ELECTRIC VEHICLES ADOPTION

This presentation will explore the trends in electric vehicle adoption through a detailed analysis of Washington State EV's Market

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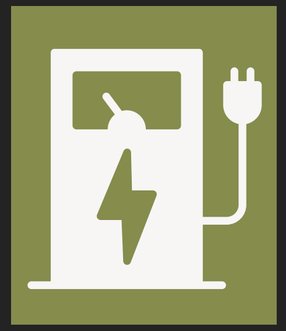
EV MARKET GROWTH & GLOBAL ADOPTION

The global EV market is expanding rapidly, driven by government policies, technological advancements, and consumer demand for cleaner transportation options.

Major automakers are investing heavily in EV production, and sales continue to grow worldwide.

PROJECT OVERVIEW



Objective:

Analyze EV adoption trends using a subset data of 15,000 records.

Key Question 1	Key Question 2	Key Question 3
What are the dominant EV types and manufacturers?	How does CAFV eligibility impact adoption?	What are the geographic and temporal trends?

https://data.wa.gov/Transportation/Electric-Vehicle-Population-Data/f6w7-q2d2/about_data

DATA OVERVIEW

Dataset Size:

15000 Rows, and 17 Columns.

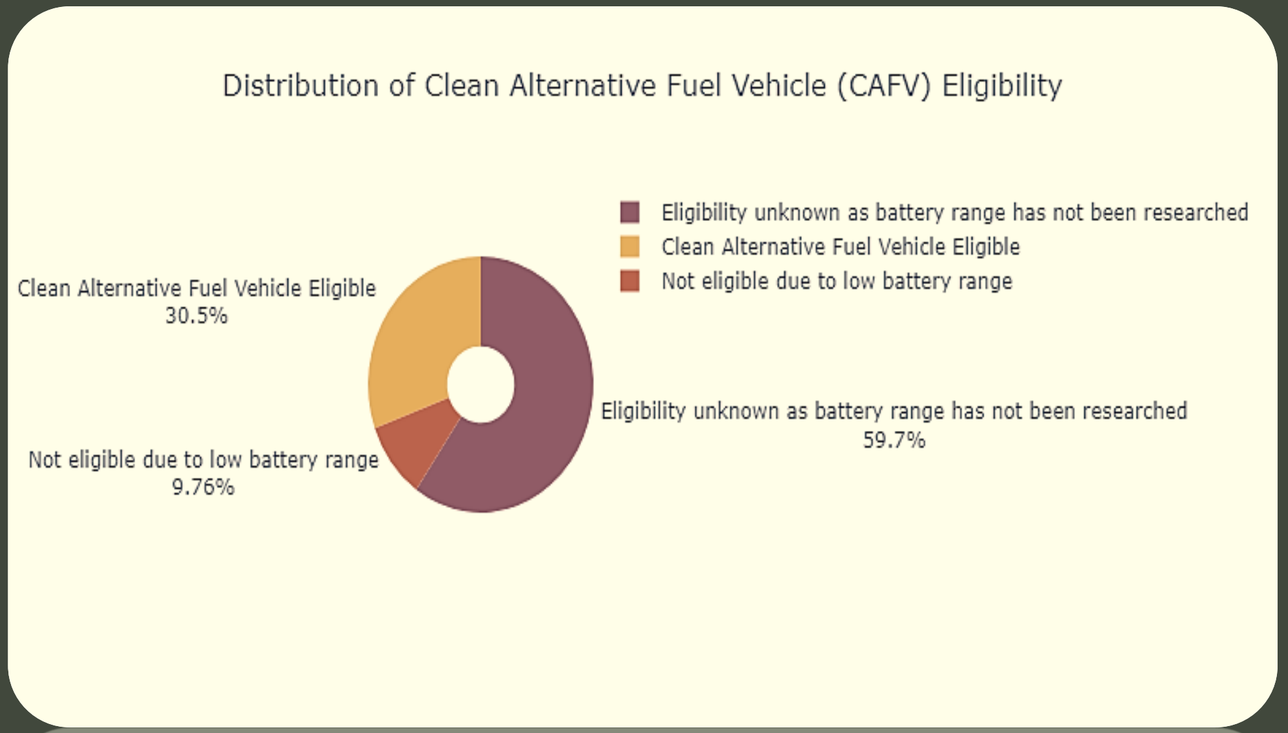
- **Key Variables**:
  - **Numerical**: Model Year, Electric Range, Base MSRP.
  - **Categorical**: Make, Model, EV Type, CAFV Eligibility, State, County.

