Analyzing the Surge of EVs in Washington State

By: Srihari Raman, Jai Gollapudi, Anoushka Bhatia, Colbe Chang

Introduction

Electric vehicles (EVs) are at the heart of a global shift towards more sustainable and environmentally friendly transportation options. Fueled by growing environmental concerns, rapid technological advancements, and evolving consumer preferences, the move towards EVs represents a critical step in reducing carbon emissions and combating climate change.

This project aims to delve into the EV market in Washington State, uncovering the intricate dynamics fueling its impressive sales growth. By analyzing the factors influencing EV adoption, from policy incentives to infrastructure development and public perception, this project seeks to provide comprehensive insights into the accelerating transition to electric mobility and its broader implications for society and the environment.

Data

The Electric Vehicle Population Dataset from the Washington State Department of Licensing provides a comprehensive overview of currently registered Battery Electric Vehicles (BEVs) and Plug-in Hybrid Electric Vehicles (PHEVs). It includes various attributes like VIN, country of manufacture, city, model year, make, model, electric vehicle type, and electric range. This dataset's breadth allows for an in-depth analysis of EV adoption patterns, technological trends, and market dynamics.

Dataset: Electric Vehicle Population Dataset
Source: https://www.kaggle.com/datasets/yashusinghal/electric-vehicle-population-dataset
Size: 40.4 MB (166801 rows x 17 columns)

Analysis Plan

Data Preprocessing:

- Cleaning: Identify and address missing, incorrect, or outlier data points to ensure the dataset's accuracy.

- Feature Engineering: Create new variables (e.g., vehicle age, region based on postal code) that could provide additional insights.

Exploration:

- Sales Trends: Analyze the growth in EV sales over time, comparing BEVs and PHEVs. Identify seasonal trends or significant spikes in adoption. (Line plots)
- Market Share: Calculate the market share of BEVs and PHEVs among all vehicles and within the electric vehicle market. (Pie chart/bar charts)
- Model Popularity: Determine the most popular EV models and makes, analyzing trends in consumer preferences. (Bar Charts)
- Legislative Influence: Examine how legislative districts with specific policies or incentives for EVs correlate with adoption rates. (Scatter plots)

Group Member Duties

Visualizations

- 1 visualization each (2 for the person doing static)

Everyone:

- Everyone will create 1 visualization, with whoever is doing the static visualizations doing 2 of them
- For the webpage design, all of the group members will meet every week to review what they will be working on and will do so alone through the rest of the week

Reference Papers

1. https://www.iea.org/reports/global-ev-outlook-2023/trends-in-electric-light-duty-vehicles
2. https://medium.com/@luiz.fellix/exploring-the-growth-of-electric-vehicles-in-washington-an-analysis-of-the-electric-vehicle-76e1bcb556f4

Static Images

Image 1: Locations of active electric vehicle chargers in Washington as of June, 2021 (Source)

Image 2: EV Sales and EV Share of Light-Duty Sales from Jan 2021 to Dec 2022 (Source)