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Why is Electric Vehicle Not Booming In India?

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Abstract: ***The topic for our study is Electric vehicles and the factors which are responsible for their slow growth. We are particularly emphasizing more on its development of electric vehicles and the scope of growth in India. The study also lays down the challenges that electric vehicles as a product are facing. The fact that electric vehicle is recently a global product and a sector that accounts for 16% of global emissions with fewer carbon emissions but still in India the growth is not as exponential as should be and hence the market of the electric vehicle sector is facing challenges in placing the product into population sight. This paper discusses the alternatives for Improving the trend and also establishing a market for electric vehicles in India. Electric Vehicle is a very great alternative for sustainable transportation in a country like India. Our Nation can promote this concept for a better and greener Environment and this study will help us find out the pain points where this sector is lacking In India.***

Keywords: Electric Vehicles, Electrification, Emissions, Automobile, and Environment

I. INTRODUCTION

Electric vehicles first made their presence in the 19th century and used one or more motors for propulsion. Along with other forthcoming motorized technology a long-sighted technology combination of CASE i.e. associated vehicles automated driving and mutual movement is also there. Power in Electric vehicles is provided by a portable battery or other charged Electric Vehicles or a rechargeable device that can be used again. These means of transport are energy proficient, emanating fewer greenhouse gases (GHGs) and radiating lower noise pollution. Along with the united states and European Union, the government efforts to increase electric vehicle adoption rose in the 2000s when the united states and Europe was the vast market for electric vehicle in the 2010s it seen that after COVID 19 green recovery the public is highly enthusiastic regarding the sale of electric vehicle and it seems like there is a substantial growth of the market which can also be seen after awareness and incentives provided by the government. Due to Covid-19 lockdowns, the rate of emissions has majorly gone down which has somehow favored nature. Government should also take more initiatives as stated by the international energy agency 2021 including policies for heavy electric vehicles. Electric vehicle sales are expected to grow from 2% of global sales in 2016 to 30% by 2030.

II. LITERATURE REVIEW

Anil Khurana V.V Ravi Kumar (2019): It was a detailed study on A lot of research is being done around the world to understand how consumers are accepting electric vehicles. Factors considered are the cost, range, and charging time of the electric vehicle, the cost, and availability of the charging time, and cost also play a part in it. The other attributes which are being questioned and looked upon are heavy enticements and anxiety which can be both economic or non-economic. As we know many people are not very used to electric vehicles and are not hugely used by the Indian crowd this also results in minimized knowledge regarding the electric vehicle. The maintenance and functioning costs of electric vehicles are relatively higher than the original opening cost. The other engines which have higher operative costs are also related to combustion.

By Shukla PR, Pathak Minal (2019): This study aims to raise awareness regarding the increased level of emissions from the manufacturing units and the cars, vehicles which are held responsible for the harmful and adverse effects on the environment and also the knowledge and awareness towards people regarding the environmental hazards. The electric vehicle was the concept that was introduced in the automobile industry which dealt with environmental hazards and is to dominate the automobile sector with the passing years.

Yash Sharma, Chahat Goyal Msy,(2019): As we know that the fourth largest industry in the world is the automobile industry which holds 7.1% of India's GDP, and the 2016- 2026 automotive mission plan India. The Indian government aims to reach 12% which is to be the expected figure. To make the Indian automobile industry the highest-growing market in the world the expected figure should reach 12% and per year growth should be 5.9% to reach the INR 16.88-188 billion Industry in the country.

Buses are the most popular mode of transportation in both rural and urban India. Electric Vehicle the demand of the population growth is much more than the supply provided.

