EV Market Segmentation Analysis

Name : Vansh Sonavane

Introduction

An EV is a shortened acronym for an electric vehicle. EVs are vehicles that are either partially or fully powered on electric power. Electric vehicles have low running costs as they have less moving parts for maintaining and also very environmentally friendly as they use little or no fossil fuels (petrol or diesel). While some EVs used lead acid or nickel metal hydride batteries, the standard for modern battery electric vehicles is now considered to be lithium ion batteries as they have a greater longevity and are excellent at retaining energy, with a self discharge rate of just 5% per month. Despite this improved efficiency, there are still challenges with these batteries as they can experience thermal runaway, which have, for example, caused fires or explosions in the Tesla model S, although efforts have been made to improve the safety of these batteries.

Problem Statement

The objective of this project is to perform Exploratory Data Analysis (EDA) on a dataset of Electric Vehicles (EVs) to gain valuable insights and uncover meaningful patterns. The dataset contains a comprehensive collection of attributes associated with electric vehicles, including but not limited to:

Types of EVs

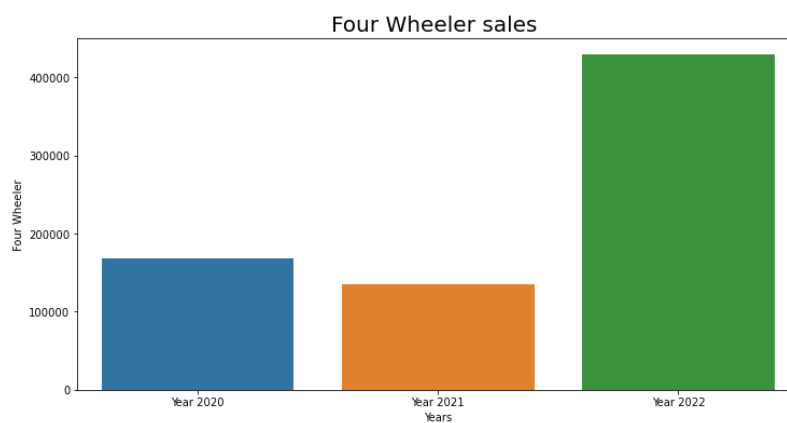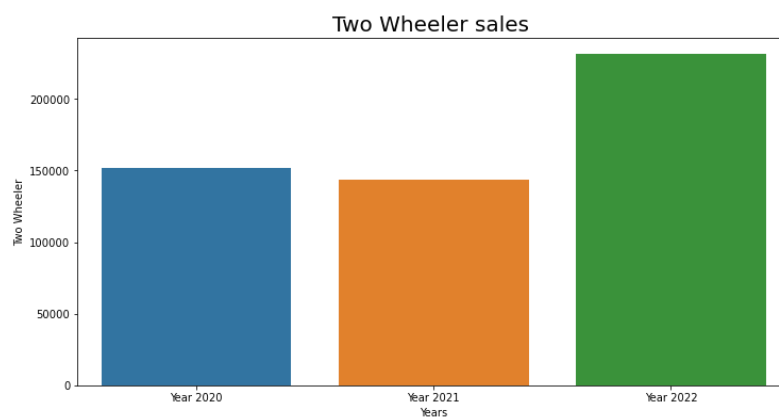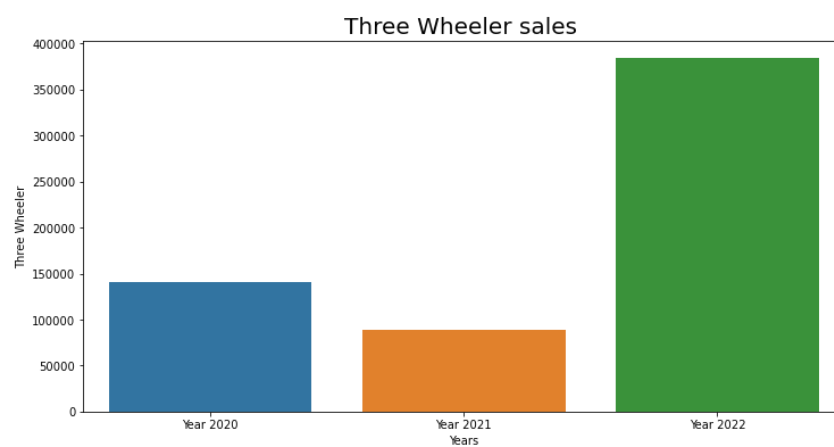Usage of EVs in different states of India

