Project Proposal : Electric Vehicles Market Size Analysis

Start date : 22 July 2024 **End date : Augest 2024**

Introduction :

The electric vehicle (EV) market is undergoing significant growth due to advancements in technology, increasing environmental awareness, and supportive government policies. However, stakeholders often lack comprehensive insights into the market size, trends, and future potential. This project aims to address this gap by providing an in-depth analysis of the EV market.

Project Overview :

The Electric Vehicles Market Size Analysis project will involve collecting, cleaning, and analyzing data to understand the current and projected market size of electric vehicles. The analysis will cover global, regional, and country-specific markets, identifying key trends, growth drivers, and strategic opportunities. The final deliverables will include a detailed report with actionable recommendations and a series of visualizations to communicate findings effectively.

Tools and Technologies :

- **Python**: For data analysis and visualization.
- **Pandas and NumPy**: For data manipulation and analysis.
- **Matplotlib, Seaborn, and Plotly**: For creating visualizations.
- **Jupyter Notebooks**: For interactive data analysis and reporting.

Dataset Description :

We will use this dataset for the analysis: Electric_Vehicle_Population_Data.csv

EV Population Data:

- **Dataset Name:** Electric Vehicle Population Data
- **Source**: User-uploaded dataset containing detailed information about electric vehicles, including their make, model, year, type, electric range, and location.
- **Citation**: This dataset is provided by the user and includes data on various attributes of electric vehicles, such as VIN, county, city, state, postal code, model year, make, model,

electric vehicle type, clean alternative fuel vehicle eligibility, electric range, base MSRP, legislative district, DOL vehicle ID, vehicle location, electric utility, and 2020 census tract.

Dataset Columns

1. **VIN (1-10)**: The first 10 characters of the Vehicle Identification Number (VIN), a unique identifier for each vehicle.
2. **County**: The county where the vehicle is registered.
3. **City**: The city where the vehicle is registered.
4. **State**: The state where the vehicle is registered.
5. **Postal Code**: The postal code of the vehicle registration location.
6. **Model Year**: The year in which the vehicle model was manufactured.
7. **Make**: The manufacturer of the vehicle (e.g., Tesla, Nissan).
8. **Model**: The specific model of the electric vehicle (e.g., Model S, Leaf).
9. **Electric Vehicle Type**: The type of electric vehicle (e.g., Battery Electric Vehicle (BEV)).
10. **Clean Alternative Fuel Vehicle (CAFV) Eligibility**: Indicates whether the vehicle is eligible as a Clean Alternative Fuel Vehicle.
11. **Electric Range**: The maximum range of the vehicle on a full charge, measured in miles.
12. **Base MSRP**: The Manufacturer's Suggested Retail Price (MSRP) for the vehicle.
13. **Legislative District**: The legislative district where the vehicle is registered.
14. **DOL Vehicle ID**: The Department of Licensing (DOL) identifier for the vehicle.
15. **Vehicle Location**: Geographical coordinates (longitude and latitude) of the vehicle's location.
16. **Electric Utility**: The electric utility company servicing the vehicle's location.
17. **2020 Census Tract**: The census tract from the 2020 Census for the vehicle's location.

Project Methodology :

Define Market Scope

- Determine whether the analysis will be global, regional, or focused on specific countries.

Data Collection

- Source data from reputable industry and government sources.
- Collect historical data on EV sales, production, and market adoption.

Data Cleaning and Preparation

- Remove duplicates, handle missing values, and standardize data formats to ensure accuracy and consistency.

Exploratory Data Analysis (EDA)

- Use statistical techniques to understand data distribution, identify outliers, and uncover patterns.

Trend Analysis

- Identify historical trends in EV sales, production, and market adoption.

Market Segmentation

- Segment the market by vehicle type, geography, and other relevant factors.
- Calculate market size and growth rates for each segment.

Forecasting and Scenario Analysis

- Use time series analysis and predictive modeling to forecast future market growth and adoption rates.
- Develop scenarios based on different assumptions to understand potential future developments.

Visualization Development

- Create charts, graphs to communicate key findings effectively.

Final Report and Recommendations

- Compile a detailed report summarizing insights and providing actionable recommendations for businesses and policymakers.

Deliverables :

- **Cleaned and Prepared Dataset:** A refined dataset ready for analysis.
- **Trend Analysis Report:** A report detailing historical trends in the EV market.
- **Segmentation Market Analysis:** Insights into different EV segments and their growth rates.

- **Visualizations:** Charts, graphs to communicate findings.
- **Final Report:** A comprehensive document summarizing insights and providing strategic recommendations.

Evaluation Criteria :

- **Quality of Data Cleaning**: Accuracy and reliability of the prepared dataset.
- **Effectiveness of Analysis**: Depth and clarity of trend and market segmentation analysis.
- **Utility of Recommendations**: Practicality and relevance of strategic recommendations.
- **Impact of Visualizations**: Clarity, relevance, and effectiveness of visualizations in communicating key findings.

Timeline and Milestones :

Week 1 : Define market scope and gather relevant data

Week 2 : Data cleaning and preprocessing.

Week 3 : Exploratory Data Analysis

Week 4 : Conduct trend analysis using historical data, Perform market segmentation and growth rate analysis

Week 5 : Develop visualizations and compile the final report

Week 6 : Review and present findings to stakeholders