Provide Insights to an Automotive company on Electric vehicles launch in India

Resume Project Challenge (RPC) #12

Presented by Puranjoy Patra

RPC #12

AGENDA

01 Project Overview

02 Data Processing

03 Dashboard Analysis

04 Insights & Recommendations

05 Thanking note

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01. Project Overview

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Problem Statement

AtliQ Motors is an automotive giant from the USA specializing in electric vehicles (EV). In the last 5 years, their market share rose to 25% in electric and hybrid vehicles segment in North America. As a part of their expansion plans, they wanted to launch their bestselling models in India where their market share is less than 2%.

Bruce Haryali, the chief of AtliQ Motors India wanted to do a detailed market study of existing EV/Hybrid market in India before proceeding further. Bruce gave this task to the data analytics team of AtliQ motors and Peter Pandey is the data analyst working in this team.

Goal & Purpose

- To conduct a comprehensive market study on the existing EV/Hybrid vehicle landscape in India, enabling AtliQ Motors to make informed decisions regarding their market entry and expansion strategies.

- This analysis will provide insights into consumer preferences, competitive positioning, and market growth opportunities to increase AtliQ Motors' market share in India beyond 2%.

02. Data Processing

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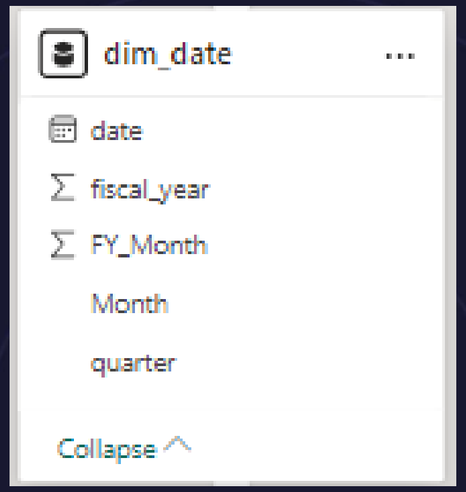
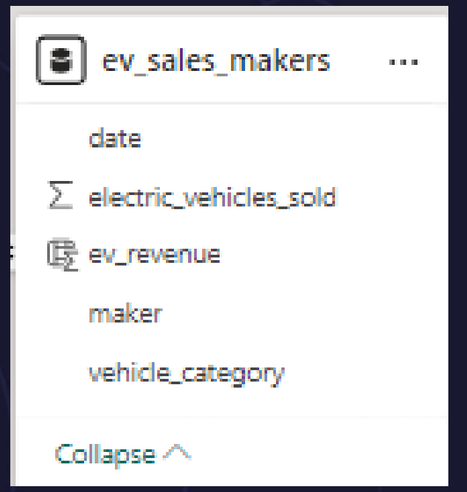
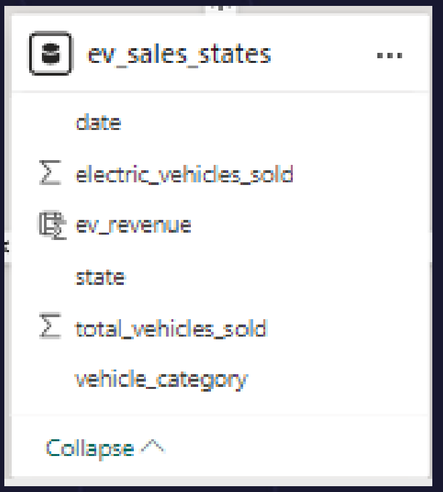
Data Source (DS)

DS1

1. Fact: ev_sales_states and ev_sales_maker & Dimension: dim_date collected from Vahan Sewa.
2. These are provided by Codebasics.

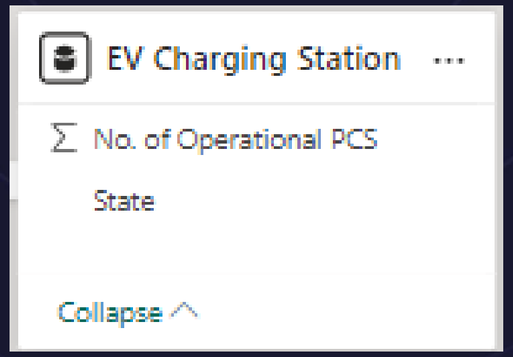


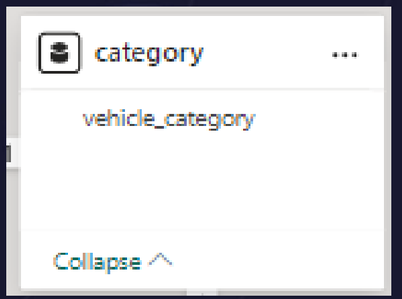




DS2

1. Fact: EV Charging Station extracted data from Press Information Bureau (PIB)
2. Created Category & dim_state from provided fact tabled.





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Data Processing

Extract

Extracting data involves retrieving relevant information from various sources to create a structured dataset for analysis and decision-making

Cleaning

Ensures accuracy and reliability by removing inconsistencies, duplicates, and errors, ultimately improving the quality of insights derived from the analysis

Formatting

Properly formatting data ensures clarity, consistency, and accuracy, enabling more effective analysis and decision-making

Validating

Validating data to enable reliability of information for making actionable insights

Load

Using Power Query, after data transformation and integration for the Power BI reports, load and import data into Power Bi