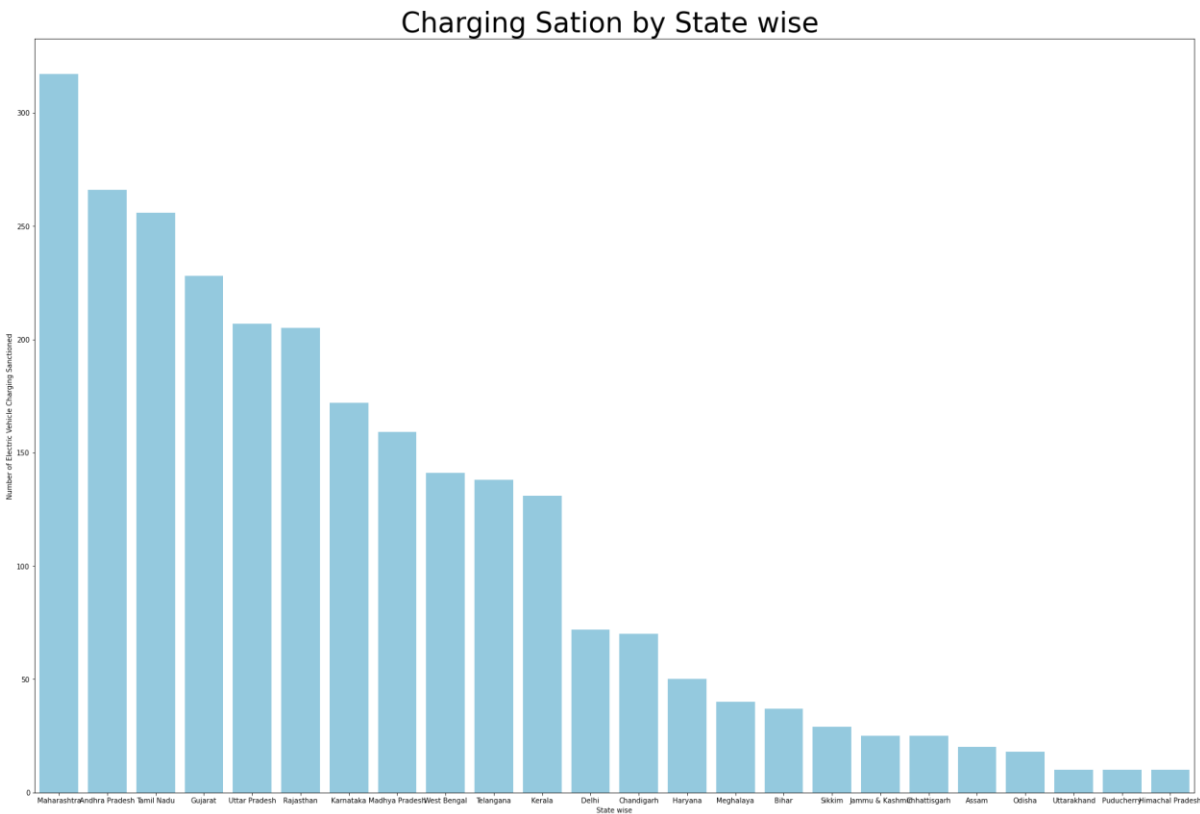Price range of EV models

Battery capacity and performance metrics.

Charging infrastructure and charging time.

