Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 03, July-September, 2022, pp. 01-04

ELECTRIC VEHICLES: FUTURE OF THE INDIAN AUTOMOBILE INDUSTRIES

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ABSTRACT

Electric mobility is an excellent option for helping India to achieve the sustainable development goals (SDGs) by alleviating traffic congestion and helping in developing resilient cities. The electric vehicles (EVs) industry is growing rapidly around the world. India is no exception, with sales of electric vehicles increasing by over 50% in the last year. EVs are beneficial for both the environment and consumers. EVs have lower emissions than petrol or diesel cars, so they help to reduce air pollution and combat climate change. They are also cheaper to run since we only need to charge them up rather than buying/refilling fuel. While India stands to gain immensely from shifting its transportation away from IC engines and towards EVs, challenges such as a lack of charging infrastructure, higher upfront costs, and a shortage of renewable electricity are also present. One way to overcome these problems is to develop a comprehensive national policy framework for the promotion and deployment of electric vehicles.

***KEYWORDS**: Sustainable Development Goals, Upfront Costs, Make in India.*

Introduction

The Indian automotive industry and automobile manufacturers are working toward a "Make in India" mission for EVs, a Flagship Programme for the National Electric Mobility Mission of the Government of India. To reduce its reliance on fossil fuels and carbon emissions, the government has outlined its ambition of making India an all-electric automobile market by 2031. The government wants 30 percent of all cars sold in the country to be EVs by 2030 [1, 2], and while this goal may appear ambitious, the race is on. India is one of the few countries aiming to see EVs make up at least 30 percent of all new vehicle sales by 2030.

According to India Energy Storage Alliance (IESA), the Indian EV market is expected to grow at an annualized rate of 36 percent. According to the Research and Markets "Indian Electric Vehicles Ecosystem 2030 Outlook", EV sector is expected to grow with a robust CAGR of 43.13% between 2019 to 2030.

The 2020 National Mission for Electric Mobility was launched by the Indian Government in 2012, aiming at improving national fuel security by promoting hybrid and EVs. India launched Go Electric in early 2021 with a view to promoting the uptake of electric mobility vehicles and EVs, as well as to ensuring the country's energy security [3,4]. In 2018, the Ministry of Urban Development launched Green Urban Transport Scheme (GUTS) to curb emissions from public vehicles in India.

Electric Vehicles: An Imperative Need

There are several factors that lead to imperative need for EVs

India has six of the world's top ten most polluted cities. Fossil fuels are primarily to blame for this rise in pollution. The majority of the vehicles in India, including railways and two- and four-wheelers, are powered by fossil fuels [5].

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India imports 86 percent of its crude oil, which means that only 14 percent of the country's energy needs are satisfied domestically and the remainder is imported. However, as these imports call for US Dollars, the Indian Foreign Exchange Reserve is also reduced.

Global Climate Change, Heat Emission, the Paris Climate Accord, and the impact of cutting-edge artificial technology on self-driving cars are just a few of the topics covered. E-vehicles will surely bring about the next major change in mobility.

All these points justify the switch from fossil fuels to e-vehicles. All the developed nations are already making a shift to e-vehicles.

Electric Vehicles Manufacturers in India

- **Mahindra & Mahindra:** Mahindra & Mahindra (part of $19 Billion Mahindra Group) The $19 Billion Mahindra Group sought an opportunity to merge its long-standing car manufacturing expertise with that of leading electric car maker of the country, -Reva Electric Car Company (founded in 1994) and rebranding it as Mahindra Reva Electric Vehicles. The beginning of Mahindra Electric Mobility Limited can be found in 2001 with the introduction of the Mahindra Reva, which is regarded as one of the first electric vehicles in the world and was offered for sale in countries like the UK, Germany, France, and so on. Mahindra Electric's current priorities include producing batteries and enhancing India's EV infrastructure in addition to producing vehicles such the eVerito, eSupro, Treo Zor, and the e2o Plus. [6].

As a matter of fact, Mahindra Electric later launched four electric cars in India’s markets, thus helping out with Indian governments Mission 2030, the India Electric. Mumbai-based multi-national automobile manufacturing firm Mahindra has launched four electric cars in the Indian market. Carmakers such as Hyundai, MG-Motors, Mercedes-Benz, BMW, and others, also launched range of electric vehicles by automakers such as Hyundai to the Indian Government. Hyundai Motors launched the Hyundai Kona Electric vehicle in India, becoming an Electric Car Manufacturers In the India entering Indian electric car market.

- **Tesla:** Tesla, an electric car giant, is also expected to release their vehicles on the Indian Govt. The company is already talking with the Indian Government for opening their Bengaluru units. Ola is also planning to roll out 10,000 e-rickshaws in The Government of India, and is investing in establishing charging stations of EVs in big cities across India.
- **Ashok Leyland:** With its manufacturing of electric passenger buses, commercial vehicle juggernaut Ashok Leyland has also joined the electric vehicle category. Ashok Leyland claims that its electric buses are designed as per Indian conditions and has tied up with Sun Mobility to strengthen its electric mobility domain competency and to implement battery exchanges in the electric buses in order to meet India’s demand for electronic mobility [7].