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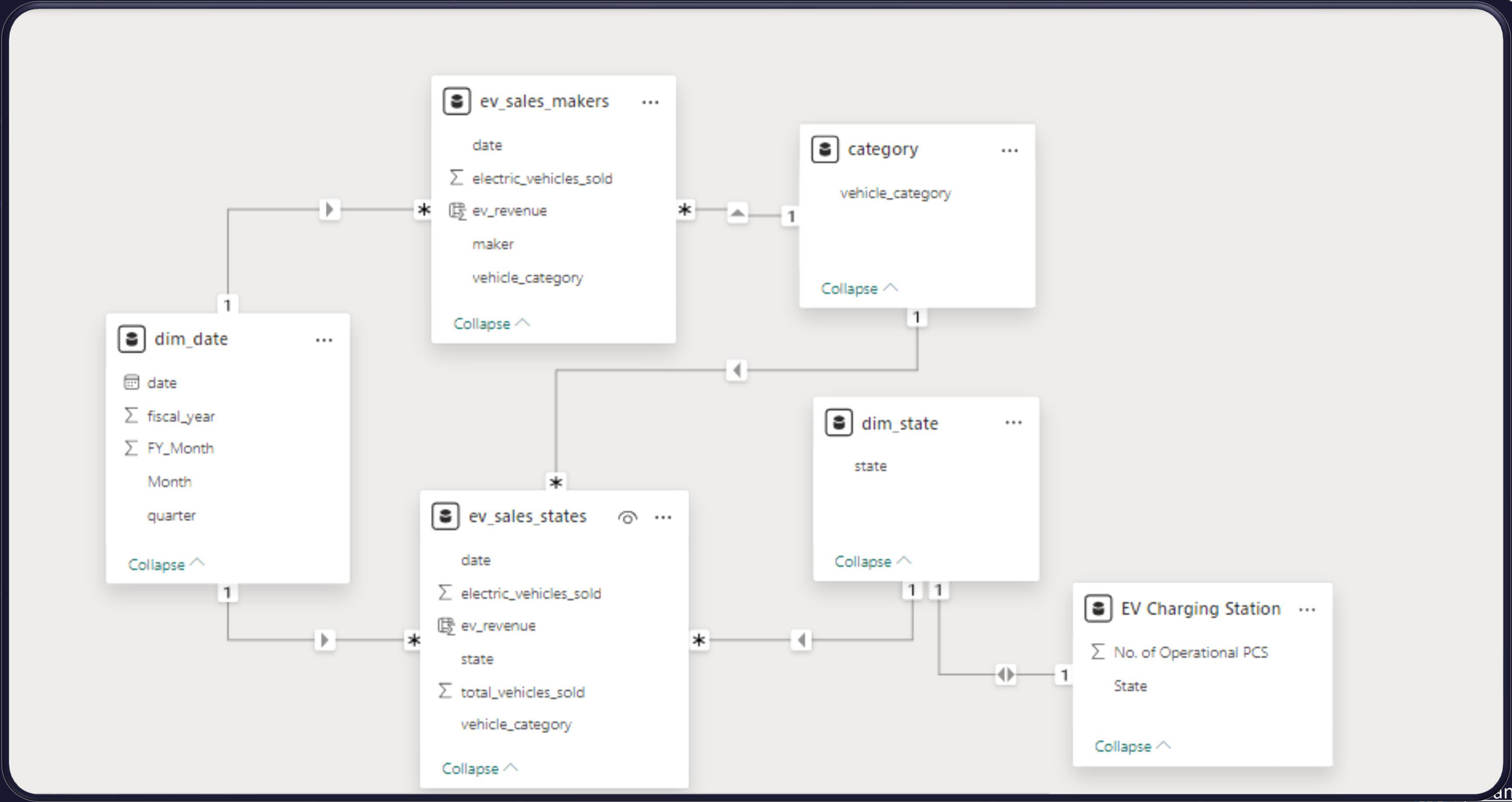
Data Model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electric_vehicles_sold
ev_revenue
maker
vehicle_category
Collapse
category
vehicle_category
Collapse
dim_date
date
fiscal_year
FY_Month
Month
quarter
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dim_state
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electric_vehicles_sold
ev_revenue
state
total_vehicles_sold
vehicle_category
Collapse
EV Charging Station
No. of Operational PCS
State
Collapse
1
*

Key Metrics

Penetration Rate (PR)

$$\text{Penetration Rate} = \left(\frac{\text{Number of EVs}}{\text{Total Number of Vehicles}} \right) \times 100$$

- It shows how widely EVs have been adopted within the overall vehicle market.

Compound Annual Growth Rate (CAGR)

$$\text{CAGR} = \left(\frac{\text{Ending Value}}{\text{Starting Value}} \right)^{\frac{1}{n}} - 1$$

- It is used to measure the consistent growth of EV adoption over time.

Where:

Ending Value = Number of EVs at the end of the period

Starting Value = Number of EVs at the start of the period

n = Number of years

03. Dashboard Analysis

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Dashboard Overview

Makers View

An overview of yearly Electric Vehicle sales performance, segmented by 2-Wheeler and 4-Wheeler categories, helps stakeholders identify trends, compare top-performing brands, and analyze market presence across makers..

States View

Analyzes EV adoption across Indian states, highlighting monthly 2-wheeler and 4-wheeler sales trends relative to total vehicle sales, helping assess regional policy impacts and identify leading states.