Results

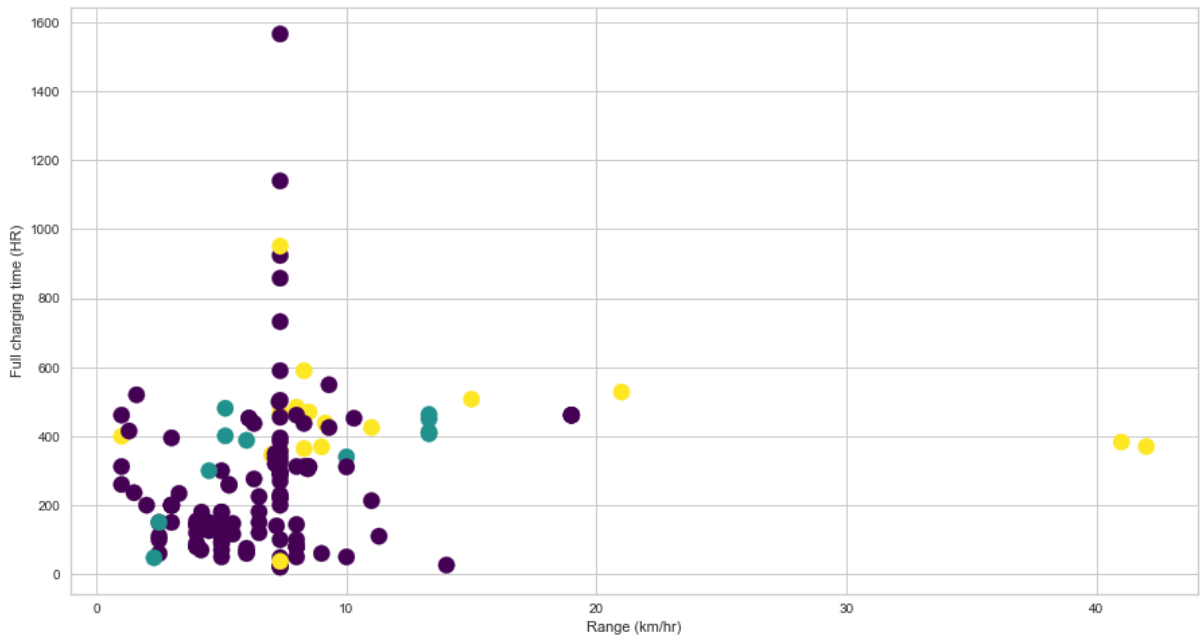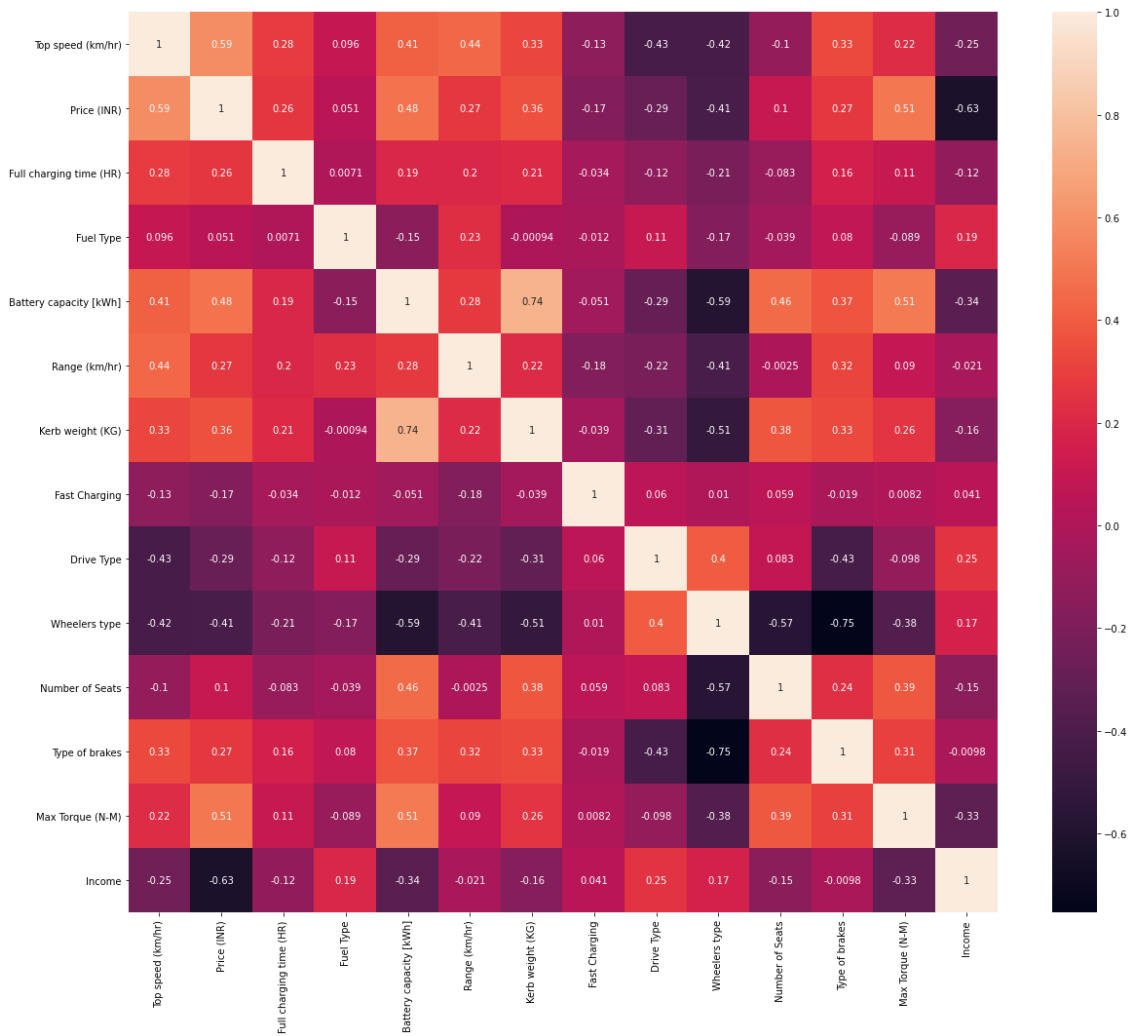- Scalability of EV in recent years compared to that in 2020 and 2021

