



ELECTRIC VEHICLES: BENEFITS AND ENVIRONMENTAL LEGAL ISSUES

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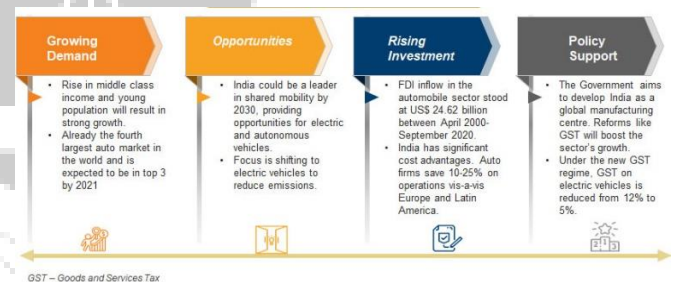
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INTRODUCTION

India, the 5th largest economy in the world has progressed far and wide. The automobile sector has always played a big role in this, in the FY 2015-16 the automobile industry contributed 7.1% to India's GDP. The automobile sector has remained of the most developing sectors of our country with rapid advancement in technology.

OVERVIEW OF THE INDIAN AUTOMOBILE INDUSTRY

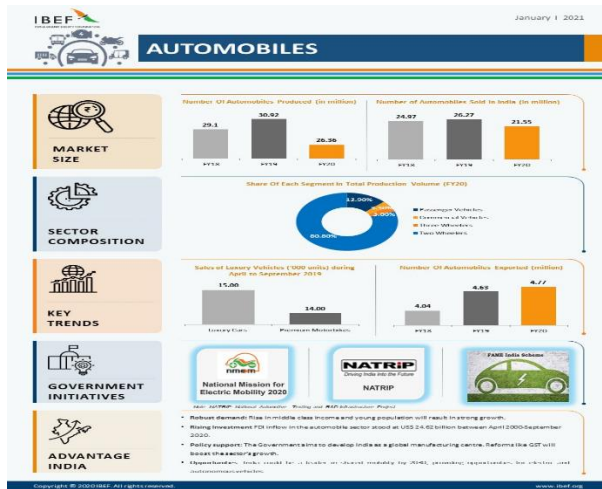
Automobiles have always played a huge role in development of a Nation; it is one of the fastest growing sectors in India. It is the 4th largest in the world and India is one of the largest manufacturers of commercial vehicles and cars.



From 2006 to 2016 the country produced more than 142 million vehicles. The market is dominated by passenger and 2-wheeler vehicles; accounting for more than 80% and 12% respectively, in October 2020 around 3,10,000 units of passenger vehicles were sold which is a growth of 14% compared to October 2019. The exports were 4.77 million vehicles in the FY20.

The biggest car maker with 51% market share in PV was Maruti Suzuki in the FY20, the company sold 1,563,297 units.

makes it compulsory for all vehicles manufactured to follow it.



STATUS OF ELECTRIC VEHICLES IN INDIA AND THEIR IMPACT

In the simplest terms, Electric Vehicles are vehicles which use an Electric motor for propulsion as opposed to an internal combustion engine which uses Petrol or Diesel. According to the IESA, "In the base case scenario, the EV market is expected to grow at CAGR of 44 per cent between 2020-2027 and is expected to hit 6.34-million-unit annual sales by 2027,". Electric two wheelers dominate the sales, while the state governments have been making active effort to increase electric buses for public transportation. The EV market is expected to rise to 50,000 crores by the year 2025

India has become the world's largest tractor manufacturer and 2nd largest in Bus manufacturing, it is also largest manufacturer of Two and three-wheeler vehicles and World's third biggest heavy truck producer and fourth biggest car maker. As per DPIIT, between 2000 and 2020 automobile industry accounted for ~5% of the total FDI in that period, it attracted FDI worth USD 24.5 billion.

Traffic congestion and environmental pollution remain big issues (Automobile's account for 18% of the total CO² emissions), the government is actively trying to reduce emissions; it introduced Bharat stage emission norms in 2000 to deal with the rise in vehicle emissions, in 2018 BS6 was released, it the latest norm and

FAME- The government has launched the FAME; Faster Adoption and Manufacture of (Hybrid and) Electric Vehicles scheme, the main focus of the scheme is to promote electric vehicles by providing subsidies to the customer. It is a Nation-wide mission who's phase 2 has started on 1st April 2019. It is a 3yr mission a budget of 10,000 Crore. "This phase aims to generate demand by way of supporting 7000 e-Buses, 5 lakh e-3 Wheelers, 55000 e-4 Wheeler Passenger









Cars (including Strong Hybrid) and 10 lakh e-2 Wheelers”, says the Department of Heavy Industry; National Automotive Board. FAME aims to reduce pollution and emission by around 2mn tonnes

The government also offers tax incentives on EVs; the GST council offers 12% tax on EV as opposed to 28% on combustion engine vehicles. The EESL; Energy Efficiency Services Limited also works towards early adoption of Electric vehicles

EVs offer various benefits-

NITI Ayog has indicated that we can avoid 37% of the carbon emissions by going electric. Many Indian cities observe poor air quality and high pollution; EVs will not only help reduce air pollution but also Noise pollution as the engines are silent in nature.

Moreover, EVs turn out to be more economical for the masses as opposed to petrol or diesel vehicles; an average electric car costs 70 paise per kilometer as opposed to Rs 3 per kilometer for a petrol car. This also proves out to be more economical for the country as this help reduce the oil imports; India approximately paid 4 trillion rupees on Crude oil imports in the year 2015-16.

