

## ELECTRIC VEHICLE INDUSTRY IN INDIA

### INTRODUCTION AND BACKGROUND

- Transport is a fundamental requirement of modern life, but Petrol or diesel vehicles are highly polluting while electric vehicles (EV) have zero tailpipe emissions and are much better for the environment.
- The running cost of an EV is much lower than an equivalent petrol or diesel vehicle. EVs use electricity to charge their batteries instead of using fossil fuels like petrol or diesel. The use of EVs can help in reducing carbon footprint due to zero tailpipe emissions.
- EVs have very low maintenance costs and servicing requirements are lesser than the conventional petrol or diesel vehicles. Therefore, the yearly cost of running an EV is significantly low<sup>1</sup>.
- Prime Minister Narendra Modi made the pledge, to cut carbon emissions to net zero by 2070 in COP26 summit at the Glasgow.<sup>2</sup>
- EV adoption will help India to fulfil its global commitments to lower carbon emissions and increase use of cleaner sources of energy and transportation as required by the Nationally Determined Contributions (NDCs) under the [UN Framework Convention on Climate Change](#) (UNFCCC) and [EV30@30](#).
- The adoption of EVs is expected to create 10 million new jobs in India by 2030, in turn boosting economic growth of the country. Electric vehicles sold until 2030 can cumulatively save 474 million tons of oil equivalents over their lifetime, worth US\$207.33 billion.
- The domestic electric vehicle industry will cross sales of 10 million vehicles by 2030, with an overall adoption rate of more than 30 per cent across different vehicle categories, says a study, 'Unlocking India's electric mobility potential'.

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<sup>1</sup> <https://e-amrit.niti.gov.in/benefits-of-electric-vehicles#:~:text=Electric%20vehicles%20are%20more%20efficient,electric%20vehicles%20more%20eco%2Dfriendly.>

<sup>2</sup> <https://www.bbc.com/news/world-asia-india-59125143>

- According to a study by Arthur D Little released on 16th June 2022, EV adoption for passenger vehicles is likely to be just 10 per cent by the end of the period, amounting to a strikingly small 5 per cent of total EV sales and to attain more than 30 per cent EV adoption, India will require approximately 800 GWh of batteries by 2030.
- The EV industry in India is picking pace with 100% FDI possible, new manufacturing hubs, and increased push to improving charging infrastructure. Federal subsidies and policy favoring deeper discounts for Indian-made electric two-wheelers as well as a boost for localized ACC battery storage production are other growth drivers for the Indian EV industry. Moreover, in September 2021, a production-linked incentive scheme for the automotive sector was approved by Cabinet to boost the manufacturing of electric vehicles and hydrogen fuel cell vehicles. India reported sales of over 300,000 EV units in 2021<sup>3</sup>.
- The number of registered vehicles across India was around 295 million in fiscal year 2019. Vehicle registrations grew at a compound annual growth rate of over ten percent between fiscal years 2007 and 2019.<sup>4</sup>

### **PRESENT STATUS:**

- The Indian automotive industry is the fifth largest in the world and is slated to be the third largest by 2030. Catering to a vast domestic market, reliance on the conventional modes of fuel intensive mobility will not be sustainable. In an effort to address this, policymakers are developing a mobility option that is “Shared, Connected, and Electric” and have projected an ambitious target of achieving 100 percent electrification by 2030.
- India stands to benefit on many fronts by making the shift towards electric vehicles (EVs), it has a relative abundance of renewable energy resources and availability of skilled manpower in the technology and manufacturing sectors.
- In terms of investment, given Foreign Direct Investment (FDI) inflow of nearly USD 6 billion in 2021, India's EV industry could attract further foreign investments of about USD 20 billion by 2030, to fuel the country's economic growth and help achieve required scale in this industry, as per the study.
- Despite the obstacles, India is one of the largest markets for EVs in Asia behind only China and surprisingly, ahead of Japan

### **CHALLENGES**

- **High costs:** Along with the range anxiety (kms/charge), another major concern among the potential customers is the current high price of EVs. As compared to lower-end (internal combustion engine) ICE cars, electric cars in the same segment tend to be more expensive. This is mainly because of the higher cost of technology used in the EVs, which constitutes a substantial portion of the cost, not leaving much scope for other features usually available in premium cars.
- With the recent announcement of subsidies, the price rationalization of EVs in the two-wheeler segment is on cards. Since the government’s fast-changing priorities are now biased towards sustainable, clean electric mobility, industry watchers expect a similar push towards easing adoption of other electric vehicles like cars and buses soon.
- **Insufficient charging infrastructure:** In 2019, there were only 650 charging stations in India as

<sup>3</sup> <https://www.india-briefing.com/news/electric-vehicle-industry-in-india-why-foreign-investors-should-pay-attention-21872.html/>

<sup>4</sup> [https://morth.nic.in/sites/default/files/Annual%20Report\\_21-22-1.pdf](https://morth.nic.in/sites/default/files/Annual%20Report_21-22-1.pdf)

against over 0.3 million in China. Lack of sufficient charging infrastructure is one of the primary reasons why customers often refrain from purchasing EVs.