Three Wheeler sales

Two Wheeler sales

Four Wheeler sales

- Charging Stations in Different States of India
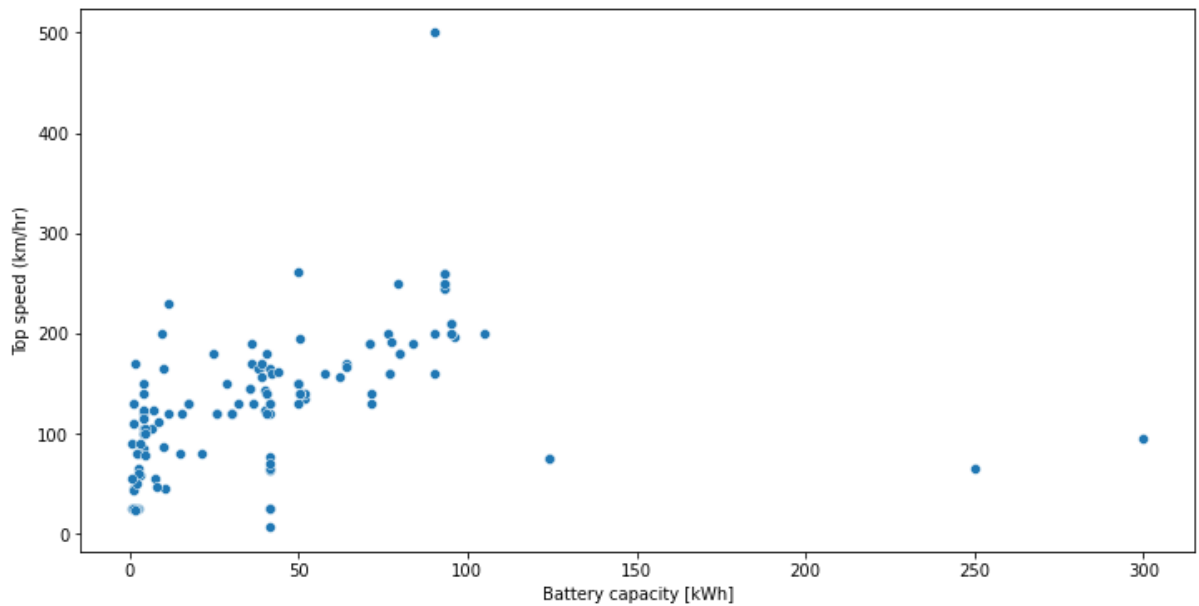