Performance & Revenue View

Analyzes EV makers and state-wise sales performance, with revenue growth projections and estimated 2030 EV sales, available Charging Station, aiding industry trend forecasts and strategic planning

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Let’s Explore Dashboard

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04.
Insights & Recommendation

Preliminary Question

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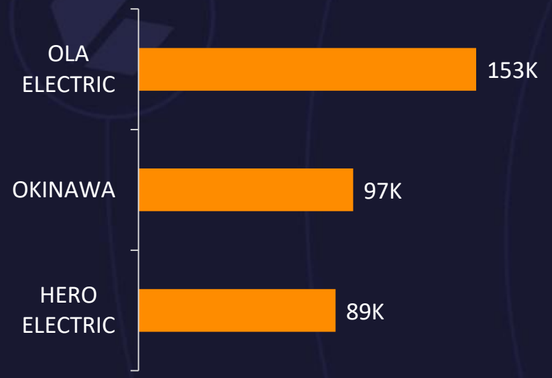
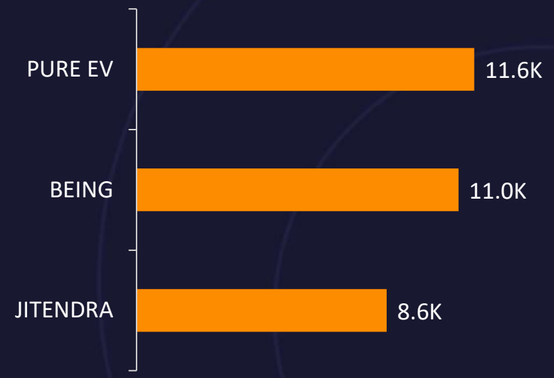
Insights

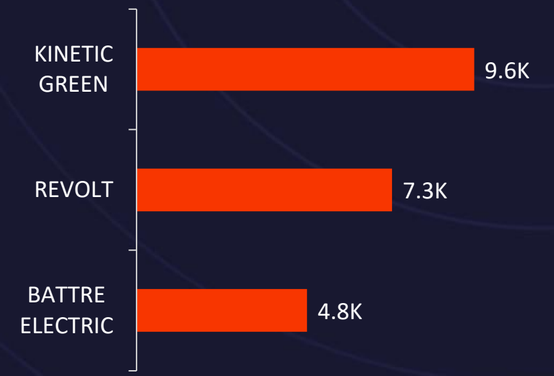
List the top 3 and bottom 3 makers for the fiscal years 2023 and 2024 in terms of the number of 2-wheelers sold.





2023

1. **Top Maker: OLA Electric**
2. **Least Maker: JITENDRA**



2024

1. **Top Maker: OLA Electric**
2. **Least Maker: BATTRE ELECTRIC**

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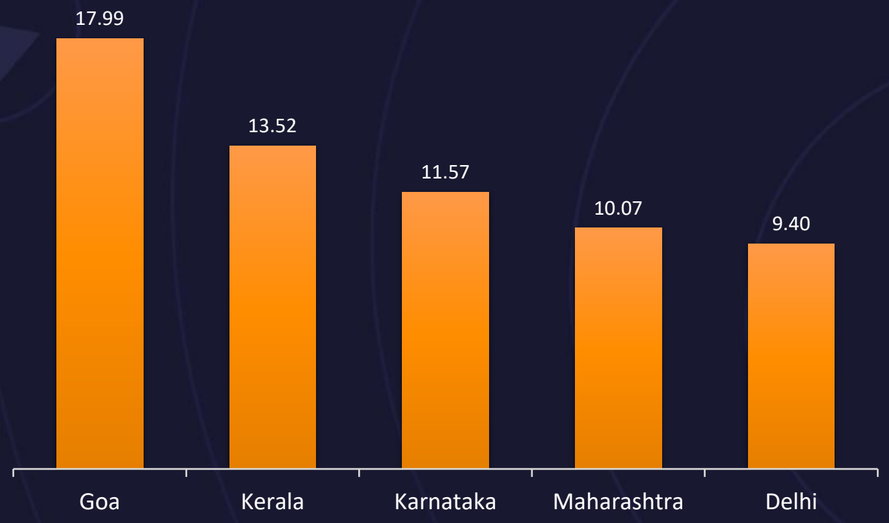
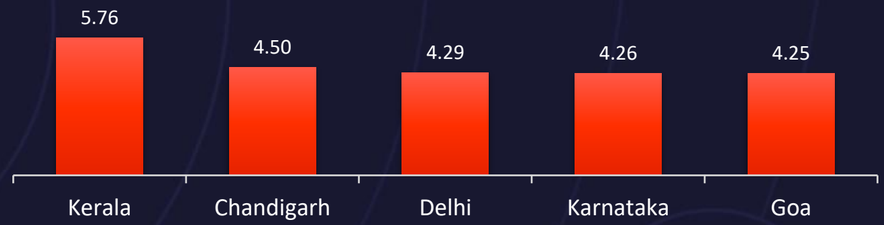
Insights

Identify the top 5 states with the highest penetration rate in 2-wheeler and 4-wheeler EV sales in FY 2024.





2W

GOA has the highest Penetration Rate of ~ 18% in FY 2024

4W

On the other hand, Kerala has highest Penetration Rate (PR) of 5.76% in FY 2024

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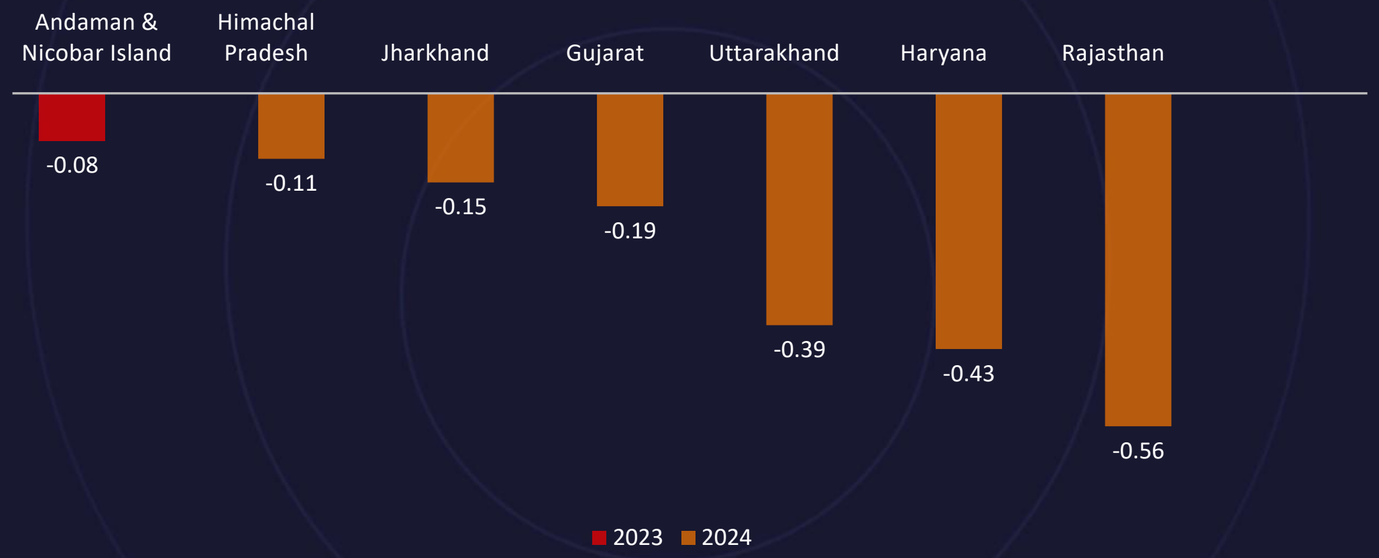
Insights

