV business is still favourable despite the difficulties brought on by the COVID-19 pandemic. Accordingly, EVs are expected to play a bigger part in lowering greenhouse gas emissions and tackling climate change.

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