

Electric Car Sales Analysis Dashboard

1. Project Overview:

- Objective : The objective of this project is to develop an interactive dashboard that provides comprehensive insights into electric vehicle (EV) adoption trends across the United States. The dashboard aims to help stakeholders — including policymakers, manufacturers, and analysts — monitor EV growth over time, evaluate model performance, understand regional distribution, and assess eligibility for clean alternative fuel programs, ultimately supporting data-driven decisions for sustainability and infrastructure planning.
- Problem Statement :
Businesses, policymakers, and environmental agencies lacked a centralized and visual way to monitor the growth and distribution of electric vehicles (EVs). They needed a tool to quickly understand which cities and counties (like **King County, Seattle**) had the highest EV adoption, what types of EVs were being used (BEVs vs PHEVs), and how many vehicles were eligible for clean fuel programs. This dashboard solves that need by providing clear, interactive insights to support planning, investment, and policy decisions related to sustainable transportation.

2. Data Description:

- Data Source :
The dataset used in this project was sourced from Kaggle, a well-known platform for sharing public datasets. It contains detailed information on electric vehicle registrations, including vehicle type, make, model, model year, electric range, location (city and county), and Clean Alternative Fuel Vehicle (CAFV) eligibility.
- Data Volume :
1,50,422 records, each corresponding to a registered electric vehicle.

- Key Data Fields:
 - Model Year, Make, Model, EV Type (BEV/PHEV)
 - Clean Alternative Fuel Vehicle (CAFV) Eligibility
 - State, City, Electric Range, Base MSRP
- Data Cleaning Process:
 - Removed duplicate VINs and irrelevant fields
 - Handled nulls in Electric Range and CAFV status
 - Standardized EV Type and Make names
 - Converted numeric fields to appropriate types.

3. Target Audience:

This dashboard is designed for:

- EV Manufacturers: Understand which models and makes are leading in market share.
- Government Officials and Policy Planners: Identify states/cities with high adoption for infrastructure planning.
- Environmental Agencies: Evaluate clean vehicle growth and CAFV eligibility patterns.

4. Key Features ;

Total Vehicle Count: 1,50,422 EVs tracked.

EV Types Breakdown:

- Battery Electric Vehicles (BEV): 1,16,750 (78%)
- Plug-in Hybrid Electric Vehicles (PHEV): 33,672 (22.39%)

Interactive Visuals:

- Vehicle count by model year (2012–2024)
- Geographic distribution across states
- Top 10 vehicle makes and models

KPI Metrics:

- Avg. Electric Range: **67.83 Miles**
- CAFV Eligibility:
 - Eligible: 41.81%
 - Not Eligible: 11.86%

- Unknown: 46.33%

Filter Options: CAFV status, EV type, model, state

5. Tools and Techniques :

- Tableau (*used in the actual .twb file*) for dashboard creation
- Excel: Used for initial data cleaning and shaping
- Calculated Fields:
 - % of BEVs/PHEVs
 - Avg. electric range per model
 - % contribution of each make/model
- Map Visualizations: For state-wise vehicle density