- **Initial Insights:**
  - **Missing values:**

Electric Range	Base MSRP	Legislative District	Vehicle Location
2	2	32	1

  - **Duplicates:** None detected after cleaning.
  - **Majority have 0$ MSRP** (likely due to leases, incentives, or data gaps).

- **CAFV Eligibility**:
  - Majority (**59.7%**) have *unknown eligibility* due to unverified battery range.

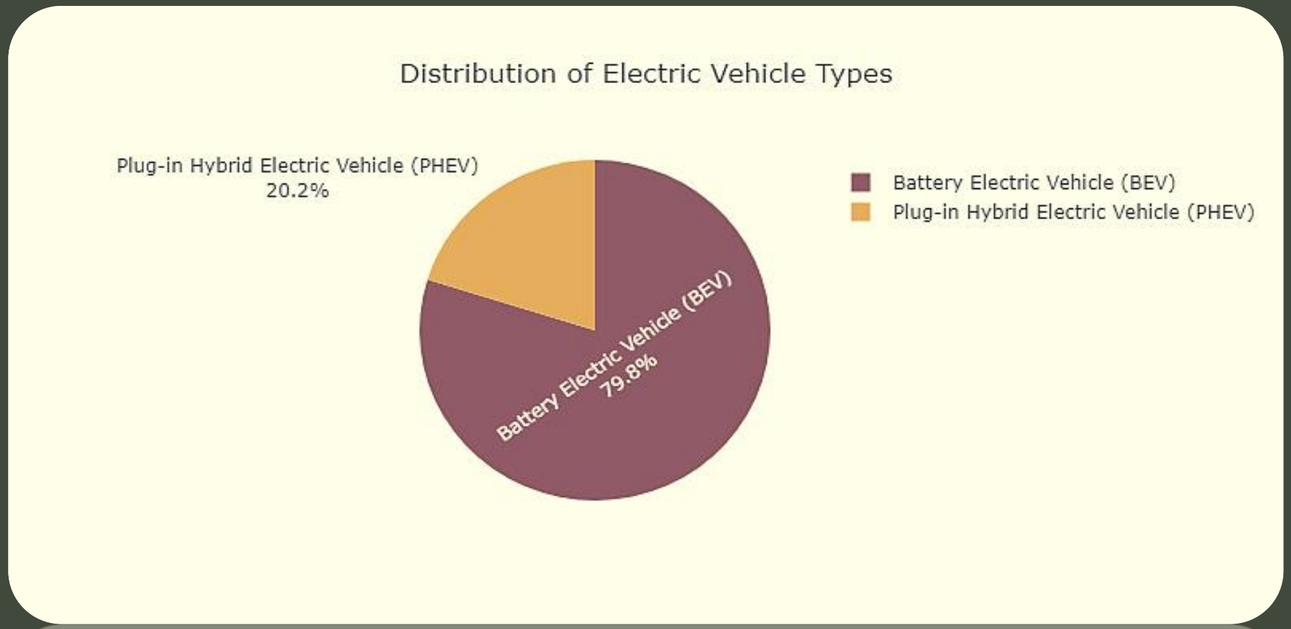


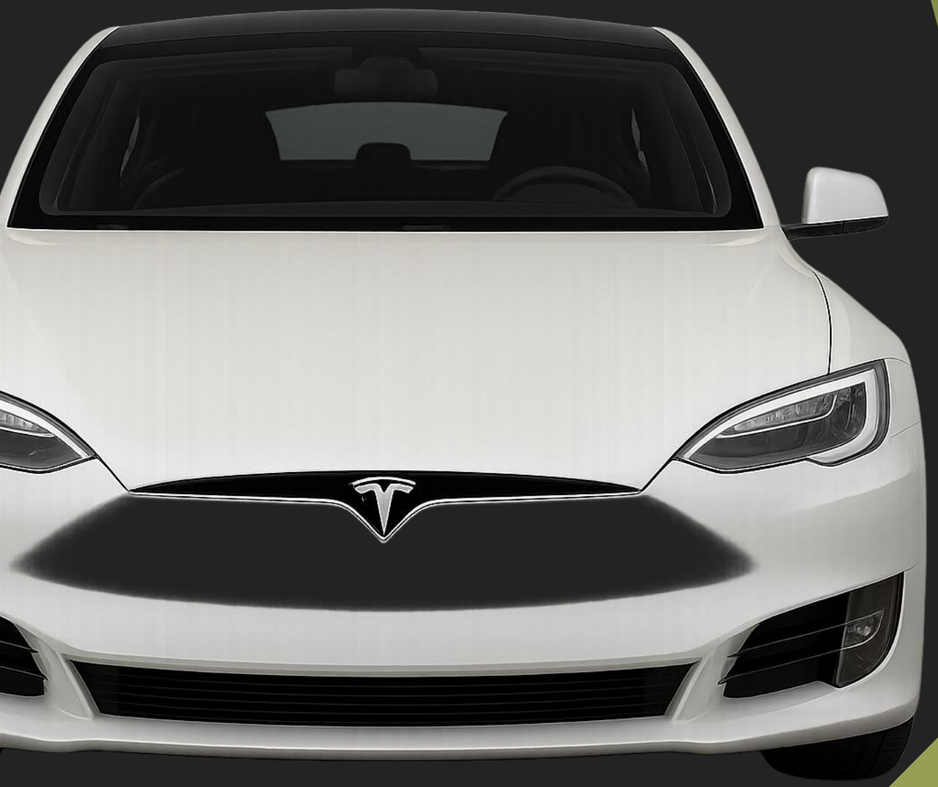
DATA CLEANING STEPS

1. **Handle Missing Values**:
   - Drop rows with missing values.
2. **Remove Irrelevant Columns**:
   - VIN, Postal Code, Legislative District, DOL Vehicle ID (non-essential for analysis).
3. **Outlier Management**:
   - Analyze distributions (e.g., box plots for Electric Range and Base MSRP).
   - Handle Zeros outliers to reflect real-world scenario.