List the states with negative penetration (decline) in EV sales from 2022 to 2024?



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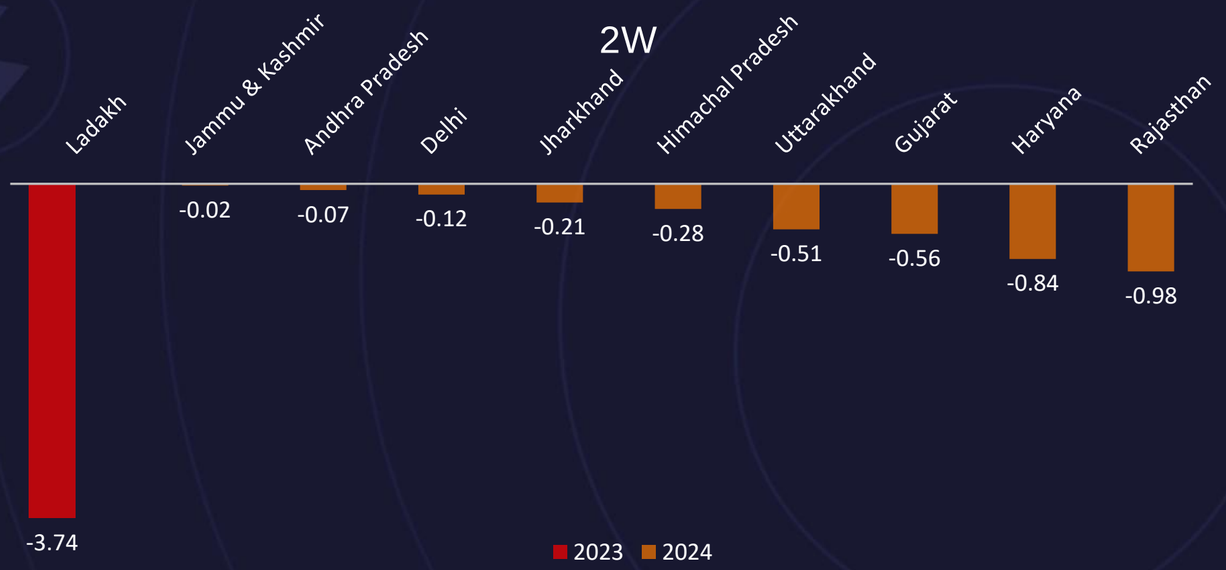
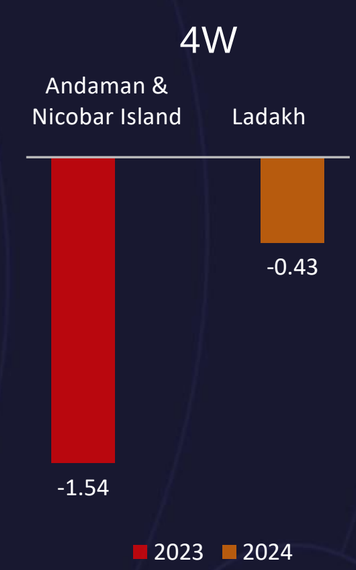
Insights

List the states with negative penetration (decline) in EV sales from 2022 to 2024?





2023

For 2W, in Ladakh Pris declined more and for 4W, in Andaman & Nicobar Island PR is declined more.

2024

For 2W, in Rajasthan PR is declined more and for 4W, in Ladakh PR is declined more.