6. Project Scope and Limitations :

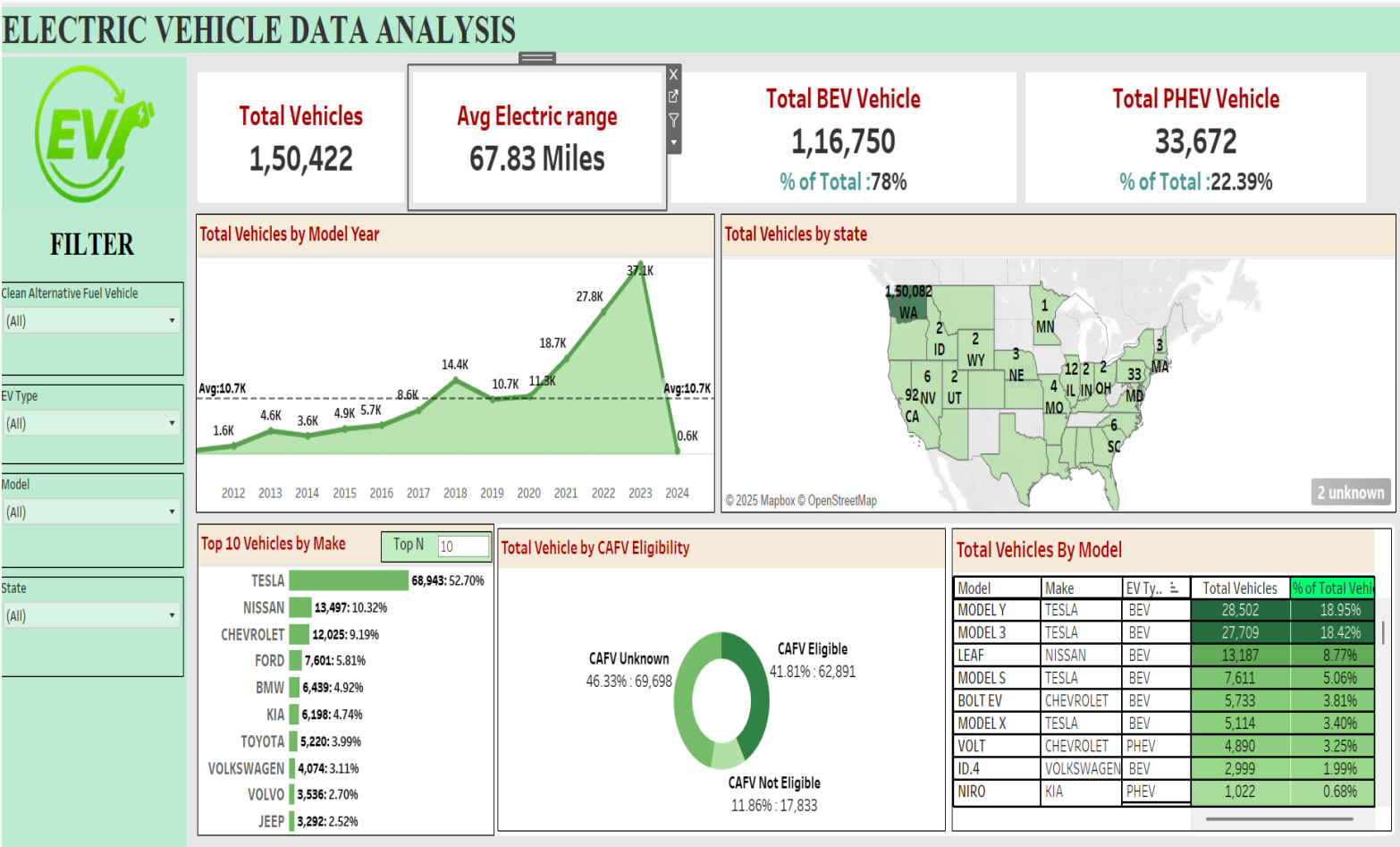
Scope:

- Tracks the growth of EVs from 2012 to 2024
- Includes both BEV and PHEV types
- Focused on U.S. (major concentration in Washington state)

Limitations:

- Data limited to registration records — no usage/charging behavior
- 2024 data may be incomplete (drop observed)
- Missing CAFV eligibility for nearly **46%** of vehicles

7. Expected Results :



1)Total Number of Electric Vehicles –

Type of Visualization: KPI Card

Insights-

- total count of electric vehicles in the dataset — 1,50,422.
- It gives users an immediate idea of the overall EV adoption scale.
- This large number highlights a growing shift toward clean energy

2)Total Electric Vehicle Type (BEV vs. PHEV) –

Type of Visualization : KPI Card

Insights-

- Battery Electric Vehicles (BEVs): 1,16,750 (78%)
- Plug-in Hybrid Electric Vehicles (PHEVs): 33,672 (22.39%)
- BEVs dominate the market, showing a strong consumer preference for fully electric models over hybrids, possibly due to better range and eco-friendliness.

3) Total Vehicles CAFV Eligibility –

Type of Visualization: Donut Chart

This chart displays Eligibility (**CAFV**) :

- **Eligible:** 41.81%
- **Not Eligible:** 11.86%
- **Unknown:** 46.33%

Insights –

While many vehicles qualify for clean energy incentives, a large percentage (46.33%) have missing or unknown eligibility data.

4) Electric Vehicle Count by Model Year –

Type of Visualization: Area Chart (Line + Fill Underneath)

Insights-

- Steady growth from 2012 onward
- Sharp increase between 2018 and 2023
- Peak in 2023 with 37,151 vehicles
- A drop in 2024 (likely due to incomplete data for the current year)

5) Top 10 Electric Vehicle by Make –

Type of Visualization: Horizontal Bar Chart

Insights-

Tesla (68%) is the market leader by a significant margin, followed by Nissan and Chevrolet. This gives an overview of competitive positioning in the EV industry

6) Total Vehicles by State –

Type of Visualization: Filled Map

Insights-

Washington (WA) has the highest count: **1,50,082 EVs**, making it the major EV hub.

This map quickly highlights **regional EV adoption** and helps identify **high-growth vs low-adoption states** for targeted policies or infrastructure planning

8. Future Enhancements

- Add **forecasting models** using historical growth data
- Combine with **charging station locations** for infrastructure planning
- Automate data refresh using live feeds (e.g., from government portals)
- Collect **user feedback or satisfaction data** for richer insight