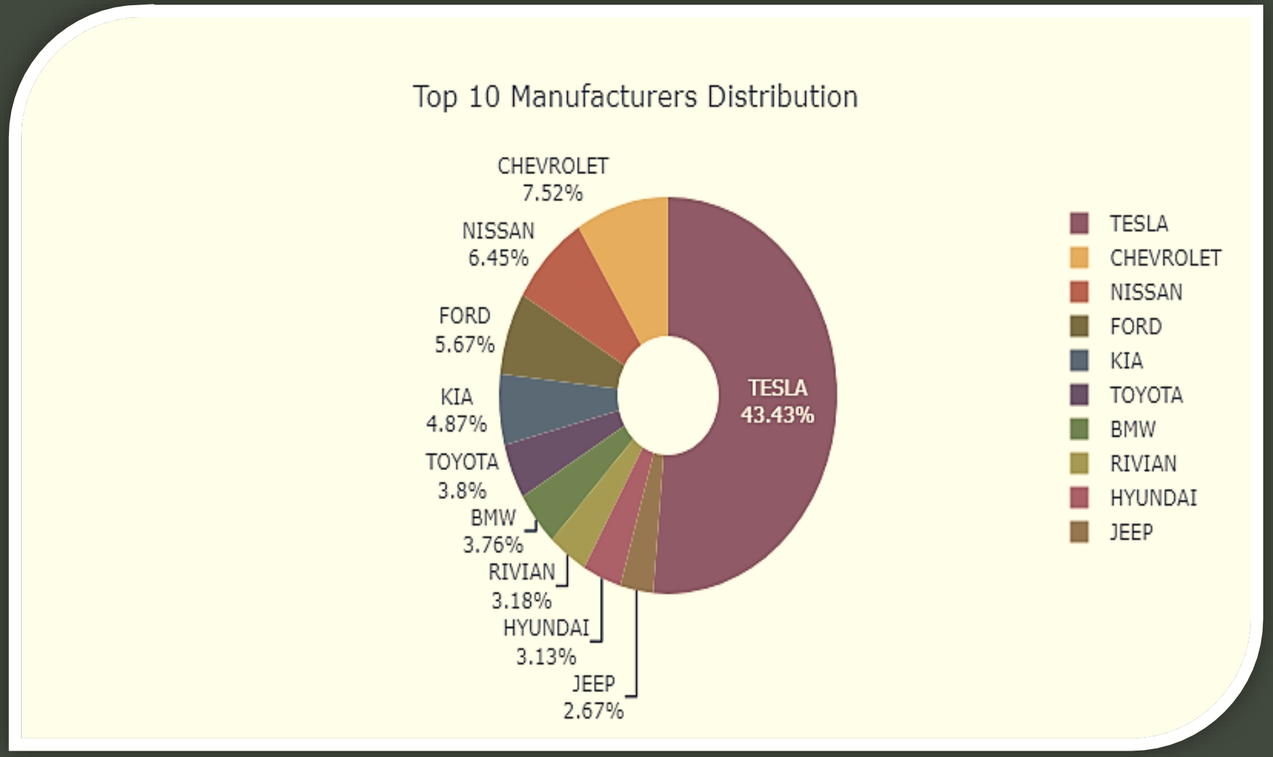
KEY INSIGHTS

- **EV Types**:
  - **Battery Electric Vehicles BEVs** Dominate with **79.8%** Market Share.
  - Plug-in Hybrids (PHEVs) account for **20.2%**.

