IJRAR.ORG E-ISSN: 2348-1269, P-ISSN: 2349-5138

INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS (IJRAR) | IJRAR.ORG

An International Open Access, Peer-reviewed, Refereed Journal

Investment Opportunities and Challenges for EV Vehicle Manufacturers and Suppliers in India's Two-Wheeler Market

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Abstract: In recent years, the Indian automotive industry has seen a significant shift towards sustainable transportation and electric vehicles (EVs). This shift has created investment opportunities and challenges for EV manufacturers and suppliers in India's two-wheeler market. As a result, this study has been undertaken to explore and analyze these opportunities and challenges and offer recommendations for the stakeholders to navigate this burgeoning market.

Keywords: Electric Vehicle, EVs, Two-Wheeler

I. INTRODUCTION

The manufacturing and use of electric cars (EVs) are becoming increasingly important in India's constantly changing automotive industry. The two-wheeler segment, in particular, has seen a surge in demand for EVs, owing to factors such as rising fuel prices, increasing awareness about the environment, and government incentives. As a result, the Indian two-wheeler EV industry has drawn the attention of numerous manufacturers, suppliers, and investors. This review paper aims to provide an in-depth analysis of the investment opportunities and challenges faced by EV vehicle manufacturers and suppliers in India's two-wheeler market.

To achieve the objective of this paper, we will conduct a comprehensive review of existing literature on investment opportunities and challenges faced by EV vehicle manufacturers and suppliers in India's two-wheeler market. We will examine relevant case studies, reports, and articles to understand the current landscape of the Indian two-wheeler EV market, and identify the factors that influence investment and growth opportunities for EV manufacturers and suppliers.

We will also analyze the challenges faced by these entities, such as government policies, infrastructure limitations, and competition from traditional internal combustion engine (ICE) vehicles. We will explore how these challenges impact investment decisions, and identify strategies that companies can employ to overcome these barriers.

In summary, this review paper aims to provide a comprehensive understanding of investment opportunities and challenges for EV vehicle manufacturers and suppliers in India's two-wheeler market, based on existing literature and research.

Objective of Study

- To analyze the investment opportunities for EV vehicle manufacturers and suppliers in India's two-wheeler market, in light of the growing demand for EVs and government incentives and policies.
- To identify the challenges faced by EV vehicle manufacturers and suppliers in India's two-wheeler market, including issues related to charging infrastructure, battery technology, and competition from traditional gasoline-powered two-wheelers.

- To present case studies of successful EV vehicle manufacturers and suppliers in India's two-wheeler market and analyze the strategies employed by these companies to overcome challenges and seize investment opportunities.

II. MAJOR INDUSTRY PLAYERS

1. Hero Electric: Hero Electric is an Indian company that started its operations in 2007. It is one of India's biggest producers of electric two-wheelers, with a market share of over 35%.[1] To advance environmentally friendly transportation and lessen pollution, the corporation entered the EV market. Currently, the company offers a wide range of electric two-wheelers, including scooters, motorcycles, and bicycles, with various battery capacities and charging options. Hero Electric has more than 600 dealerships throughout India and is concentrating on growing its distribution network.[2]

2. Okinawa Autotech: Okinawa Autotech is another Indian company that started its operations in 2015. The company is focused on developing sustainable and affordable electric two-wheelers. It currently holds a market share of 20% and provides a variety of electric scooters with various battery sizes and charging configurations.[3] To help its customers, the business is also building a charging infrastructure. Okinawa Autotech is focused on expanding its product portfolio and plans to launch new electric vehicles in the near future.

3. Ather Energy: Ather Energy is an Indian electric vehicle startup that started its operations in 2013. The company is focused on developing premium electric scooters with advanced technology and features. Currently, it has a market share of around 15.5%[4] and offers two electric scooter models, the Ather 450X and the Ather 450 Plus. To support its customers, Ather Energy has created the Ather Grid charging network. The company is focused on diversifying and expanding its product portfolio and plans to launch new electric vehicles in the future.

4. Revolt Motors: Launched in India in 2019, Revolt Motors is a startup in the electric vehicle industry. The company focuses on developing electric motorcycles with cutting-edge features and technology. It currently holds a market share of about 3%[5] and offers the Revolt RV400 and Revolt RV300 electric motorcycle models. For a seamless riding experience, Revolt Motors has also created a special battery swapping technology The company is focused on expanding its product portfolio and plans to launch new electric vehicles in the future.

5. TVS Motor Company: Established in 1978, TVS Motor Company is a leading two-wheeler manufacturer in India. By launching its electric scooter, the TVS iQube, in 2018, the company entered the EV market. Currently, the company only accounts for about 19.5% of the market for electric two-wheelers.[6] TVS Motor Company is focused on expanding its product portfolio and plans to launch new electric vehicles in the future.

