**Electric Vehicle Population Data 2024**

Key questions that can guide your analysis:

**1. Market Trends & Adoption Patterns**

1. What is the total number of electric vehicles (EVs) registered in Washington State?
2. How has EV adoption changed over the years (model year trends)?
3. Which brands and models are the most popular among EV owners?
4. What is the distribution of battery electric vehicles (BEVs) vs. plug-in hybrid electric vehicles (PHEVs)?

**2. Vehicle Performance & Range Analysis**

1. What is the average electric range of EVs in the dataset?
2. Which models offer the longest and shortest electric ranges?
3. Is there a correlation between model year and electric range improvements?

**3. Infrastructure & Charging Needs**

1. How do different EV makes and models vary in terms of charging requirements?
2. What is the share of EVs with different types of charging capabilities (e.g., Level 1, Level 2, DC Fast Charging)?
3. Are certain vehicle brands more dependent on fast charging infrastructure?

**4. Environmental & Policy Impact**

1. How much CO₂ reduction can be estimated based on the EV population?
2. What percentage of vehicles in Washington State are now electric?
3. Are there patterns in EV adoption that correlate with government incentives or policies?

**5. Regional Distribution & Ownership Insights**

1. Which counties or cities in Washington have the highest number of EVs?
2. Are there regional disparities in EV adoption? If so, what factors might explain them?
3. Do high-income areas tend to have a higher concentration of EVs?

**6. Consumer Preferences & Market Competition**

1. Which manufacturers dominate the EV market in Washington?
2. Are there trends in consumer preferences toward specific brands, battery capacities, or price ranges?
3. How do different brands compare in terms of market share over time?

**7. Policy & Incentives Impact**

1. How has EV adoption changed before and after key policy implementations (e.g., tax incentives, rebates, or emissions regulations)?
2. Are certain brands or models more influenced by government incentives?
3. How do vehicle registration trends correlate with changes in fuel tax credits or zero-emission mandates?

**8. Electric Vehicle Cost & Affordability**

1. What is the price distribution of EVs in the dataset?
2. Are there correlations between price and range, model year, or vehicle type?
3. How have the prices of EVs changed over time, considering inflation?

**9. Charging Infrastructure & Range Anxiety**

1. Are there differences in adoption rates for EVs with short vs. long electric ranges?
2. What percentage of EVs in the dataset are capable of DC fast charging?
3. Do certain regions have more EVs with longer ranges, possibly due to charging availability?

**10. Brand Loyalty & Manufacturer Competition**

1. What percentage of EV owners stick to the same brand when upgrading to a newer model?
2. Which manufacturers have gained or lost market share over the past decade?
3. How does Tesla compare to traditional automakers like Ford, GM, and Nissan in terms of market penetration?

**11. Demographics & Socioeconomic Factors**

1. How does EV ownership vary across different income levels and regions?
2. Are EVs more common in urban, suburban, or rural areas?
3. Do certain communities prefer BEVs over PHEVs, and why?

**12. Carbon Emission Reduction Potential**

1. How much carbon dioxide (CO₂) could be saved if all ICE (internal combustion engine) vehicles were replaced with EVs?
2. What is the total estimated reduction in fuel consumption based on the number of EVs in the dataset?
3. How does the growing EV population impact air quality in urban centres?

**13. Second-Hand Market & Vehicle Lifespan**

1. What is the average age of EVs currently in use?
2. Are older EVs still widely used, or do consumers upgrade frequently?
3. How does battery degradation affect the resale value of used EVs?

**14. Future Projections & Adoption Forecasting**

1. Based on historical data, what will the EV population look like in the next 5-10 years?
2. What factors (e.g., government policy, battery technology improvements, charging infrastructure expansion) will have the greatest influence on future adoption?
3. Can machine learning models predict which vehicle types or brands will dominate the EV market in the near future?

**Additional Data Analysis:**

* Highlight the top 10 most used vehicle brands.
* Provide visualizations to illustrate the prevalence of different EV types and brands within the state.
* Explore development trends by evaluating factors such as EV models, types (Battery Electric Vehicles - BEV, Plug-in Hybrid Electric Vehicles - PHEV), electric vehicle range, and base Manufacturer Suggested Retail Price.
* Explore various aspects of EV adoption and distribution.
* Examine brand distribution,
* Vehicle types,
* Regional adoption patterns,
* and trends over time.