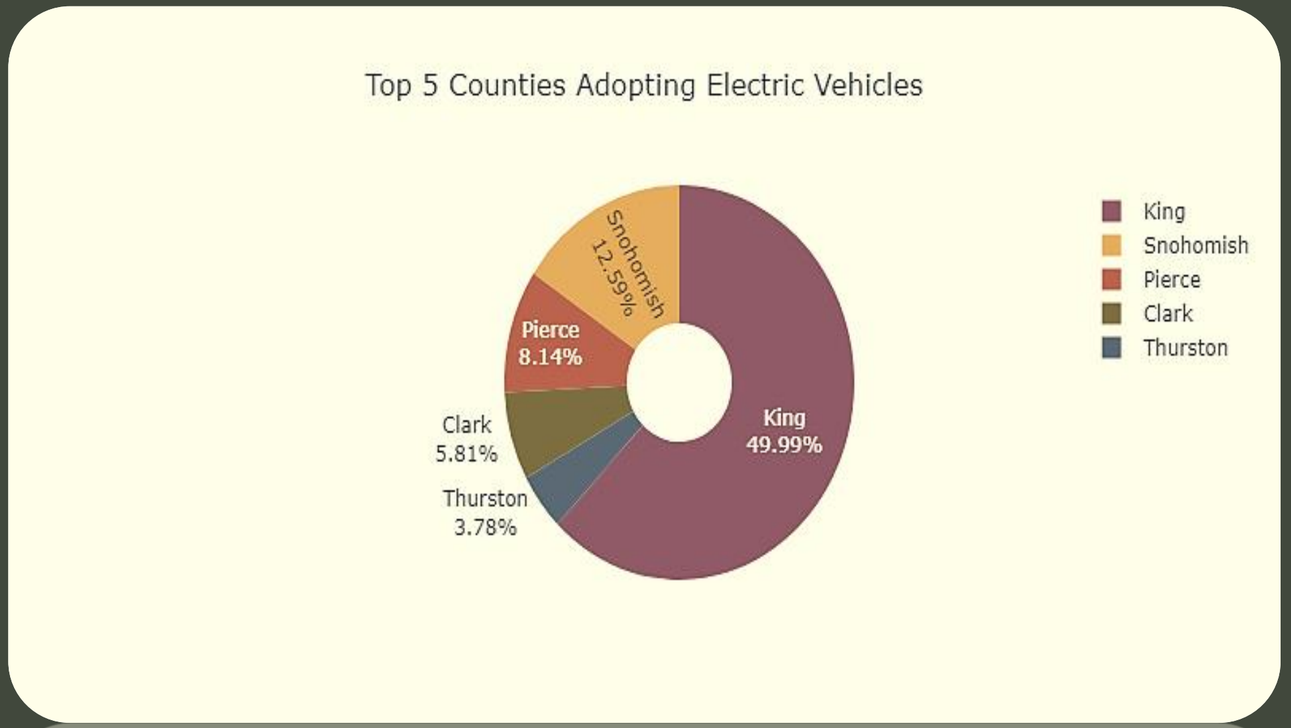




- **Top Manufacturers:**
  - **Tesla** Commands (**43%** of EV Market), followed by Chevrolet, Nissan, and Ford.

