



Electric Vehicle (EV) Car Sales Prediction: A Data Science Approach

[summary](#)

This project analyzes historical electric vehicle (EV) car sales data to forecast future trends using linear regression. A clear upward sales trajectory is identified, supporting predictive modeling. Results offer strategic insights while recommending advanced models for improved accuracy.

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1. Introduction and Objective

The rise of electric vehicles (EVs) marks a significant transformation in the global automotive market. This project aims to analyze historical EV car sales data and develop a predictive model to forecast future EV sales. Such insights can support policymakers, manufacturers, and investors in strategic decision-making.

2. Dataset and Preprocessing

The dataset used originates from the International Energy Agency (IEA), focusing on historical EV sales. The data was filtered to include only entries with:

- . Parameter: "EV sales"**
- . Mode: "Cars"**
- . Unit: "Vehicles"**

The resulting data was grouped by year to calculate the total number of EVs sold each year. This transformation enabled a time series analysis of global EV sales trends.

3. Exploratory Data Analysis (EDA)

A line plot of yearly EV sales revealed a clear upward trend, indicating exponential growth in adoption. This visual analysis helped confirm the viability of a predictive model based on historical data.

4. Modeling Approach

The dataset was split into training and test sets (80:20). A simple Linear Regression model from scikit-learn was used to fit the data:

- Features: Year**
- Target: EV sales (in number of vehicles)**

The model was trained on the training set and evaluated on the test set.

5. Results and Evaluation

The model's performance was assessed using the following metrics:

- Mean Squared Error (MSE): Measures the average of the squares of the errors.**
- R-squared (R^2) Score: Indicates the proportion of the variance in the dependent variable that is predictable from the independent variable.**

Results showed a reasonably good fit for a linear model, capturing the growth trend, though it may

underperform for non-linear trends that may arise in future years.

6. Conclusion and Recommendations

The linear regression model provides a foundational forecast of global EV car sales, capturing the broad upward trend. However, to enhance accuracy and account for future policy changes, technological advances, and market dynamics, more sophisticated models (e.g., polynomial regression, time series models) could be explored.

Further recommendations:

- Include more recent and granular data.**
- Factor in regional trends and government incentives.**
- Explore hybrid models combining multiple machine learning techniques.**

This predictive analysis supports the global push toward sustainable transportation and offers a starting point for data-driven planning in the EV sector.