6. Bajaj Auto: Established in 1945, Bajaj Auto is another leading two-wheeler producer in India. The company entered the EV industry in 2019 with the launch of its electric scooter, the Bajaj Chetak. Currently, the company only accounts for about 1% of the market for electric two-wheelers.[7] Bajaj Auto is focused on expanding its product portfolio and plans to launch new electric vehicles in the future.

7. Yamaha Motor India: Yamaha Motor India is a subsidiary of the Japanese multinational corporation Yamaha Corporation, which has been in business since 1955. With the release of their electric scooter, the Yamaha Fascino 125 Fi Hybrid, the business joined the EV market. Currently, the company only accounts for about 3.87% of the market for electric two-wheelers.[8] Yamaha Motor India is focused on expanding its product portfolio and plans to launch new electric vehicles in the future.

III. INVESTMENT OPPORTUNITIES FOR EV VEHICLE MANUFACTURERS AND SUPPLIERS

The two-wheeler market in India has seen a surge in demand for electric vehicles (EVs) in recent years. In spite of the COVID-19 pandemic, sales of electric vehicles (EVs) climbed by 20% in India in 2020, according to a report by the Society of Manufacturers

[1] Shukla, Harsh. "Electric Scooter Maker Hero Electric Raises ₹2.2 Billion in Series B Funding - MERCOM India." *Mercomindia.com*. Mercom India, 16 July 2021. Web. 09 May 2023.
[2] "Hero Dealers, Showrooms in India @91wheels." 91Wheels. 91Wheels, n.d. Web. 09 May 2023.
[3] Moneycontrol.com. "Business News Today: Stock and Share Market News, Economy and Finance News, Sensex, Nifty, Global Market, NSE, BSE Live IPO News." *English*. n.d. Web. 09 May 2023.
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[8] Bandhu, Atul. "Suzuki vs Yamaha Two Wheeler Sales in October 2022." *TimesNow*. TimesNow, 7 Nov. 2022. Web. 09 May 2023.

of Electric Vehicles.[9] According to the survey[10], two-wheelers make up the majority of EVs sold in India, with over 143,837 units sold overall in the financial year 2020–21. Given the rising awareness about environmental sustainability and the availability of affordable EVs on the market, this trend is anticipated to continue.

The Indian government has been encouraging the use of EVs through a number of programs and incentives. The Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME)[11] program was introduced in 2015 with the goal of offering financial incentives for EV purchases.To encourage the production and adoption of EVs in India, the program was upgraded in 2019 with a budget of Rs 10,000 crore ($1.3 billion).[12] Additionally, the government has set a target to achieve 30% electric mobility by 2030, which presents a significant investment opportunity for EV vehicle manufacturers and suppliers.[13]

EV vehicle manufacturers and suppliers can benefit from the growing demand and government incentives by investing in research and development of new EV models, expanding their production capacity, and setting up charging infrastructure. According to a report by Deloitte[14], India has the potential to become one of the largest EV markets in the world with a projected sale of 10 million EVs by 2030. For businesses in the EV industry, this creates a substantial investment potential. The government has also launched initiatives such as the National Electric Mobility Mission Plan[15] and the Bharat EV Charger Challenge[16] to encourage the development of charging infrastructure and promote innovation in the EV industry.

In summary, In conclusion, the government's push for electric mobility and the rising demand for EVs in India's two-wheeler sector create a sizable investment opportunity for EV car makers and suppliers. Companies can benefit from investing in research and development, expanding their production capacity, and setting up charging infrastructure to tap into the potential of the EV market in India.

IV. CHALLENGES FOR EV VEHICLE MANUFACTURERS AND SUPPLIERS

The two-wheeler EV industry in India has tremendous growth potential, but it also poses a special set of difficulties for suppliers and producers of EVs. The following are some of the major difficulties that market participants face:

- Charging Infrastructure:
  One of the biggest challenges faced by EV manufacturers and suppliers in India is the lack of charging infrastructure. Customers have been significantly discouraged from purchasing EVs due to the lack of suitable charging station infrastructure. While the Indian government has launched various schemes and initiatives to promote EVs and set up charging infrastructure, the progress has been slow. According to a paper[17] by Alvarez and Marsal, a global professional services firm, released in July 2022, “The global ideal EV/public chargers ratio is also around 6-20 EVs per public charger, whereas, in India, it currently stands at an estimated 135.” This has resulted in range anxiety among consumers, making them hesitant to switch to EVs.