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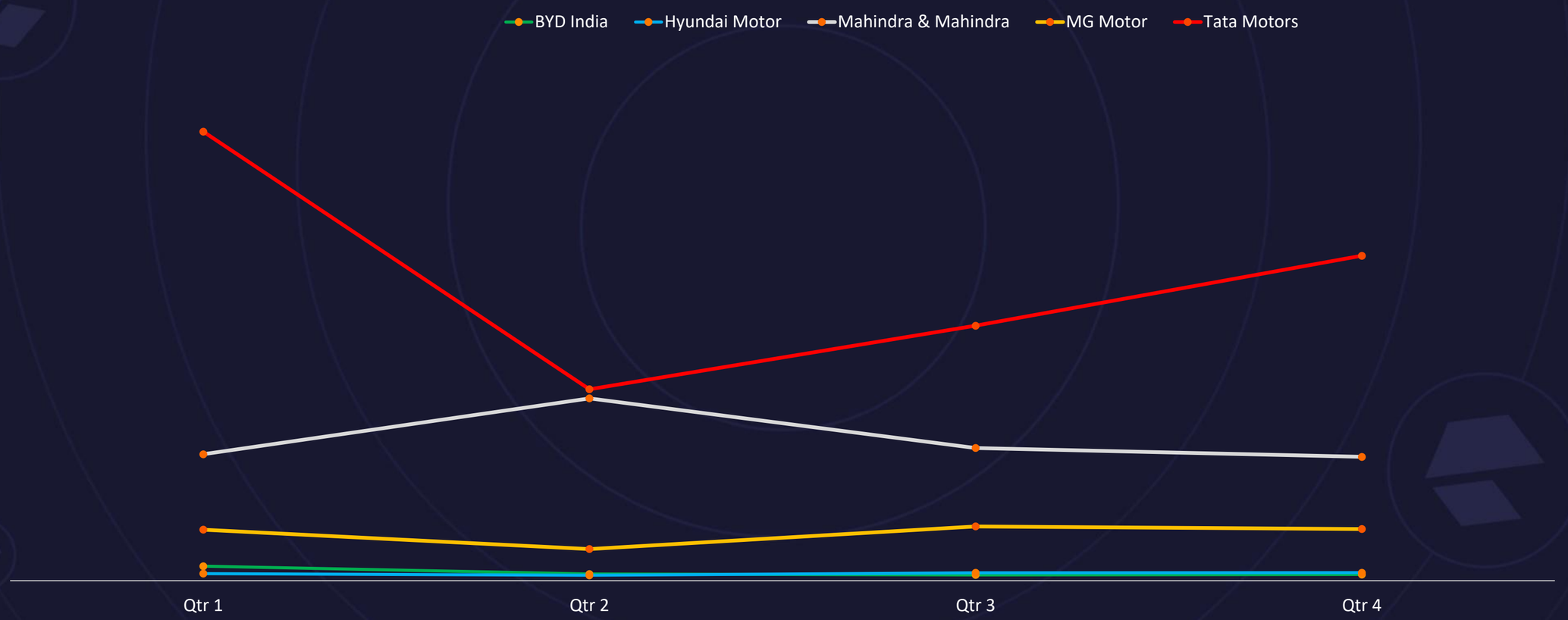
Insights

What are the quarterly trends based on sales volume for the top 5 EV makers (4-wheelers) from 2022 to 2024?



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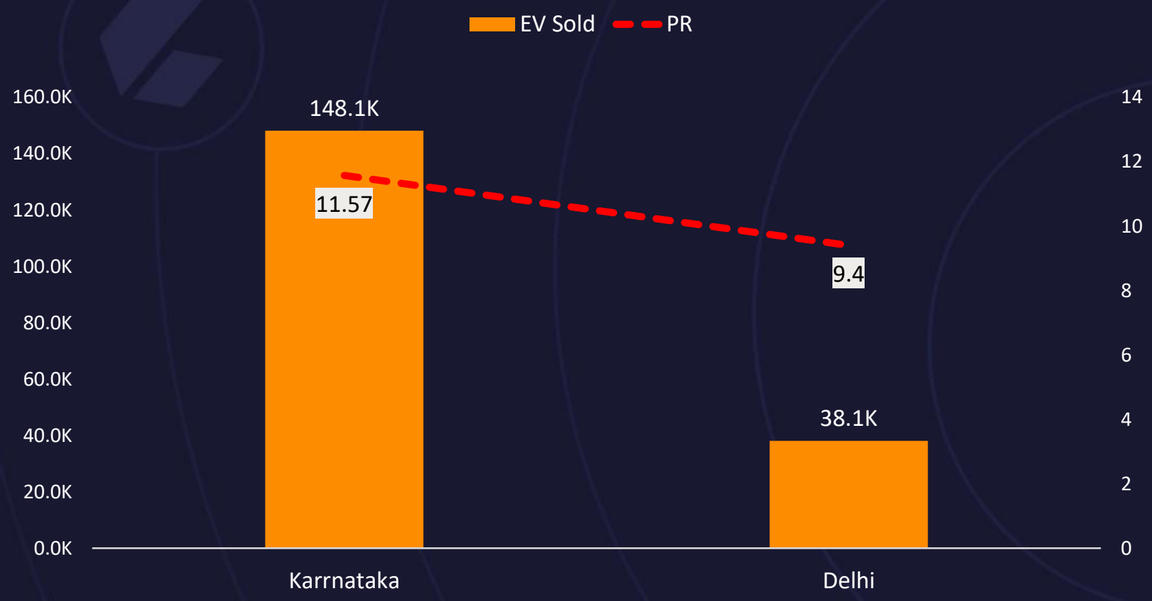
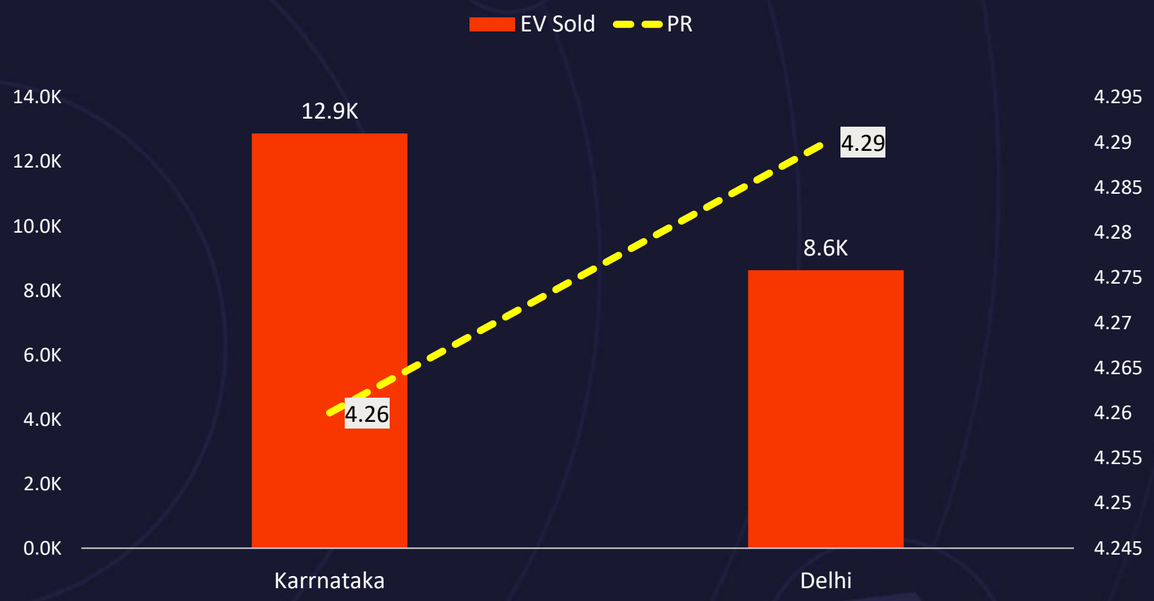
Insights