	On-board charging (AC)	Off-board charging (DC)	Wireless charging	Vehicle as elec. supply
	●	◐	●	●
	●	●	●	●
	●	◐	◐	●
	●	●	●	●
	●	●	◐	●
	●	●	◐	●
	●	◐	◐	●
	●	●	◐	●

● regulation
 ● voluntary
 ● none
 ◐ partial
 ◌ under development

The global snapshot of the infrastructure attributes of report by *World Forum for Harmonization of Vehicle Regulations* by the Economic and Social Council of United Nations proves that India lacks in infrastructural development. The lack of long range EVs and poor charging infrastructure are one of the main reasons for people being reluctant to shift electric.

POSSIBLE LEGAL ISSUES

HINDERING THE GROWTH OF EV INDUSTRY

Safety remains one of them, in case of an accident if the vehicle catches fire it becomes hazardous to put it out due to Electric batteries, the Lithium-ion batteries have cells in them, which keep catching on fire one by one like a chain reaction.

The recycling and disposal of the Electric battery is also a major issue. The Lithium-ion batteries are more efficient than the Lead acid batteries but they are sensitive to the temperature. The disassembly and recycling of the batteries is not economical, the batteries lose their output power over time and have a fixed number of charging cycles, after which they start to degrade. Some companies like Nissan Leaf provide free battery replacement to

Comparison of different LiB recycling methods Best Worst

	Technology readiness	Complexity	Quality of recovered material	Quantity of recovered material	Waste generation	Energy usage	Capital cost	Production cost
Pyrometallurgy	★★★★	★★★★	★	★★	★★	★★	★★	★★★★
Hydrometallurgy	★★★★	★★	★★	★★	★★	★★	★★	★★
Direct recycling	★★	★	★★	★★★★	★★	★★	★★	★★

	Presorting of batteries required	Cathode morphology preserved	Material suitable for direct re-use	Cobalt recovered	Nickel recovered	Copper recovered	Manganese recovered	Aluminium recovered	Lithium recovered
Pyrometallurgy	★★★★	No	No	★★★★	★★★★	★★★★	★★	No	★★
Hydrometallurgy	★★★★	No	No	★★★★	★★★★	★★★★	★★	★★★★	★★
Direct recycling	★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★

As the above figure denotes, there are various methods of recycling, but the efficient ones are not economical due to their complex process and the cheaper ones are not worth it as opposed to making new batteries.

Various allegations like child labour involved in the extraction of lithium is one of the far-fetched legal issues involved with the EV industry. When it comes to Autonomous EVs, India does not have a codified legislation. If the Self driving cars were to be introduced into the Indian

market, a lot of legal changes would be needed

CONCLUSION

In the coming years, the high price of the EVs as opposed to fuel cars; due to Lithium-ion batteries, will go down will attract more buyers. As of the now the buyers are reluctant to switch due to high investment cost plus lack of charging stations. The government with schemes like FAME is doing an excellent job of promoting EVs but somewhere the implementation is failing.

It is needless to say, in a growing economy like India, the electric vehicle industry has great future, with more and more MNCs investing in the venture, in the upcoming decade there will be a huge change in the Automobile industry of the country.

REFERENCES

- Automobile Industry in India - Auto Sector Growth Analysis, <https://www.investindia.gov.in/sector/auto-mobile> (last visited Mar 23, 2021)
- AUTONOMOUS AND ELECTRIC VEHICLES Promoting Eco Friendly Travel, <https://electricvehicles.in/autonomous-and-electric-vehicles/> (last visited Mar 30, 2021)
- FAME India Scheme, <https://www.pib.gov.in/newsite/PrintRelease.aspx?relid=191377> (last visited Mar 26,

2021)

<https://www.autofutures.tv/2020/12/14/battery-recycling/> (last visited Mar 23, 2021)

- India Electric Vehicle Market Overview Report 2019-2026 India Energy Storage Alliance,
<https://www.indiaesa.info/resources/industry-reports/2605-india-electric-vehicle-market-overview-report-2019-2016> (last visited Mar 25, 2021)
- Lead Acid Battery vs. Lithium Ion: The Detailed Comparison CAR FROM JAPAN,
<https://carfromjapan.com/article/car-maintenance/lead-acid-battery-vs-lithium-ion/> (last visited Mar 30, 2021)
- Part I - Electric Vehicles: Disrupting the Automotive Ecosystem India Corporate Law,
<https://corporate.cyrilamarchandblogs.com/2019/03/electric-vehicles-disrupting-the-automotive-ecosystem-part-1/> (last visited Mar 23, 2021)
- *Principles and Megatrends Affecting Transportation, in The Advent of Unmanned Electric Vehicles: The Choices between E-mobility and Immobility* 1–47,
https://doi.org/10.1007/978-3-319-20666-0_1 (last visited Mar 23, 2021)
- Gavin Harper et al., *Recycling lithium-ion batteries from electric vehicles*, 575 *Nature* 75–86 (2019),
<https://www.nature.com/articles/s41586-019-1682-5> (last visited Mar 30, 2021)
- The \$ 93 billion automotive industry contributes 7.1% to India's GDP,
https://www.indiaonline.com/article/news-top-story/the-93-billion-automotive-industry-contributes-7-1-to-india-s-gdp-116112500195_1.html (last visited Mar 24, 2021)
- The Future of Electric Vehicle Batteries - Recycle, Reuse or Redesign? A Special Report Auto Futures,