Ashok Leyland Electric has launched all-electric buses called Circuit in India, enhanced version of non-plug-in HYBUS, Electric Euro 6 truck, and has announced the arrival of the iBUS. Hero Electric started making their own Electric Bike in the year 2007 in their modern production plant located near Ludhiana, Punjab.

- **Tata Motors:** Tata Motors offers a wide range of electric vehicles and has contributed to India’s EV industry with the Tata Tigor Electric car, Ultra electric buses and Star bus hybrid electric buses to provide cleaner, more eco-friendly public transport. Being an essential player in the automobile industry for a couple of decades, like Tata Motors, Mahindra Electric Mobility Limited has made rapid advancements, understanding quickly the demand of electricity-powered vehicles and taking action accordingly.

There are a number of other companies that have launched electric scooters and Electric Bike too in India like Ather Energy, Okinawa Autotech, Atom Electric, Tata Motors, 22 KYMCO iFlow, YOBykes, TVS Electric, and Menza Motors. Other companies that are keen on the lithium battery business in India are Reliance, Suzuki, Toshiba, Denso, JSW Group, Adani, Mahindra, Hero Electric, Panasonic, Exide Batteries, and Amara Raja. Other companies which have products also in the EV market are MG Cars, Maruti Suzuki, Renault, Audi, Volvo, Hero, Ather, etc.

Challenges for the Transition to Electric Vehicles

If we aim to shift towards EV by 2030, as promised by the Modi government, the following challenges need to address.

Charging Stations for e-Vehicles

In India, there are 70,000 gas stations spread in 718 districts. However, there are barely 300 EV charging points in existence. A driver of an electric vehicle would experience a challenging voyage in such a situation. The Government is acting to address this issue, although the pace is rather slow [8].

Higher Cost

The car's on-road cost in the fuel version is between 6 and 7 lakhs. The electric vehicle offered by Tesla, however, starts at 60 lakhs in India. A switch to electric vehicles will only be viable in India because of the country's price-sensitive consumer base.

Lack of Technology

India has a serious technological issue. A 40-liter fuel tank is available in the standard Maruti Suzuki Swift Petrol vehicle. The vehicle can travel up to 600 kilometers at a mileage of 15 km per liter. Similar to this, in terms of technology, will a fully charged vehicle travel the same distance? Ather is a well-known EV business in India. According to the manufacturer, it has a 120 km range on Indian roads when fully charged. [9, 10].

Import of EV Components & Materials

India must import the majority of the components for e-vehicles due to a lack of technological capacity. In an EV, the battery is a key component. All batteries currently use lithium-ion technology. Once more, there are concerns over India's lithium reserves. India is forced to purchase the majority of its battery and electric vehicle (EV) electronic components from China as a result, which has increased its strategic reliance on China [11].

Lack of a Skilled Workforce

India faces a labor shortage when it comes to competent workers for electric automobiles. Because the technology is new and the world's EV technology is evolving, prominent educational institutions struggle to adapt.

Possible Disruption in the Automobile Sector

The potential market disruption would be the biggest issue the automotive industry would confront. Since numerous automakers, like Kia, MG Morris Garages, Jeep, and others have lately expanded into India and made significant investments, the Indian auto industry would be completely disrupted by the introduction of electric vehicles. We must make the switch to electric vehicles gradually and steadily so that current automakers can follow suit.

Initiatives that have been taken for an EV transition

Several initiatives taken by the Government to support EVs production and adoption in India are expected to contribute to achieving the goal of 100% adoption of EVs by 2030. There has also been a positive development with concerning expanding charging infrastructure throughout the country: States such as Andhra Pradesh, Uttar Pradesh, Bihar, and Telangana are setting impressive targets in terms of deployment of public charging infrastructure to boost electric vehicle adoption across the country. India’s EVs Industry India is picking up speed, with 100% possible FDI, new production hubs, and increased efforts towards improving charging infrastructure.

The Government is helping infrastructure development, moving India closer to the goal of becoming a country with an electric car. India’s continued electric car adoption is being driven by the Paris Agreement on reducing carbon emissions, improving urban air quality, and reducing petroleum imports. India’s introduced Faster Adoption and Production of Hybrid Electric Vehicles in India (FAME) program, along with multiple supply-side and demand-side incentives, are intended to promote EVs.

Electric mobility is an excellent way to assist India in achieving India’s sustainable development goals (SDGs) by alleviating traffic congestion and helping develop resilient cities. It is worth noting that adopting EVs is an ample opportunity for lower overall ownership costs, as well as improving financial resilience and profitability for manufacturers. The key for the Indian EV transformation is the mass manufacture of EV components, which would give consumers a simple entry barrier to the electric mobility world. The driving force for India’s EV transition is a commitment towards achieving a zero-emission economy by the year 2070.

Industry experts have estimated India’s clean transformation will require deploying 2.9 million public charging stations in order to accommodate the demand for 102 million EVs. India will require

400,000 charging stations to meet demand of two million electric vehicles on the roads by 2026, according to the Grant Thornton Bharat-FICCI survey. By importing batteries, microcontrollers, engines, and ore, which make up 60% of a vehicles cost, India would be spending more than $65 billion annually on making transportation fully electric.

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