How do the EV sales and penetration rates in Delhi compare to Karnataka for 2024?





2W

Karnataka has better EV Sales volume and PR % as compared to Delhi for 2W.

4W

For 4W, in Karnataka EV sales is better than Delhi but PR% is higher in Delhi.

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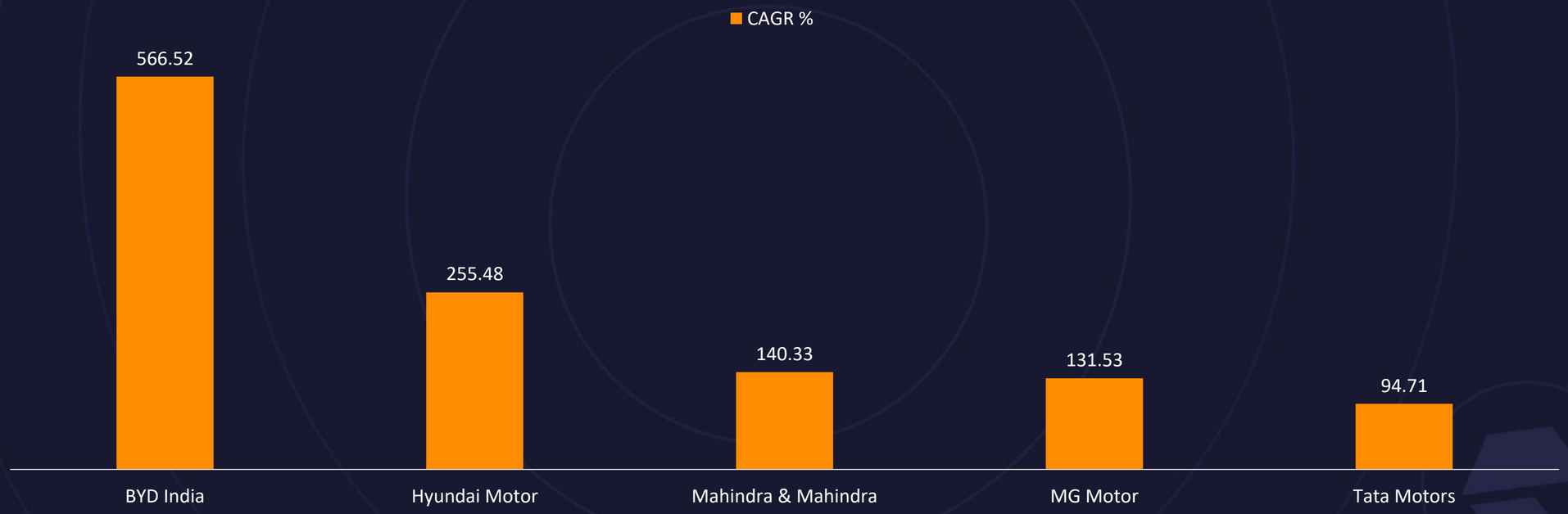
Insights

List down the compounded annual growth rate (CAGR) in 4-wheeler units for the top 5 makers from 2022 to 2024.



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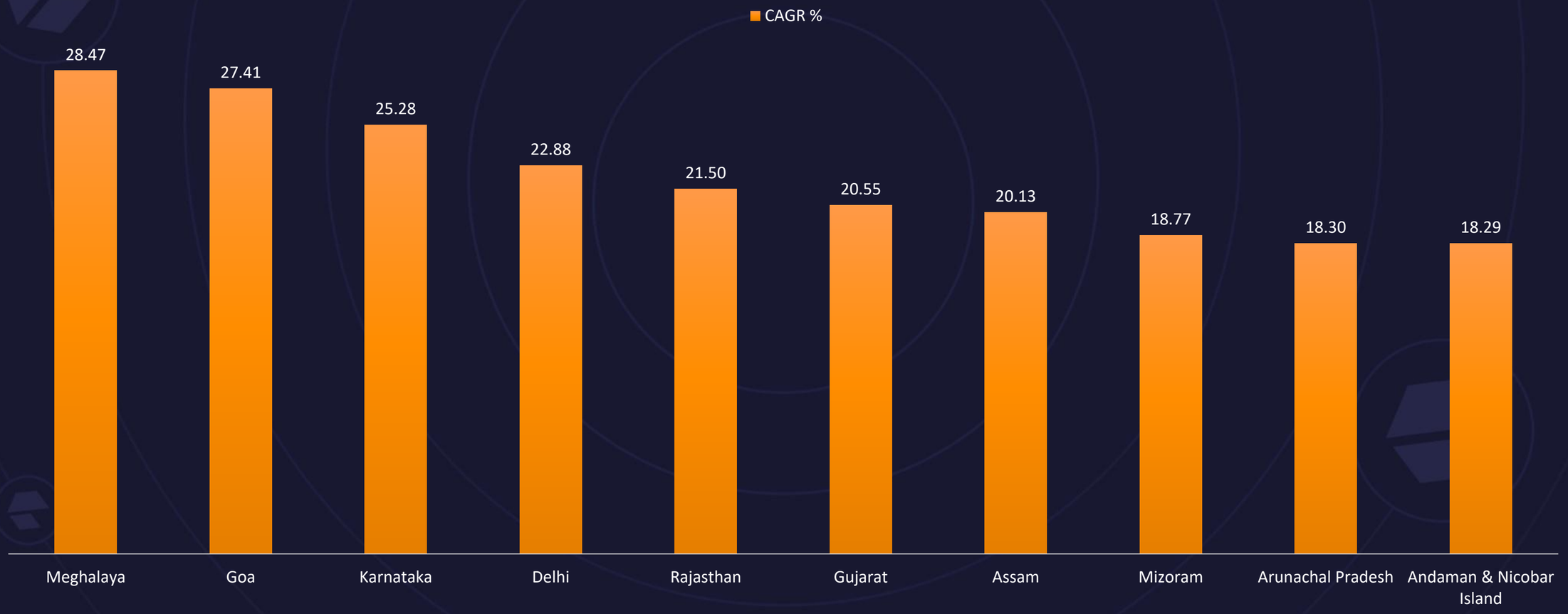
Insights

