

# Global Electric Vehicle Market Analysis using Python (EDA Project)

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Dataset: IEA Global EV Data 2024

## Introduction

This project explores the growth, trends, and impact of the Global Electric Vehicle (EV) Market using data from the International Energy Agency (IEA) Global EV Data 2024. The analysis aims to uncover insights into EV adoption, sales patterns, and the global energy transition using Python-based Exploratory Data Analysis (EDA).

## Dataset Overview

The dataset was obtained from the IEA Global EV Data 2024 report. It contains information on EV sales, stock, charging infrastructure, electricity demand, and oil displacement metrics for multiple countries and years. The key columns include EV stock, EV sales, EV charging points, and related energy measures.

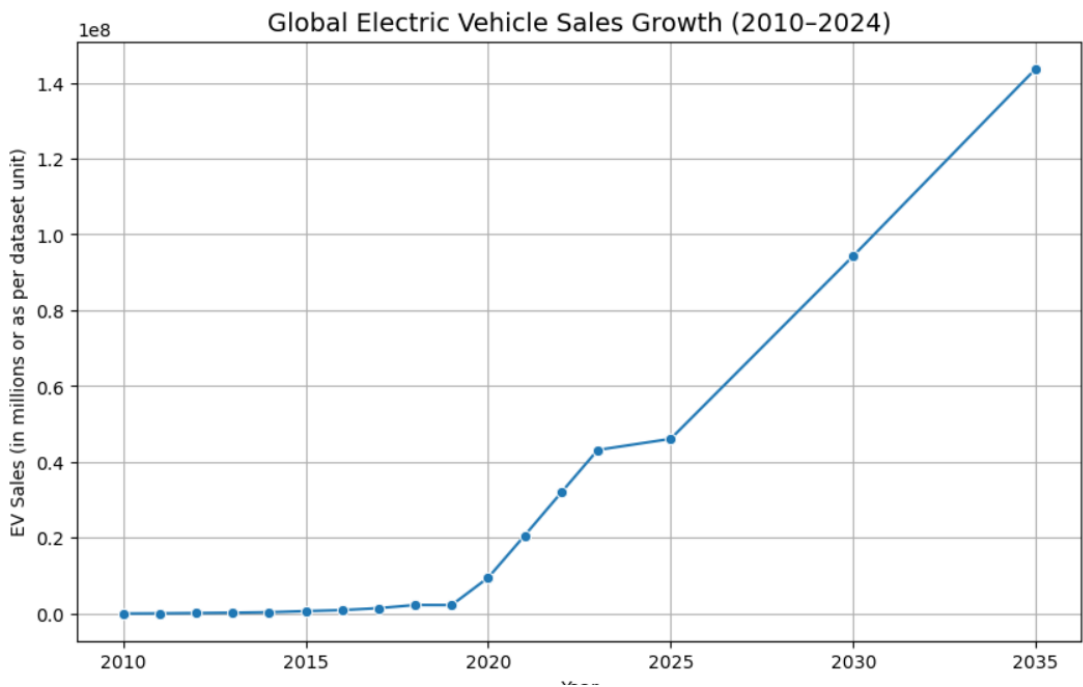
## Data Cleaning & Preparation

Data cleaning involved handling missing values, standardizing column names, and filtering relevant columns. The dataset was then analyzed to identify trends across years, regions, and powertrain types.