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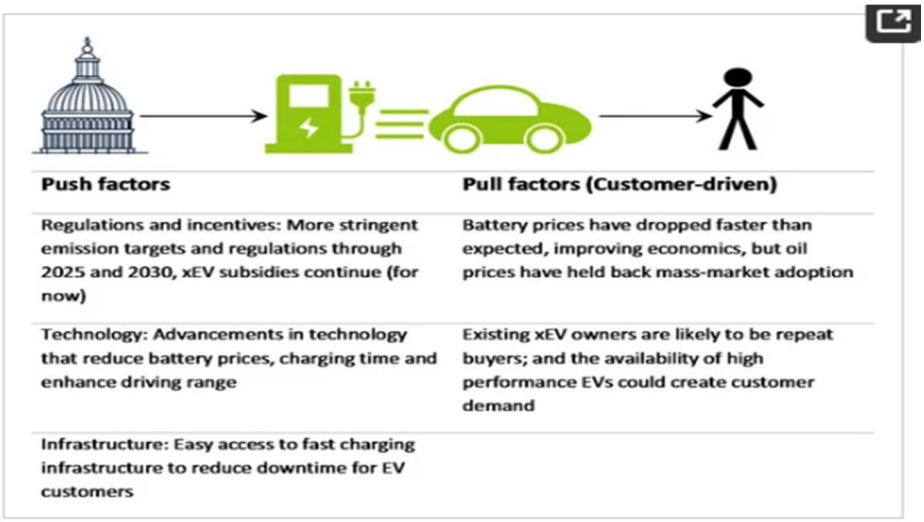
To improve and intensify efficiency and provide a long-term solution a refurbishment of the public transit system is required. Thanks to the government efforts India`s effort to improve the electric vehicle industry and the required makeover which was needed and this is how the automakers differentiate and deliver a unique product. This will catapult some automakers to the next league and, simultaneously, see others fall.



Push factors	Pull factors (Customer-driven)
Regulations and incentives: More stringent emission targets and regulations through 2025 and 2030, xEV subsidies continue (for now)	Battery prices have dropped faster than expected, improving economics, but oil prices have held back mass-market adoption
Technology: Advancements in technology that reduce battery prices, charging time and enhance driving range	Existing xEV owners are likely to be repeat buyers; and the availability of high performance EVs could create customer demand
Infrastructure: Easy access to fast charging infrastructure to reduce downtime for EV customers	

Fig 1: The pull and the push factors regarding Electric Vehicle

A. CO2 Emissions and Electric Vehicles

The expanding fleet of vehicles is reliant on oil (petrol and diesel), and given India's dependence on oil imports, there are price and supply difficulties. Transportation is also a significant source of CO2 emissions. In 2010, transportation accounted for around 14% of all energy-related Emissions of co2. Congestion and air pollution have come from the rising number of cars in metropolitan areas. According to a Central Pollution Control Board analysis, half of the 164 cities tested had a high or critical electric vehicle of PM10, and more than half had moderate or Electric vehicles of NOx. So, Electric Vehicle essentially aids in lowering co2 emissions and a summary of the entire should be implemented.

B. Classification of Electric Vehicle

The different categories of Electric Vehicle are as follows:

The engine runs both on engine and gasoline and has an engine and a motor car and the battery is charged by braking systems electricity. Such Electric Vehicles are known or categorized as Hybrid Electric Vehicles.

Vehicles consisting of smaller engines and larger batteries are charged by an external charging source or braking system known as a Plug-in Hybrid electric vehicle. Vehicles lack an engine and for propulsion, they rely on electric motors and also on outside power or source then it’s known as Plug-in Hybrid or battery electric vehicles.

C. Indian Electric Vehicle Scenario

More than 90% of two-wheeler electric vehicles dominate the Indian industry market. by 2020, the government is planning to eradicate 400,000 passengers 120 million barrels of oil, and 4 million tons of CO2.