List down the top 10 states that had the highest compounded annual growth rate (CAGR) from 2022 to 2024 in total vehicles sold.



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Insights

What are the peak and low season months for EV sales based on the data from 2022 to 2024?

Trend

Peak month is March & low month is June.

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Insights

What are the peak and low season months for EV sales based on the data from 2022 to 2024?

2022

For FY 2022, peak month is March & low month is May.

2023

For FY 2023, peak month is March & low month is May.

2024

For FY 2024, peak month is March & low month is June.

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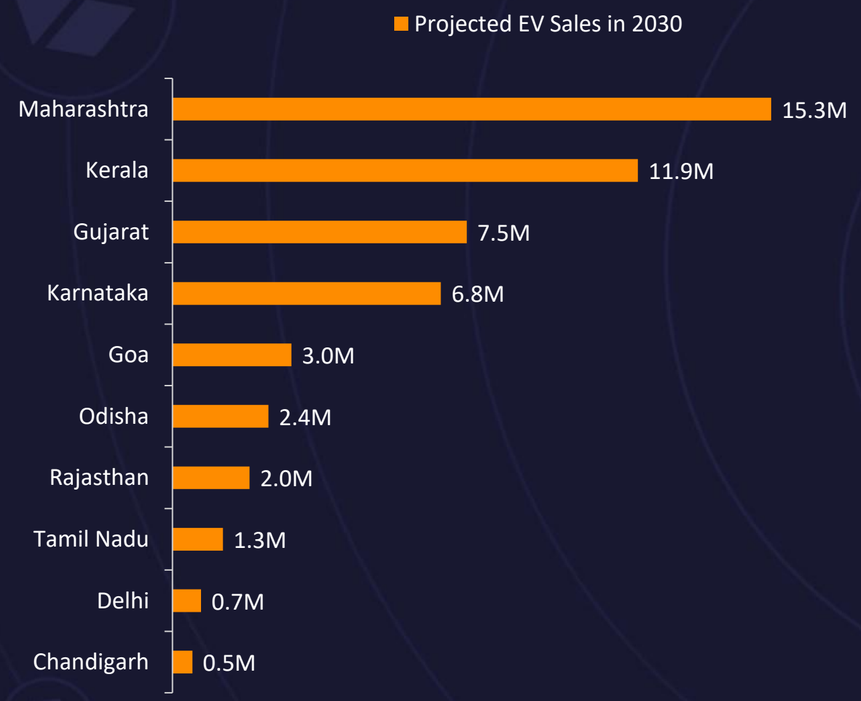
Insights

What is the projected number of EV sales (including 2-wheelers and 4-wheelers) for the top 10 states by penetration rate in 2030, based on the compounded annual growth rate (CAGR) from previous years?



2W

In Maharashtra, expected Projected sales will be higher in 2030.

4W

In Karnataka, expected Projected sales will be higher in 2030.

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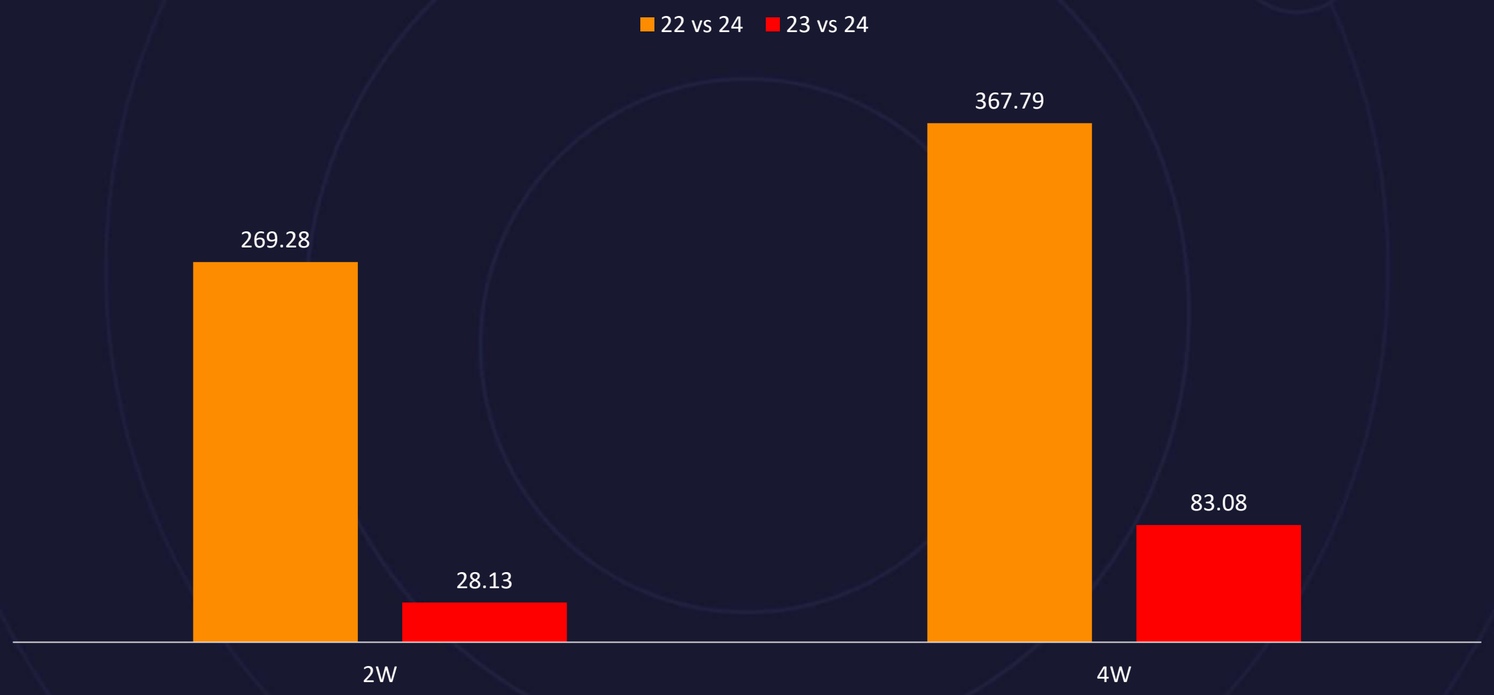
Insights