# Visualizations & Insights

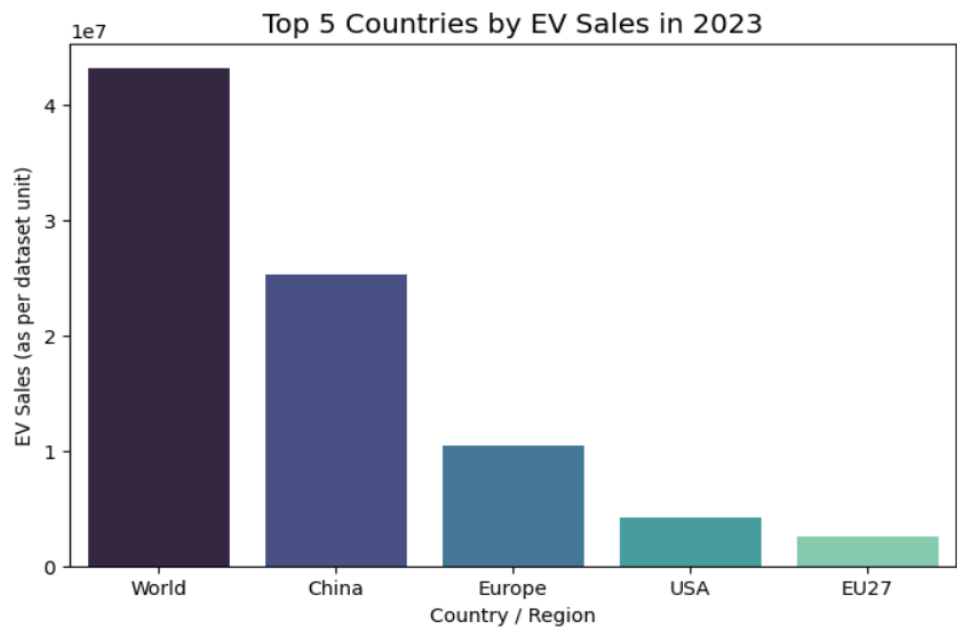
## 1. Global EV Sales Over Time

A line chart showing the rise in EV sales across years globally, highlighting the sharp increase from 2015 onwards.



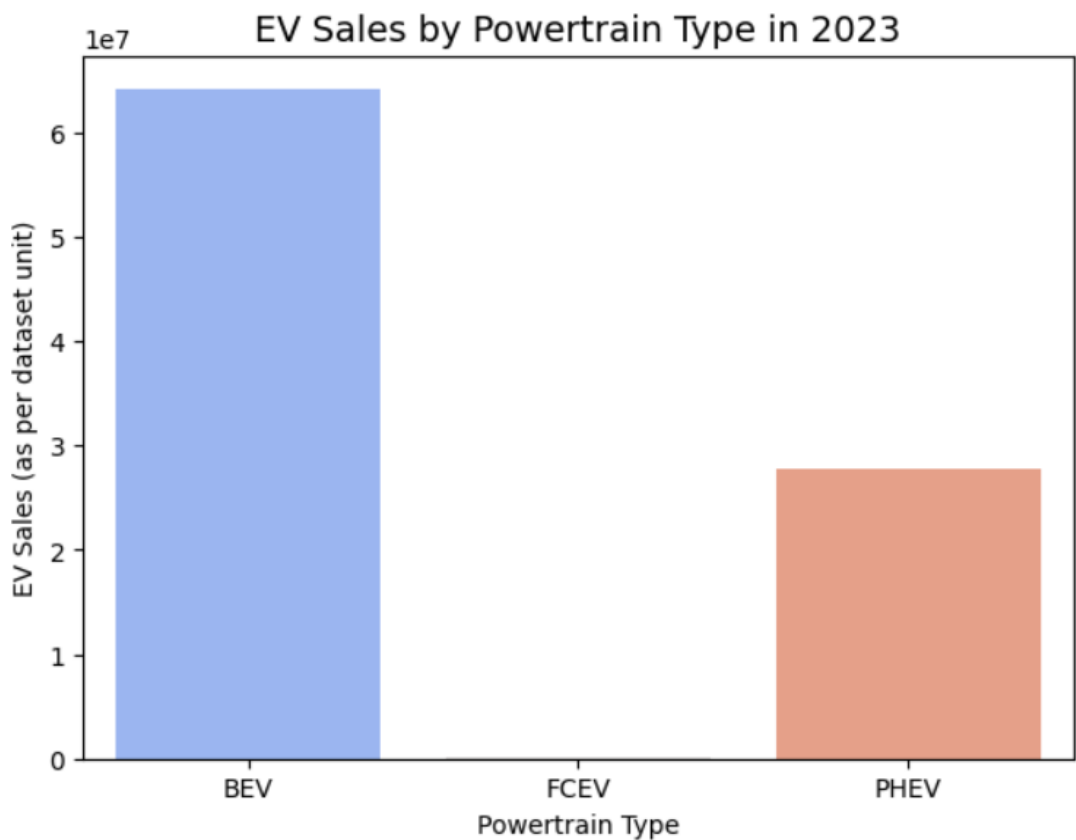
## 2. Top Countries by EV Stock

A bar chart comparing total EV stock among major countries, revealing China, the US, and Europe as the leading markets.