D. Electric Vehicle In India

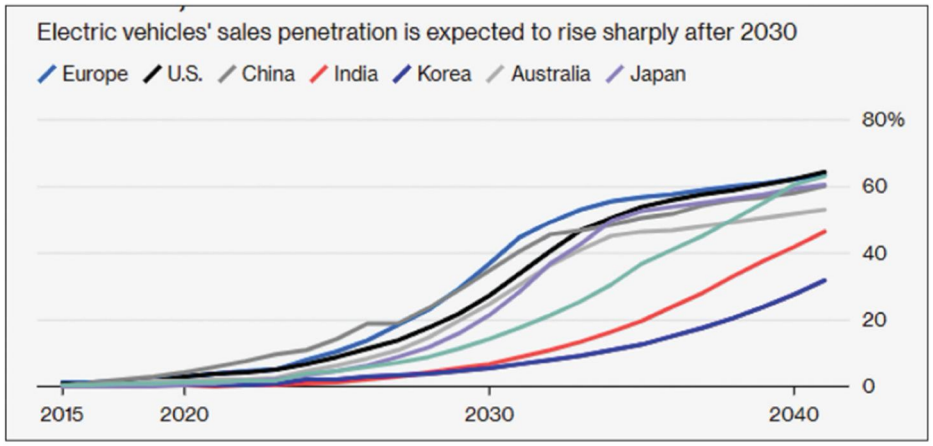
In India, as the trends are shown electric vehicle adoption is gradual, and most people lack driving experience. The cost of maintenance and repairs is considerably lesser, but the initial price is extremely expensive. In contrast, other cars have greater functional costs and have internal combustion engines. One of the factors is the influence of perceived economic benefit (PEB) on adoption. Because there is an increased understanding of EC, this variable is assumed to be influencing the development of renewable energy.

The Indian government has announced that all automobiles must be powered by 2030. The Society of Indian Car Makers (SIAM, 2017) followed up with a white paper estimating that electric vehicles will account for 40% of new vehicle sales by 2030 and 100% by 2047. This historic occasion coincides with the country's 100th anniversary of independence.

E. Future Of Electric Vehicles In India

In the modern period, fossil fuels are the main energy source used to power industry and vehicles. The use of such fossil fuels to produce energy has a significant negative impact on the environment. This is where switching to electric vehicles is necessary (Geurtsen and Wilford 2009). When fossil fuels are burned, heat and electricity are created. By 2040, given the current rate of fossil fuel depletion. Future generations might no longer be able to use them as fossil fuels. Switching to renewable energy sources would be a more sustainable course of action.

When wind turbines are cut off from their main electrical grid, they typically produce very little carbon dioxide, carbon monoxide, mercury, and radioactive material. What an Electric Vehicle the land on which such wind turbines are placed has already been impacted by the land removal necessary for the project. Although solar panels do produce some emissions that contribute to global warming, these emissions are insignificant. In countries with AElectric Vehicle coastal locations where the coastal lines have free-flowing currents, tidal power is a popular energy option. The main risk of tidal energy use is that the water's flow will be altered by the constant harnessing of energy through waves.



III. CHALLENGES FACED BY ELECTRIC VEHICLES IN INDIA

Obstacles Faced by electric vehicle in the Indian market: So according to our study and understanding, we attempted to figure out the fundamental causes for the challenges faced in the Indian market for electric vehicles and it came out to be:

1) Range Anxiety refers to the distance of how many kilometers we can travel in Electric Vehicles on a single charge. Many people desire to drive long with little range worry which is not practical in Electric Vehicle.
2) Customers also want to charge maximum charge in the least time but that is not Achi Electric Vehicle able with the present charging infrastructure.
3) Charge anxiety also refers to locating a charging station when they need to charge which is scarce in India now.
4) Aside from the problem of insufficient infrastructure, there is a huge challenge that overseas investors must overcome inside the electric vehicle markets. The electric vehicle sector in India is in a growing phase and initially, it takes time for consumers to acclimatize.
5) Lack of charging infrastructure and the initial outlay in purchasing scooters is the biggest worry. The initial price of Electric vehicles is roughly 13 lakhs compared to IC engine automobiles which will cost 4. 5 lakhs. This high beginning price is a big entrance hurdle for the Electric Vehicle business to flourish. Government should also offer additional incentives to encourage it as fossil fuels are nonrenewable and emits C02 into the environment.
6) Electric vehicle production is still reliant on importing lithium-ion batteries and IC chips from overseas thus India should start to produce in India to make the price dependable so that cost of producing Electric vehicles will fall.

IV. RECOMMENDATIONS

To enhance the sales of electric vehicles there should be more charging infrastructure, rapid charging stations, and make in India should be applied to decrease the cost, and swappable batteries should be supplied for a longer range. Government should boost knowledge about Electric vehicles and their value to the environment. The person wants to choose ecologically friendly and economical transportation therefore this will enhance the sales of electric vehicles in the next few days. The government should also give incentives to stimulate the sales of electric vehicles.