- **Limited options:** Since it is still a budding industry in India, customers have a very limited range of products to choose from. Increased investment in the sector will make it more competitive in due time and this will help create further demand.
- **Lower mileage:** Since the industry is young, there is immense scope for R&D. As of today, EVs in India are not cost competitive to an average customer as internal combustion engine (ICE) vehicles prove to be more cost effective.
- **Higher dependency on imports:** Reliance on imports of battery as well as other components is also one of the factors adding to the cost of EVs in India.
- **Grid challenges:** Another concern is regarding the price of charging EVs at private charging stations once EVs become mainstream. According to Brookings India, projections for 2030 show that even with a fair penetration of EVs, the increase in demand for electricity is likely to be about 100 TWh (tera watt-hours) or about four percent of the total power generation capacity. So, increasing methods of power generation are necessary to meet that growth in demand.
- According to an independent study by CEEW Centre for Energy Finance (CEEW-CEF), the EV market in India will be a US\$206 billion opportunity by 2030 if India maintains steady progress to meet its ambitious 2030 target. This would require a cumulative investment of over US\$180 billion in vehicle production and charging infrastructure<sup>5</sup>.
- Another report by India Energy Storage Alliance (IESA) projects that the Indian EV market will grow at a CAGR of 36 percent till 2026. The EV battery market is also projected to grow at a CAGR of 30 percent during the same period. To meet this rising demand, India is accelerating plans to manufacture Lithium-ion cells within the country, anticipating USD 2.3 billion in government subsidies and more than USD 7.5 billion in investment potential, it said.
- According to NITI Aayog, by 2030, 80 percent of two and three-wheelers, 40 percent of buses, and 30 to 70 percent of cars in India will be electric vehicles. Simply put, industry experts maintain this would mean 102 million EVs that would need deployment of 2.9 million public chargers.
- Nevertheless, while growth in the EV industry is on an upward tick, it has much ground to cover to be able to realize the government's ambitious 2030 target. The COVID-19 pandemic not only slowed the industry's progress, but also dampened overall market demand. Still, market sentiment has retained positivity in some segments. In FY 2020, EV sales for two-wheelers in India increased by 21 percent. For EV buses, the sales for the same period increased by 50 percent. In contrast, the market for electric cars remained grim, registering a five percent decline. As for total EV sales, after suffering an initial setback in 2020, sales appear to be slowly picking up. In January 2021, 15,910 units of EVs were sold in India, and out of these, the maximum units were sold in Uttar Pradesh, followed by Bihar and Delhi.

## **OPPORTUNITIES**

- Niti Aayog's report "India's Electric Mobility Transformation", pegs EV sales penetration in India at 70 percent for commercial cars, 30 percent for private cars, 40 percent for buses, and 80 percent for two- and three- wheelers by 2030.
- **Launch of 'e-AMRIT' portal:** The Government has rolled out the website e-AMRIT – <https://www.e-amrit.niti.gov.in/> – at the COP26 Summit in Glasgow, which will function as a one-stop destination for

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<sup>5</sup> <https://cef.ceew.in/solutions-factory/publications/financing-india-transition-to-electric-vehicles>

all information on electric vehicles. It addresses key concerns about the adoption of EVs and their purchase – such as charging facility locations and EV financing options as well as information about investment opportunities, government policies, and available subsidies for drivers and manufacturers.