Estimate the revenue growth rate of 4-wheeler and 2-wheelers EVs in India for 2022 vs 2024 and 2023 vs 2024



Secondary Question

Insights

What are the primary reasons for customers choosing 4-wheeler EVs in 2023 and 2024 ?

- **Environmental Concerns**
  - EVs produce zero exhaust emissions,
  - helping to reduce air pollution and combat climate change
- **Cost Savings**
  - Lower operating and maintenance costs compared to internal combustion engine (ICE) vehicles
  - Significant reduction in fuel costs and offer long-term savings despite higher upfront costs
- **Government Incentives**
  - government's push towards EV adoption through incentives subsidy like FAME II (Faster Adoption and Manufacturing of Hybrid and Electric Vehicles) and Production Linked Incentive (PLI)
  - Tax rebate like exempt on Road tax, Goods and Services Tax (GST) has been reduced from 12% to 5%

Insights

What are the primary reasons for customers choosing 4-wheeler EVs in 2023 and 2024 ?

- Technological Advancements
  - Improvements in battery technology, leading to better range and faster charging times
  - Increased availability of charging infrastructure
- Variety and Availability EV Models
  - Launch of affordable and diverse EV models, particularly in the SUV segment such as Tata Nexon EV, Hyundai Kona, and MG ZS EV etc

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Insights

How do government incentives and subsidies impact the adoption rates of 2-wheelers and 4-wheelers? Which states in India provided most subsidies?

Government incentives and subsidies have significantly influenced the adoption rates of electric vehicles (EVs) in India, with sales of 2-wheelers and 4-wheelers increasing from 0.27 million to 1.02 million between FY2022 and FY2024

2W

State	Subsidy (Per kWh)	Maximum subsidy	Discount on road tax
Maharashtra	Rs. 5,000	Rs. 25,000	100%
Assam	Rs. 10,000	Rs. 20,000	100%
Meghalaya	Rs. 10,000	Rs. 20,000	100%

4W

State	Subsidy (Per kWh)	Maximum subsidy	Discount on road tax
Maharashtra	Rs. 5,000	Rs. 2,50,000	100%
Assam	Rs. 10,000	Rs. 1,50,000	100%
West Bengal	Rs. 10,000	Rs. 1,50,000	100%

Except these states; Gujarat, Bihar, Rajasthan, etc. also provided subsidy.

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Insights

How does the availability of charging stations infrastructure correlate with the EV sales and penetration rates in the top 5 states?

State	EV Sales	PR %	Charging Station
Maharashtra	396045	6.49%	3079
Karnataka	312995	7.84%	1041
Tamil Nadu	200062	4.30%	643
Gujarat	181389	4.40%	476
Rajasthan	150366	4.55%	500

Correlation Efficient between EV Sales & Charging Station is ~0.90 and PR% & Charging Station is ~0.52

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Insights

Who should be the brand ambassador if AtliQ Motors launches their EV/Hybrid vehicles in India and why?

- **MS Dhoni as a brand ambassador would be an excellent choice for AtliQ Motors' EV/Hybrid vehicles in India**

Reason:

- **Wide Appeal and Popularity**
- **Alignment with EV Values**
- **Positive Impact on Consumer Perception**
- **Significant Media Presence**

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Insights

Which state of India is ideal to start the manufacturing unit?

- **Subsidies & Incentives:** Offers generous incentives for EV manufacturing under its EV policy, including capital subsidies, power tariff incentives, and land allotment assistance.
- **Ease of Doing Business:** Ranked among the top states for ease of doing business with robust infrastructure and strong industrial presence.
- **Stability:** Known for its political and economic stability, Maharashtra offers a conducive environment for large-scale industrial projects.

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Recommendation

My top 3 recommendations for AtliQ Motors

Simple and powerful

- **First to launch Evs in 2W segment to get entry in Indian EV Market. As out of total EV (2W & 4W), 2W category has captured ~91% market share.**
- **Invest on R&D for innovative design and features, Charging station infrastructure for increasing availability because along with 2W, 4W category has good potential and high chance for revenue growth.**
- **For manufacturing and production, focus on targeted states.**

Flexible and useful

Thank You!

Feel free to share your feedback in comment section.