

HOW TO: ANALYSE ELECTRIC VEHICLE MARKET TRENDS AND KPI ANALYSIS

BY ASHISH RAGHAV

(DATA ANALYTICS CONSULTANT)



<https://www.linkedin.com/in/ashish-raghav-830b09197/>

PROBLEM STATEMENT

The electric vehicle (EV) market has been experiencing exponential growth in recent years, driven by advancements in technology, shifting consumer preferences, and increasing environmental concerns. As governments, manufacturers, and consumers alike embrace the transition to cleaner, more sustainable transportation, the need for a comprehensive understanding of the evolving EV landscape has never been more crucial. The adoption of electric vehicles is not a one-dimensional change; it involves various interconnected factors such as market demand, technological innovations, infrastructure development, policy support, and environmental impact. Therefore, having an analytical tool that can provide clear, actionable insights into the multifaceted aspects of the EV market is essential for stakeholders to make informed decisions.

The core objective of this project is to develop an interactive, user-friendly EV Dashboard that serves as a powerful analytical tool for visualising and analysing key metrics and trends within the EV ecosystem. By providing an accessible platform for tracking performance indicators, this dashboard will enable users to dive deep into the different dimensions of the market, ranging from vehicle performance and growth rates to adoption patterns and geographical distribution. Whether it's understanding the market size, evaluating the technological advancements in battery range, or assessing the impact of governmental policies, the dashboard will provide stakeholders—such as EV manufacturers, policymakers, fleet operators, and consumers—with the information needed to make data-driven decisions.

1.

KPIS REQUIREMENTS

1. TOTAL VEHICLES:

The first KPI focuses on understanding the overall size of the EV market by examining the total number of electric vehicles in the dataset. This includes both Battery Electric Vehicles (BEVs) and Plug-in Hybrid Electric Vehicles (PHEVs). By analysing this metric, stakeholders can gain insights into the market's growth trajectory and the increasing adoption of sustainable transportation solutions. This metric forms the foundation for exploring detailed trends in EV types and their performance.

2. AVERAGE ELECTRIC RANGE:

Calculating the average electric range of vehicles in the dataset provides a measure of technological advancements within the EV market. The electric range is a critical factor influencing consumer decisions, as it reflects the efficiency and battery performance of EVs. Analyzing this metric can help gauge the industry's progress toward addressing range anxiety and improving overall vehicle capabilities.

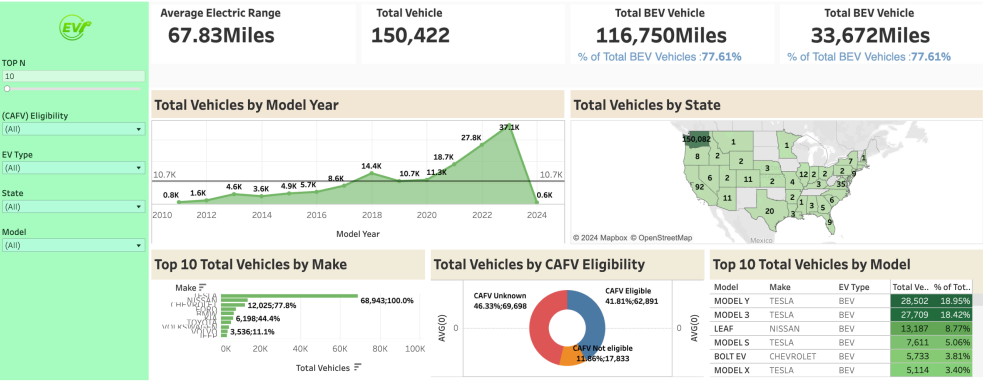
3. TOTAL BEV VEHICLES AND PERCENTAGE:

This KPI involves identifying the total number of Battery Electric Vehicles (BEVs) in the dataset and calculating their percentage share of the overall EV market. BEVs, being fully electric vehicles, are a key indicator of the industry's shift toward zero-emission transportation. This analysis provides insights into the dominance of BEVs in the market and helps understand consumer and industry preferences for fully electric models over hybrids.

4. TOTAL PHEV VEHICLES AND PERCENTAGE:

Similarly, this KPI examines the total number of Plug-in Hybrid Electric Vehicles (PHEVs) and their percentage of the total EV market. PHEVs offer a combination of electric and internal combustion engine propulsion, making them a transitional solution for many consumers. This analysis highlights the role of PHEVs in the market and their contribution to the overall adoption of electric vehicles.

ELECTRIC VEHICLE DASHBOARD



2.

CHARTS REQUIREMENTS

1. TOTAL VEHICLES BY MODEL YEAR (2010 ONWARDS):

- Visualisation: Line or Area Chart
- Description: This chart displays the distribution of EVs by model year, starting from 2010. It helps identify growth patterns and trends in EV adoption over time. By visualising this data, users can pinpoint significant milestones in the industry, such as policy changes or technological advancements that contributed to spikes in EV production or adoption.

2. TOTAL VEHICLES BY STATE:

- Visualisation: Map Chart
- Description: This map-based visualisation provides insights into the geographic distribution of electric vehicles across different states. By highlighting regions with higher EV adoption rates, the chart helps stakeholders identify leading markets and assess the effectiveness of state-level policies and incentives.

3. TOP 10 TOTAL VEHICLES BY MAKE:

- Visualisation: Bar Chart
- Description: This chart ranks the top 10 EV manufacturers based on the total number of vehicles in the dataset. It provides a clear view of the market leaders and their dominance, offering insights into competitive dynamics within the EV industry. This information is crucial for benchmarking and strategy development.

4. TOTAL VEHICLES BY CAFV ELIGIBILITY:

- Visualisation: Pie or Donut Chart
- Description: This chart shows the proportion of vehicles eligible for Clean Alternative Fuel Vehicle (CAFV) incentives. Analysing CAFV eligibility provides insights into the impact of incentives on vehicle adoption and the overall market. It also helps understand the alignment of various EV models with regulatory frameworks and sustainability goals.

5. TOP 10 TOTAL VEHICLES BY MODEL:

- Visualisation: Tree Map
- Description: Highlighting the top 10 EV models based on the total number of vehicles, this tree map offers insights into consumer preferences and the popularity of specific models. It provides a deeper understanding of which vehicles resonate most with the market, aiding manufacturers in identifying key success factors.

3.

SOFTWARE USED

1. MICROSOFT OFFICE/EXCEL:

Excel is used for initial data cleaning, organisation, and basic analysis. It provides a robust foundation for preparing datasets before they are imported into more advanced tools.

2. TABLEAU:

Tableau is the primary tool for building interactive visualisations and the dashboard. Its user-friendly interface and powerful features enable the creation of insightful charts and graphs, facilitating easy exploration of EV data.

3. JUPYTER NOTEBOOK (PYTHON):

Python, through Jupyter Notebook, is utilised for advanced data cleaning, preprocessing, and analysis.

ABOUT ASHISH RAGHAV

Ashish Raghav is a Data Analytics Consultant with over three years of experience specialising in turning complex datasets into actionable insights. He has expertise in creating interactive dashboards using tools like Power BI, Tableau, and Apache Superset. Ashish has worked on real-time analytics projects such as the AWES Education Dashboard and Disha by Indian Air Force, focusing on performance monitoring and strategic decision-making. With skills in Python, statistical analysis, and machine learning, he leverages data to optimise processes and drive business outcomes.