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V. CONCLUSION

In this article, we have investigated India's policy of adopting Electric cars and fundamentally how COVID-19 as legislation has had a role in the production and selling of Electric cars. We also watched how India addresses the challenges in the production of Electric cars and identified some of the significant pain spots. "The key difficulty is it is extremely difficult to reach the desired spot without tension.

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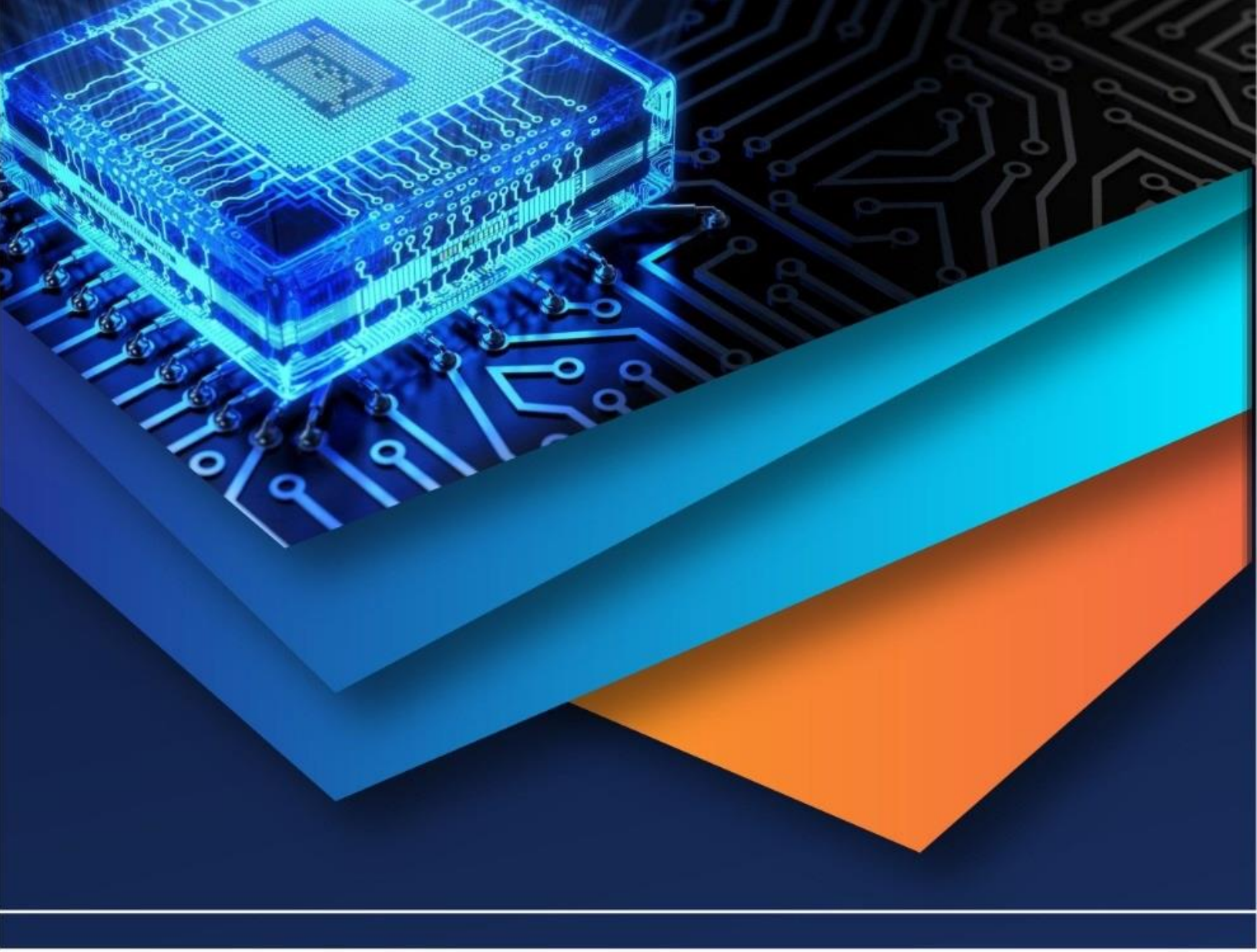

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