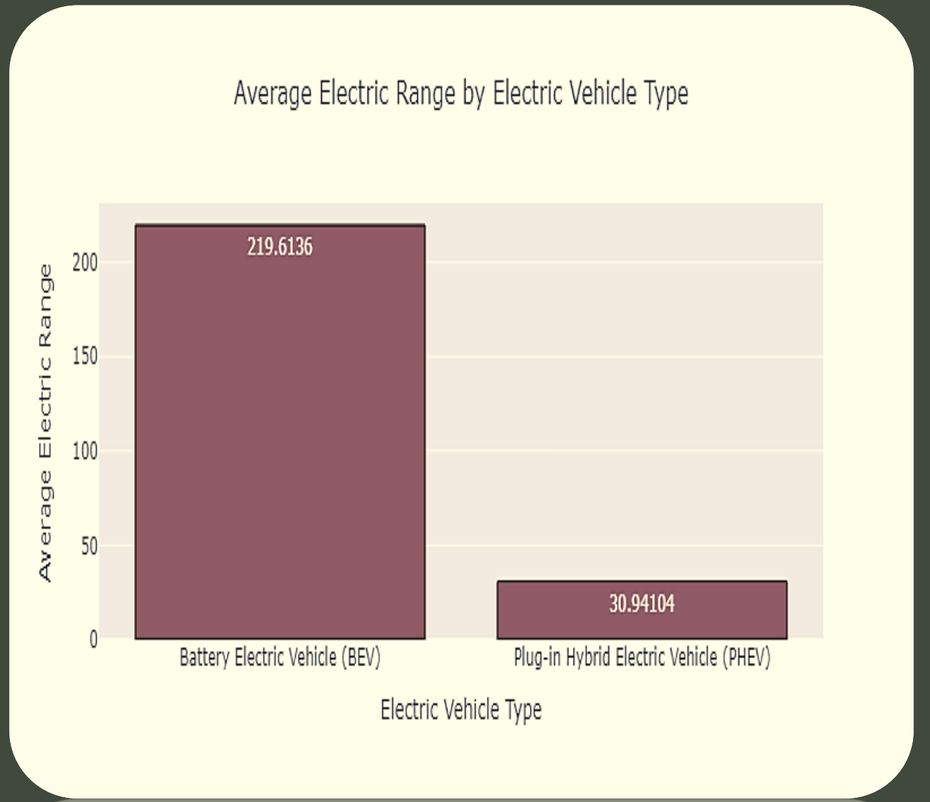


- **Geographic Trends**:
  - **State**: All vehicles registered in **Washington (WA)**.
  - **County**: King County (**49.9%**) leads adoption.



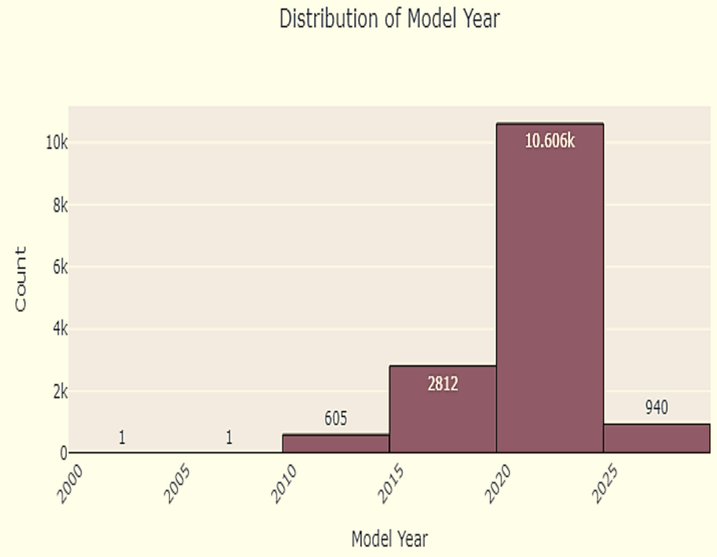
Electric Range

- **BEVs:** Average range **~219** miles.
- **PHEVs:** Average range **~31** miles



