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Study on the Future of Electric Vehicles in India

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ABSTRACT: The exploitation and contamination of natural resources have led to a year-round need for renewable and ecologically friendly products. An estimated 300 million registered automobiles, totaling 140.76 billion, are driven every day across the numerous cities of a country like India. Among these goods are electric automobiles. Electric vehicles will take the place of gasoline-powered vehicles. They are one of the emerging practical and ecologically friendly technologies. Switching from an internal combustion engine to an electric one will boost a citizen's potential to profit in addition to reducing pollution across the country. We will look at the possibilities of electric vehicles in India as well as their benefits and drawbacks.[1]

I. INTRODUCTION

Environmental pollution has reached an entirely new level as a result of the usage of non-renewable and harmful sources to produce energy. Information regarding the need to cut carbon emissions has been spread more slowly due to the quantity of pollution, particularly in big polluted cities, and the usage of non-renewable resources. The amount of carbon in the atmosphere has increased since the industrial revolution. Millions of metric tonnes of carbon dioxide are emitted annually from average passenger automobiles. In India, daily oil consumption in November of last year was 5,154 thousand barrels. The use of fossil fuels, particularly petrol and diesel, is the main source of carbon emissions by people. India is one of the many nations that have adopted EVs, particularly in Petro cities. Soon, we'll learn about the potential and difficulties.

In India, the market for electric vehicles (EVs) is beginning to grow. They may be less expensive to operate in the long term than alternatives powered by petrol and diesel while still being ecologically beneficial. Prospective purchasers might be concerned about where to obtain suitable electric vehicle insurance given that India's EV sector is still expanding [2].

Type of Electric Vehicle

1. Battery-powered automobiles (BEVs)
2. Electric hybrid vehicles (HEVs)
3. Vehicle-Power by Fuel Cells (FCEV)[3].

OBJECTIVE OF THE STUDY

1. To study the impact of Electrical vehicles on the future of automobiles in India.
2. To identify the factors influencing the purchasing intentions of electric cars.

RESEARCH METHODOLOGY

"Primary data" for the study was gathered using a standardized questionnaire. Potential consumers (100) valid questionnaires were gathered. The questionnaire consists of (5 items), which are grouped into six categories and connected to each variable.

Which began with demographic factors, buying intention, perceived financial advantages, perceived cost, perceived risk, and perceived environmental benefit were all employed in this study.

II. LITERATURE REVIEW

In a country with the second-largest population in the world—roughly 130 million people, or 17% of the world's population—people are finding it difficult to breathe in most major cities. Air pollution is one of the biggest threats to the world today. India has had significant air pollution issues for the past ten years, and they are only getting worse.[4] Poor fuel quality, old vehicles, poor maintenance, snarled traffic, deteriorating roads, out-of-date automotive



technology, and out-of-date traffic management systems are the main causes of this exponential rise in pollution levels. Cars primarily emit the following pollutants.

Hydrocarbons, particulates, lead, carbon monoxide, sulfur dioxide, and nitrogen dioxide. The sizeable automobile industry in India is to blame for the country's high level of vehicular pollution. Fourth-largest in the entire world. In India, the number of electric vehicles is increasing at a rate of 37.5%. It has been suggested that charging stations be placed in order to maximize their efficiency and deliver the required amount of power. [4].

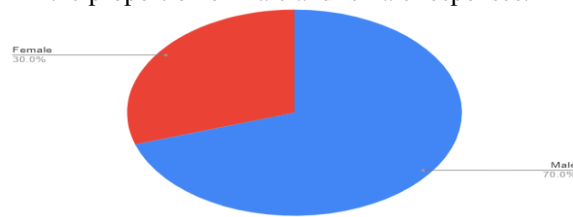
The government is also paying more attention to electric vehicles and charging stations.

II. DATA ANALYSIS AND INTERPRETATION

Sr No.	Measure	Item	Frequency	%
1	Gender	Male	70	70
		Female	30	30
2	Region	Noida	45	45
		Delhi	35	35
		Gurugram	20	20

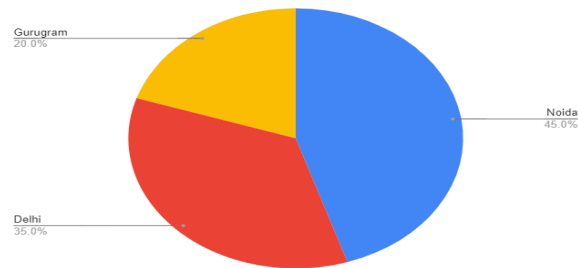
GENDER

60 male replies out of the 100 total respondents, or 60%, were male with 40 female respondents making up 40% of the total. There is hardly any variation in the proportion of male and female responses.