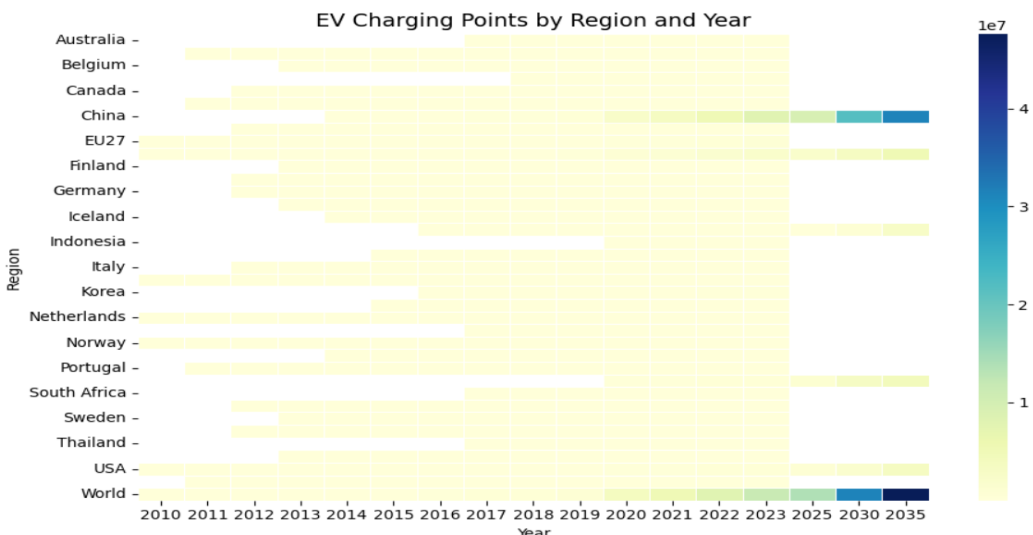
3. EV Market Share by Powertrain Type

A pie chart showing the dominance of Battery Electric Vehicles (BEVs) compared to Plug-in Hybrid Electric Vehicles (PHEVs).



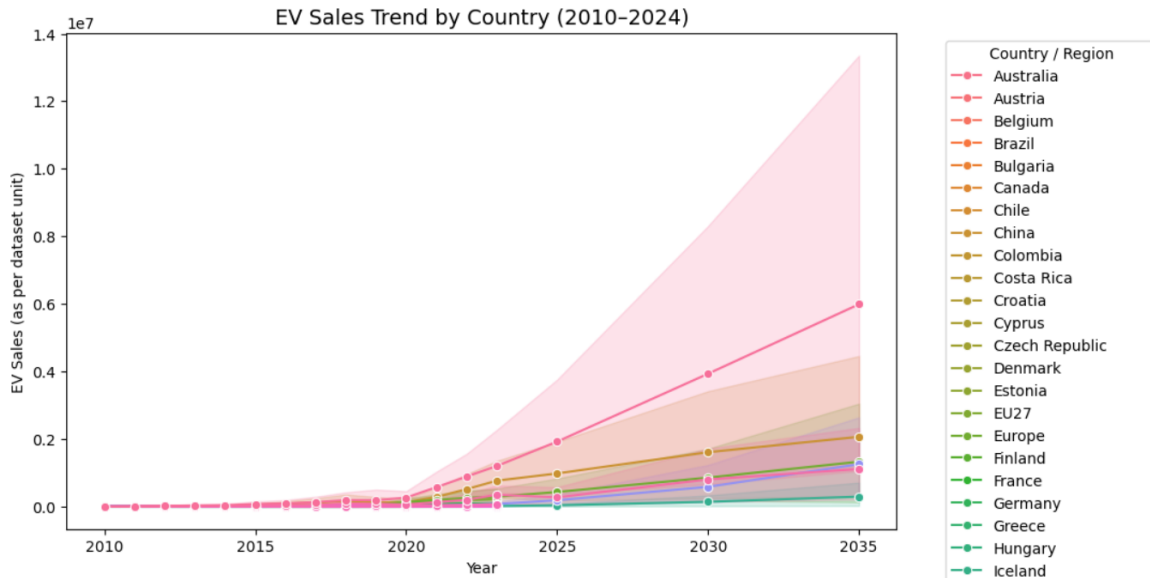
4. Regional EV Charging Infrastructure Growth

A bar/line chart combination illustrating the expansion of EV charging points across key regions over time.



## 5. Correlation Heatmap

A heatmap revealing relationships among variables like EV stock, EV sales, and electricity demand, indicating positive correlations.



### Key Insights

1. EV sales have shown exponential growth, particularly after 2015, due to advancements in technology and government incentives.
2. China remains the global leader in both EV stock and sales, followed by the United States and European nations.
3. Battery Electric Vehicles (BEVs) dominate the market share compared to PHEVs.
4. EV charging infrastructure is rapidly expanding, supporting the shift toward sustainable transport.
5. Strong correlations exist between EV stock growth and electricity demand, demonstrating the impact of EV adoption on energy systems.

### Skills Used

- Python
- Pandas
- Matplotlib
- Seaborn
- Data Cleaning
- Data Visualization
- Exploratory Data Analysis (EDA)