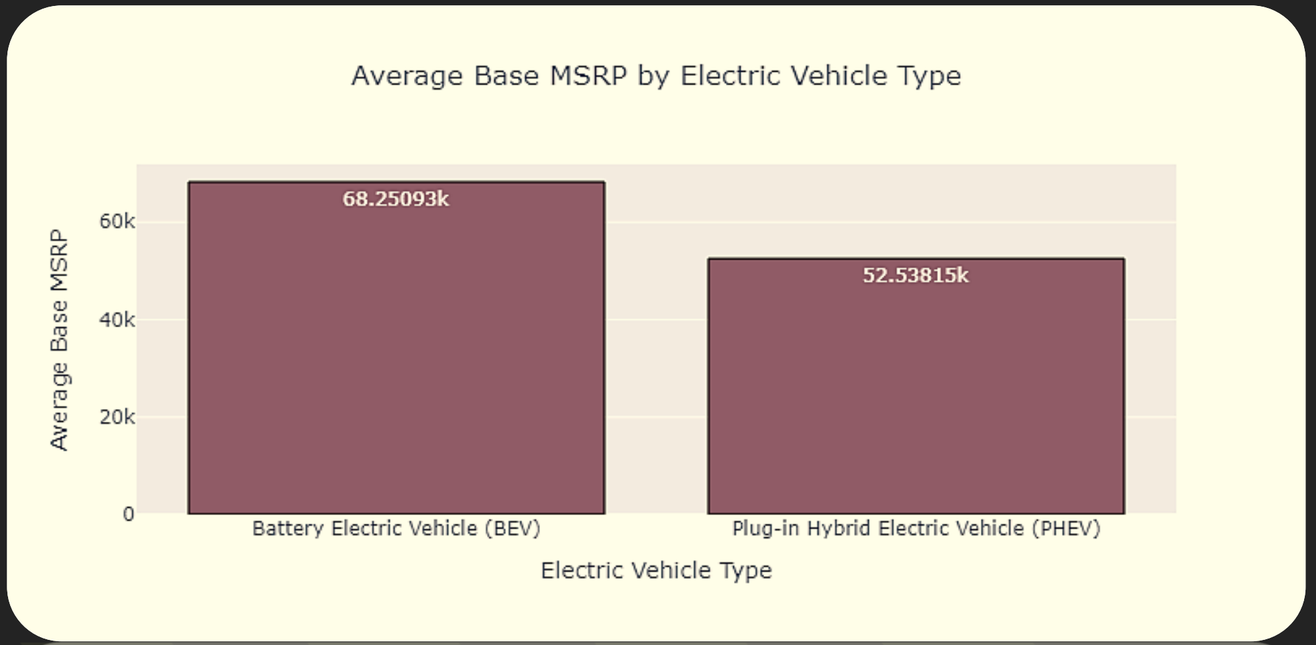
TRENDS OVER MODEL YEAR

- **Adoption Growth:**
  - **Most vehicles** are newer (**2020–2025 models**).
  - **Older models** (**pre-2015**) are rare.



MSRP Insights:

- BEVs: Average MSRP **~68K** $.
- PHEVs: Average MSRP **~53K** $.



RECOMMENDATIONS FOR STAKEHOLDERS

Despite their benefits, EVs face several challenges, including charging infrastructure limitations, battery range concerns, and higher upfront costs. However, continued advancements in technology and government incentives are helping address these barriers.

- **Policy Focus**: Improve data reporting standards for CAFV eligibility.
- **Infrastructure Investment**: Target high-adoption regions (e.g., King).
- **Consumer Awareness:** Highlight benefits of BEVs over PHEVs.
- **Incentives:** Address MSRP gaps to encourage transparency

CONCLUSION

The future of electric vehicles looks promising as technological advancements continue to improve efficiency, affordability, and sustainability.

Summary:

BEVs dominate.

Tesla leads.

Eligibility data needs improvement.

THANK YOU

By adopting EVs and supporting green energy solutions, we can work together to drive toward a cleaner, more sustainable future. Thank you for your time and attention, let’s embrace the future of electric mobility!“

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