- **Existing EV ecosystem in India and investment outlook:** India's EV space is at a nascent stage regardless of the country's ambitious targets. However, India offers the world's largest untapped market, especially in the two-wheeler segment. 100 percent FDI is allowed in this sector under the automatic route.
- **Faster Adoption and Manufacturing of Hybrid and Electric Vehicles in India (FAME):** The Government recently moves to amend the FAME II scheme to make electric two-wheelers more affordable. Under the phase two of the FAME scheme, about 1,65,000 electric vehicles have been supported, as on November 25, 2021, by way of demand incentive amounting to about INR 5.64 billion (US\$75.16 million). Further, under the scheme, approvals have been granted for 6,315 electrical buses, 2,877 EV charging stations amounting to INR 5 billion (US\$66.63 million) in 68 cities across 25 states/Union Territories and 1,576 charging stations amounting to INR 1.08 billion (US\$14.39 million) across nine expressways and 16 highways<sup>6</sup>.
- **Production-linked incentive (PLI) schemes:** In May 2021, the government rolled out a PLI Scheme for ACC Battery Storage Manufacturing, which will incentivize the domestic production of such batteries and reduce the dependence on imports. This will support the EV industry with the requisite infrastructure and will significantly cause a reduction in cost of EVs.
- The Government approved a PLI Scheme for the automobile and drone industry on September 15, 2021, which intends to incentivize high value advanced automotive technology vehicles and products, including 'green automotive manufacturing'.
- **Charging infrastructure in India:** Recently, Sterling and Wilson Pvt Ltd (SWPL), India's leading engineering, procurement, and Construction Company announced its entry into the electric mobility segment in India. It has signed a 50-50 joint venture with Enel X, to be incorporated on April 1, 2021, to launch and create innovative charging infrastructure in India. There have also been positive developments in the expansion of charging infrastructure across the country – states like Andhra Pradesh, Uttar Pradesh, Bihar, and Telangana are setting impressive targets for the deployment of public charging infrastructure to increase uptake of electric vehicles in the country.
- **Recent Developments:**
  1. Many leading battery producers like Amara Raja Batteries, have picked up the cue from these incentives to orient new investments into green technologies, including in lithium-ion batteries.
  2. One of the world's most energy dense batteries at 54MWh, developed by a Bengaluru-based battery startup – Pravaig, was acquired by a European renewable energy company, Eren Groupe, for its storage applications. Having a high density implies that the battery gives more power per atom, proving to be cost-effective when compared with alternatives such as sodium-ion or aluminum air. The developers of the battery have also informed that it takes just 30 minutes to fully charge a battery. This new acquisition by a European company will not only give boost to domestic manufacturing, but will also make pave way for making EVs more economical, considering batteries usually account for 35-40 percent of the total cost.
  3. Many leading industry players like OLA Electric Mobility Pvt, Ather Energy, and Mahindra Electrics are rapidly growing their market presence. Moreover, certain states like Karnataka and Tamil Nadu are rolling out innovative and timely investor-friendly policies besides building

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<sup>6</sup> <https://www.india-briefing.com/news/electric-vehicle-industry-in-india-why-foreign-investors-should-pay-attention-21872.html/>

necessary infrastructure.

4. Recently, the Tesla Inc. marked its entry into India by incorporating its subsidiary, Tesla India Motors and Energy Pvt Ltd, in Bengaluru.
5. In February 2021, Ather Energy, India's first intelligence EV manufacturer moved its US\$86.5 million factory from Bengaluru (Karnataka) to Hosur (Tamil Nadu). Ather Energy's factory is said to have an annual production capacity of 0.11 million two-wheelers.
6. In March 2021, Ola Electric, the subsidiary of the unicorn Indian ride-hailing start-up, also announced that it would be setting up the world's largest electric scooter plant in Hosur (which is a two and a half-hour drive from Bengaluru) over the next 12 weeks, at a cost of US\$330 million, and aiming to produce 2 million units a year. By 2022, Ola Electric wants to scale up production to pump out 10 million vehicles annually or 15 percent of the world's e-scooters.
7. Meanwhile, indicative of the market interest for electric two-wheelers in India, Ola Electric reportedly clocked INR 11 billion (US\$149.26 million) in sales over a two-day purchase window.

### **Initiatives of Government of India**

Several fiscal and non-fiscal measures have been put in place to facilitate the adoption of electric mobility by the Government of India. They are as follows:

- **National Electric Mobility Mission Plan 2020 (NEMMP):** It was launched in 2013 by the Department of Heavy Industry (DHI) as a roadmap for the faster manufacture and adoption of EVs in India.
- **FAME Phase I:** As part of the NEMMP 2020, the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles in India (FAME India) Scheme was notified in April 2015, to promote the manufacture of electric and hybrid vehicle technology..
- **FAME Phase II:** Launched in 2019 for a period of three years, this scheme has an outlay of US\$1.36 billion to be used for upfront incentives on the purchase of EVs as well as supporting the development of charging infrastructure. This second phase focuses on supporting electrification of public and shared transportation and aims to support, through subsidies, about 7,000 e-buses, 5,00,000 e-three wheelers, 55,000 e-four wheeler passenger cars and one million e-two wheelers.
- **Amendments to FAME Phase II:** On June 11, 2021, the Ministry of Heavy Industry announced further amendments to the FAME II scheme to give a boost to EV demand among consumers. Under the revised policy, the subsidy per electric two-wheeler (Indian-made), which is linked to the battery size, has been increased to INR 15,000 (US\$204.60) per Kilowatt-hour (KWh) from INR 10,000 (US\$136.40) KWh. Furthermore, electric two-wheeler manufacturers can now give discounts of up to 40 percent to consumers, which is a significant raise from the previous cap of 20 percent. These incentives are expected to significantly lower the purchase price and lift buyer sentiment, creating a spur in market demand<sup>7</sup>.
- **Development of web based open manufacturing technology innovation platforms:** The Ministry of Heavy Industries has developed web based open manufacturing technology innovation platforms under the ongoing Capital Goods Scheme. This includes the development of the key 'mother' manufacturing technologies' indigenously through 'Grand Challenges' on the Platforms to help achieve the vision of an Aatmanirbhar Bharat and a globally competitive manufacturing sector in India.<sup>8</sup>

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<sup>7</sup> [Higher subsidy for electric performance - The Economic Times \(indiatimes.com\)](https://www.economicstimes.com/news/industry/Higher-subsidy-for-electric-performance-1784161)

<sup>8</sup> <https://pib.gov.in/PressReleaseDetail.aspx?PRID=1784161>

- Six Technology Platforms have been developed by IIT Madras, Central Manufacturing Technology Institute (CMTI), International Centre for Automotive Technology (ICAT), Automotive Research Association of India (ARAI), BHEL and HMT in association with IISc Bangalore.
- Online registration on the Technology Platforms can be done at following url: <https://aspire.icat.in>, <https://kite.iitm.ac.in/>, <https://technovuus.araiindia.co.in/>, <https://sanrachna.bhel.in/>, <https://techport.hmtmachinetools.com>, <https://drishti.cmti.res.in/>. Over 60,000 Students, Experts, Institutes, Industries and labs have already registered on these platforms.
- **Ministry of Power:** It has clarified that charging EVs is considered a service, which means that operating EV charging stations will not require a license. It has also issued a policy on charging infrastructure to enable faster adoption of EVs. The revised consolidated Guidelines & Standards for Charging Infrastructure for Electric Vehicles was promulgated on January 14, 2022. It covers land use and access, power tariffs, state and central government roles, timelines for providing connectivity for installation of PCS, among other concerns.<sup>9</sup>
- **Ministry of Road Transport and Highways:** It has announced that both commercial as well as private battery-operated vehicles will be issued green license plates. Notification to this effect was issued on 7th August, 2018. It has also notified that all battery operated, ethanol-powered, and methanol-powered transport vehicles will be exempted from the commercial permit requirement.<sup>10</sup>
- **Niti Aayog:** The National Mission on Transformative Mobility and Battery Storage aims to create a Phased Manufacturing Program (PMP) for five years till 2024, to support setting up large-scale, export-competitive integrated batteries and cell-manufacturing giga plants in India, as well as localizing production across the entire electric vehicle value chain. On April 20, 2022, the think tank released a draft battery swapping policy and invited comments from relevant stakeholders by June 5, 2022. The draft policy is specifically designed for battery swapping systems to be used for two-wheelers and three-wheelers.

### Way Forward

- The scope of India's EV market growth rests ultimately on availability of capital for original equipment manufacturers, battery manufacturers, and charge point operators as well as improvements to infrastructure and diversified options for consumers.
- Realizing India's EV ambition will also require an estimated annual battery capacity of 158 GWh by FY 2030, which provides huge investment opportunities for investors. Enabling policy support measures are a critical need at this juncture.
- The government appears to be aware of this. It has been rolling out incentives to boost market demand in priority segments like electric two-wheelers, and localizing production of key components like ACC battery storage as well as electric vehicles and auto components through respective PLI schemes. Besides, several Indian states have now passed EV policies intending to attract industry investments and make EV adoption more viable proposition for the consumer market.
- Therefore, the country's road to a fully electric ecosystem still has a few hurdles including high cost, inadequate infrastructure, and lack of high performing EVs which are reasons for the slow adoption of electric mobility.

<sup>9</sup> [https://powermin.gov.in/sites/default/files/Final\\_Consolidated\\_EVCI\\_Guidelines\\_January\\_2022\\_with\\_ANNEXURES.pdf](https://powermin.gov.in/sites/default/files/Final_Consolidated_EVCI_Guidelines_January_2022_with_ANNEXURES.pdf)

<sup>10</sup> <https://morth.nic.in/green-initiatives>

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