- Battery Technology:
  One of the most crucial parts of an EV is its battery, yet the technology used to create them is still in its nascent stages. When compared to conventional gasoline-powered cars, which can cover much greater distances before refueling, EVs' short range is a significant drawback. While the cost of batteries has been declining, they still make up a significant portion of the cost of an EV, which makes them unaffordable for many consumers. Additionally, manufacturers now rely heavily on imports due to the lack of domestic production of EV batteries, which drives up costs.

- High Upfront Costs:
  EVs are still more expensive than conventional gasoline-powered cars, which keeps many Indian consumers from purchasing them.Even though the price of EVs has been falling, they are still considerably more expensive than conventional two-wheelers. According to a report by McKinsey[18], EVs are currently priced at a premium of around 30-50% compared to gasoline-powered two-wheelers. This high upfront cost has resulted in low sales of EVs in India.

- Competition from traditional gasoline-powered two-wheelers:
  Traditional gasoline-powered cars, which are more accessible and affordable, dominate the two-wheeler market in India. The lack of consumer awareness and education about the benefits of EVs has made it challenging for EV manufacturers

[9] “EV Sales Report for FY 2020-21 by SMEV • Evreporter.” *EVreporter*. 13 Dec. 2021. Web. 09 May 2023.
[10] Ibid
[11] “Fame India Introduction - Press Information Bureau.” *Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India*. Ministry of Information and Broadcasting, 11 July 2022. Web. 09 May 2023.
[12] Ibid
[13] Ibid
[14] Woodward, Michael, et al. “Electric Vehicles.” *Deloitte Insights*. Global Automotive, 28 July 2020. Web. 09 May 2023.
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[16] Kant, Amitabh, et al. Niti Aayog. Print.
[17] *Electric Vehicles Spotting the Challenges & Charting the Course* 2022: n. pag. Print.
[18] Baik, Yeon, et al. “Making Electric Vehicles Profitable.” *McKinsey & Company*. McKinsey & Company, 8 Mar. 2019. Web. 09 May 2023.

to compete with gasoline-powered two-wheelers. In addition, the lack of after-sales service centers and trained technicians for EVs has resulted in low consumer confidence in the technology.

The two-wheeler market in India is dominated by conventional gasoline-powered cars, which puts EV producers and suppliers up against stiff competition. Only 4% of two-wheeler sales in India in 2021 were EVs, according to a report[19] by the Automotive Component Manufacturers Association of India (ACMA). This highlights the challenge of shifting consumer preferences towards EVs, particularly in a price-sensitive market like India where the cost of ownership and maintenance is a key consideration.

In conclusion, the Indian two-wheeler market presents EV vehicle manufacturers and suppliers with a number of investment opportunities, but they must also address the issues preventing the industry's expansion. The government, manufacturers, and other stakeholders must work together to develop the necessary infrastructure, battery technology, and reduce the upfront costs of EVs to make them more accessible to consumers. The two-wheeler sector in India has the capacity to change and pave the way for a sustainable future by overcoming these obstacles.

V. CASE STUDIES

In this section, we present case studies of successful EV vehicle manufacturers and suppliers in India's two-wheeler market. By analyzing the strategies employed by these companies, we can gain insights into how they have overcome the challenges and seized investment opportunities.

One such successful company is Ather Energy, which has established itself as a leading manufacturer of premium electric scooters in India. Ather Energy was founded in 2013 and launched its first electric scooter, the Ather 450, in 2018. Scooters made by the firm are renowned for their cutting-edge technology, innovative designs, and excellent performance. Additionally, Ather Energy created the Ather Grid charging network, which at the moment has more than 1000 charging stations spread across more than 80 Indian cities.[20]

Ather Energy places a strong emphasis on research and development as one of its main strategies. The business has spent a lot of money on its own proprietary technology, including its battery management system, motor, and charging infrastructure. By developing its own technology, Ather Energy has been able to differentiate itself from competitors and offer superior products to consumers. Another strategy employed by the company is its emphasis on customer experience. Ather Energy offers home charging, doorstep service, and a mobile app that allows users to track their vehicle's performance and get support. These value-added services have helped the company to build a loyal customer base.

Hero Electric is yet another successful business in India's EV two-wheeler market. Founded in 2007, Hero Electric is one of the oldest and largest electric two-wheeler manufacturers in India. The company, which is well-known in both the consumer and business markets, provides a variety of electric bikes and scooters. In India, Hero Electric has so far sold more than 500,000 electric two-wheelers.[21]

One of the key strategies employed by Hero Electric is its focus on affordability. A wider audience can purchase the company's products because they are priced similarly to gasoline-powered two-wheelers. Hero Electric has also developed a substantial network of dealerships and service facilities throughout India, which has helped to build trust with customers and provide them with convenient access to sales and service. Another strategy employed by the company is its partnership with the government of India. Hero Electric has taken part in a number of government programs designed to encourage the use of electric vehicles, including the Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles (FAME) scheme.[22] By aligning itself with the government's goals, Hero Electric has been able to access funding and other resources to support its growth.