Charging Sation by State wise

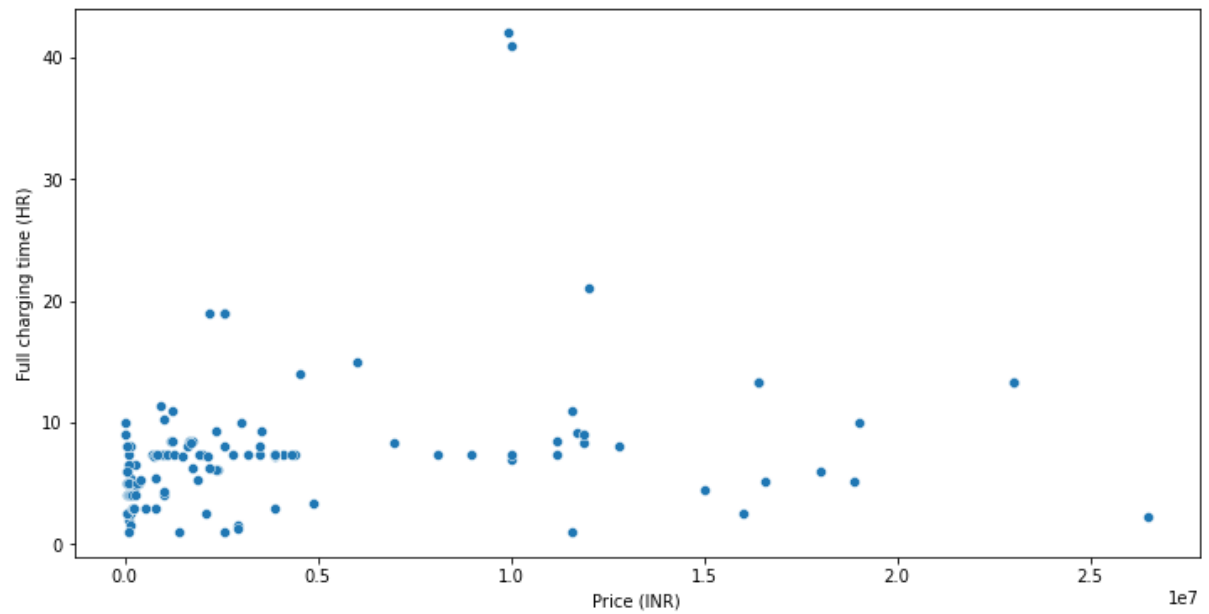- Charging time as per the Range of the Vehicle
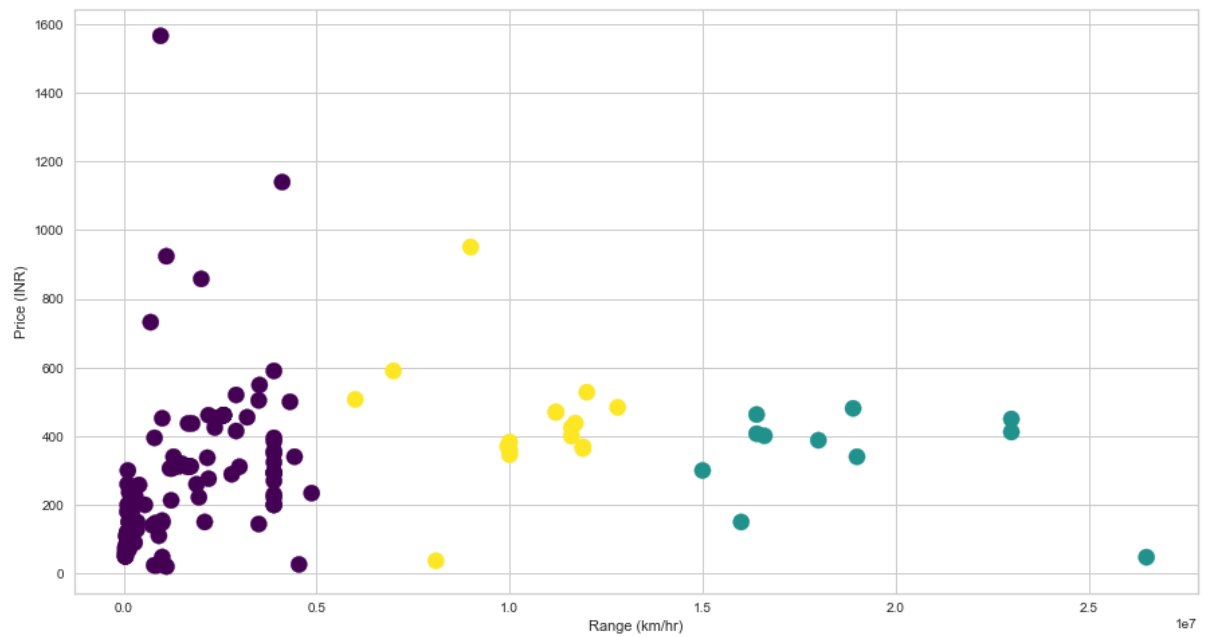
- Heatmap of various attributes