REGION

Noida, Delhi, and Gurugram were the three distinct geographic areas covered by this parameter. Responders from Noida are 45 %. The next group, with a proportion of 35%, is those from Delhi. From Gurugram it's 20%.



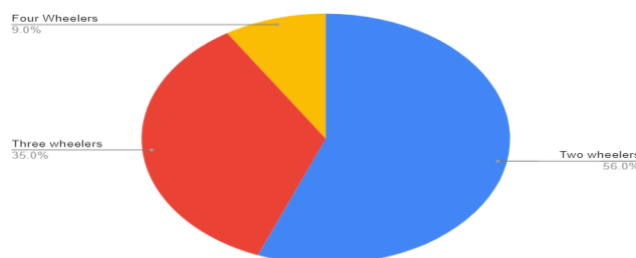
QUESTIONNAIRE

1. What is the current state of electric vehicles in Delhi NCR?

Two-wheeler: 56%

Three-wheeler: 35%

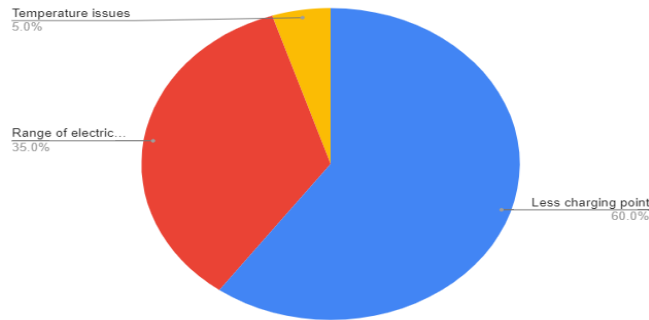
Four Wheeler: 9%





2. What are the major challenges faced by the electric vehicle industry in Noida, Delhi, and Gurgaon?

Less Charging Point: 60%
Range of Electric Vehicle: 35%
Temperature issue: 5%



3. According to customers, Why do the prices of electric vehicles is more than traditional gasoline vehicles in India?

Lithium Batteries and other Materials: 100%

IV. RESULTS AND FINDINGS

- ➔ Lithium-ion batteries cost about \$250/kWh, which equates to about Rs5.7 lakh just in battery costs. An electric car currently costs more than a normal vehicle because lithium-ion batteries make up half of their price.
- ➔ Li-ion batteries are hindered by the protection of the batteries against detonation. For EVs in India, charging presents a major challenge, and a dearth of charging stations may also be taken into account, making them unsuitable or considerably less suitable for long-distance travel.
- ➔ The majority of Indian consumers think an electric car will be ready by 2023, but they also think it won't be readily accessible until 2025
- ➔ India's domestic electric car industry is expected to expand at a 49 percent cumulative annual growth rate (CAGR) between 2022 and 2030, according to the Economic Survey 2023.

V. CONCLUSION

India will gain a lot from converting to EVs as soon as possible. The main benefits include lessening environmental pollution, reducing oil imports, increasing national security, strengthening the economy, and making better use of renewable resources. Emissions from ICE-powered vehicles are responsible for nearly two-thirds of all air pollution. The current ban on older gasoline-powered vehicles in several Indian cities is already positively impacting air quality, and things will only get better as more people switch to EVs[5]. ICE three-wheelers, the main mode of transportation for communities, are now used to transport citizens to bus stops along roads or train stations. These could be quickly converted to electricity, giving towns access to sanitary transportation.

EVs will create new markets in a variety of industries, including storage, strong and lightweight thermoplastics, and higher power consumption. Furthermore, the charging and replacement of EVs would generate a sizable number of jobs nationwide. [5]

Batteries. The Indian government is committed to fostering an environment that is supportive of electric mobility, and as part of the 2019 Union Budget, the government announced a number of significant initiatives to advance electric mobility in India. To motivate. In an effort to boost sales of electric vehicles across the nation, it has been suggested that the GST rate be lowered from the current 12 percent to 5 percent. The interest paid on loans taken out to buy electric vehicles would also be exempt from income tax up to 1,05,00,000 rupees.[5] The transition to electric mobility



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will be smooth and easy because of improvements in EV technology, more stringent environmental regulations, and time-bound initiatives by the government and the auto industry.

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