These case studies demonstrate that success in the EV vehicle manufacturing and supply industry in India requires a combination of innovation, customer focus, and strategic partnerships. By analyzing the strategies employed by successful companies such as Ather Energy and Hero Electric, other companies in the industry can gain insights into how to overcome challenges and seize investment opportunities.

VI. FUTURE OUTLOOK

The two-wheeler market in India for EVs appears to have a bright future, with significant room for expansion and innovation. The Indian government has set ambitious goals to achieve a 100% electric two-wheeler fleet by 2025, which will drive demand for EVs in the country. According to a report[23] by PR Newswire, the Indian electric two-wheeler market is expected to grow at a compound annual growth rate of 44% from fiscal year 2020 to 2025, reaching a market size of 5.2 million units by the end of the forecast

[19] Advisory, Corporate & Government, Yes Bank, and Automotive Component Manufacturers Association of India (ACMA). New Delhi: Automotive Component Manufacturers Association of India (ACMA), 2021. Print.
[20] Jha, Shakti Nath. “Ather Energy Installs 1,000+ Fast Charging Grids across 80 Cities in India.” *The Financial Express*. The Financial Express, 16 Feb. 2023. Web. 09 May 2023.
[21] Gupta, Surajeet Das. “E-Two-Wheeler Sales Ride Past 500,000-Mark in 2022, Penetrate 4% of Market.” *Business Standard*. Business Standard, 27 Dec. 2022. Web. 09 May 2023.
[22] Ibid
[23] ---. “The Electric Two-Wheeler Market in India Is Expected to Grow at a CAGR of over 44% during the Period 2019-2025.” PR Newswire: press release distribution, targeting, monitoring and marketing. 17 Apr. 2020. Web. 05 May 2023.

period. Additionally, the government's 'FAME II' scheme, which offers incentives for the use of electric vehicles, is anticipated to accelerate the growth of the EV market.

There is also significant potential for innovation in the EV market, particularly in the areas of battery technology and charging infrastructure. The development of affordable battery technology is helping to address the significant obstacle of the high initial cost of EVs. For instance, Ampere Vehicles, a Coimbatore-based EV manufacturer, has developed swappable lithium-ion batteries that are more cost-effective than traditional lithium-ion batteries.Similar to this, there is a growing trend toward the development of charging infrastructure, with businesses like Ather Energy and Revolt Motors establishing charging networks throughout India's major cities. With the increasing demand for EVs and the focus on innovation, the future of the EV market in India's two-wheeler segment looks promising.

However, there are also challenges that need to be addressed for the sustainable growth of the EV market. Major challenges that need to be overcome include the absence of a standardized charging infrastructure and a well-established supply chain for electric vehicle components. Traditional gasoline-powered two-wheelers continue to dominate the Indian two-wheeler industry, therefore competition from these vehicles is still a problem. Nevertheless, with the government's focus on promoting EVs and the increasing awareness and acceptance of EVs among consumers, the future of the EV market in India looks bright.

VII. CONCLUSION

In conclusion, the Indian two-wheeler market is expanding significantly, and there has been a substantial change in recent years toward electric cars. As a result, there are lots of chances for EV vehicle suppliers and manufacturers to develop and grow their businesses in India.

However, there are also challenges that must be taken into account. The expansion of the EV market in India is being hampered by a lack of suitable charging infrastructure, high upfront prices for users, and limited government incentives and assistance. Additionally, traditional two-wheeler manufacturers have already established themselves in the market, presenting a competitive challenge to new entrants in the industry.

Despite these challenges, there is a strong financial rationale for investing in the Indian market for electric two-wheelers due to the rising need for affordable, environmentally friendly transportation options. Long-term success is likely for manufacturers and suppliers who can successfully traverse the difficulties and seize the opportunities given by this sector.

In order to achieve success in this market, it will be essential for companies to engage in market research and analysis, as well as to develop innovative products and business models that can effectively address the unique needs and challenges of the Indian market. To establish the necessary infrastructure and policy framework to support the expansion of the EV industry in India, cooperation with governmental organizations and other stakeholders will also be essential.

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[4] Baik, Yeon, et al. “Making Electric Vehicles Profitable.” *McKinsey & Company*. McKinsey & Company, 8 Mar. 2019. Web. 09 May 2023.

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[21] Woodward, Michael, et al. "Electric Vehicles." *Deloitte Insights*. Global Automotive, 28 July 2020. Web. 09 May 2023.