- Efficiency of Top Speed with there respective Battery Capacity

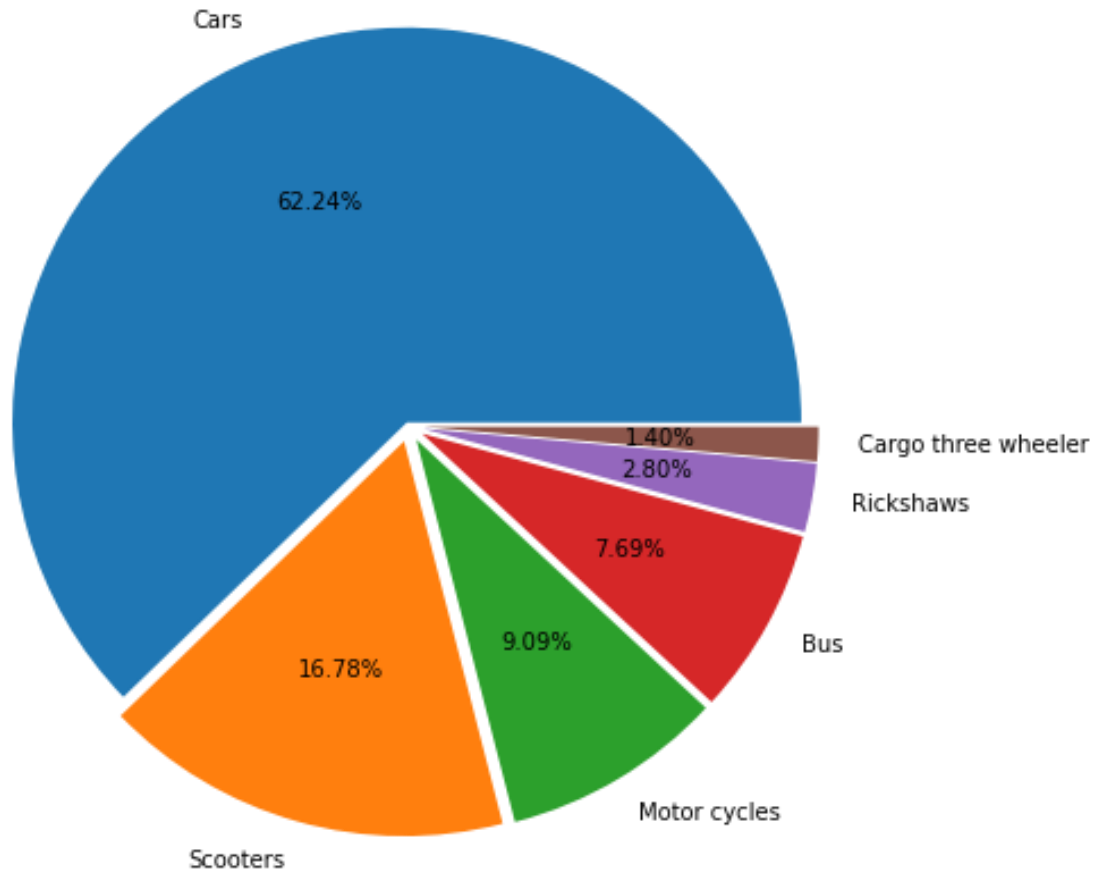- Charging Time pf Vehicles according to there price

- Price of Electric Vehicles according to there Range

- Types of Vehicles

Type of Vehicle

Cars: 62.24%
Scooters: 16.78%
Motor cycles: 9.09%
Bus: 7.69%
Rickshaws: 2.80%
Cargo three wheeler: 1.40%

Conclusion

The penetration of EV in India has Increased Significantly in the last five years as they are more efficient. In addition, growing fuel prices are further helping to boost substantial growth in the product adoption, mainly due to their extended

range and efficiency.

The global Electric Vehicle Market size is projected to grow from 8,151 thousand units in 2022 to 39,208 thousand units by 2030, at a CAGR of 21.7%. Factors such as growing demand for low emission commuting and governments supporting long range, zero emission vehicles through subsidies & tax rebates have compelled the manufacturers to provide electric vehicles around the world.

Increasing investments by governments across the globe to develop EV charging stations and Hydrogen fueling stations along with incentives offered to buyers will create opportunities for OEMs to expand their revenue stream and geographical presence.

From this analysis we create different types of segments to affect consumers' purchasing decisions. Geographic segmentation is about places, cities, states that where consumers live will affect market sales. Like if a consumer lives in a rural area there may be less possibility of having charging stations and vice versa in urban areas. Now in 2022 yet we have only 1742 public charging stations available.

So if a consumer is from those states who have more available charging stations ,the probability of buying is more as compared to others who have less charging stations in their states. Demographic segmentation focuses on education level, family size, occupation, income, etc. since it is based on knowing how customers use your products and services and how much they are willing to pay for them.

That depends on consumers' education, Financial status and purpose of buying EV's. If a customer's purpose is to buy an EV for transporting goods in different cities or states, that customer will focus on the boot space and maximum range of a vehicle. On a psychological segment some customers may go for a product which gives them satisfaction and others may go with a product who is cheaper in cost and their other factors are average.