Resume Challenge # 12

Business Insights on India's Electric Vehicle Market

Insights For AtliQ Motor's!

Presented by : Ganesh Chandra Panda

Agenda:

- Problem Statement
- Dataset
- Data Cleaning & Transformation
- Dashboard
- Insights
- Suggestions

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 the 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 India's existing EV/Hybrid market before proceeding further.

Dataset:

We have 5 csv files collected from Parivhan sewa & data.gov in official websites

- Dim_date:
  date, fiscal_year, quarter

- Electric_vehicle_sales_by_makers:
  date, vehicle_category, maker, electric_vehicles_sold

- Electric_vehicle_sales_by_state
  date, state, vehicle_category, electric_vehicles_sold, total_vehicles_sold

- EV_Chargingstation_Statewise
  Sl. No. , State/ UT, No. of PCS as on 31st March 2024

सत्यमेव जयते
data.gov.in
Open Government Data (OGD) Platform India

PARIVAHAN SEWA

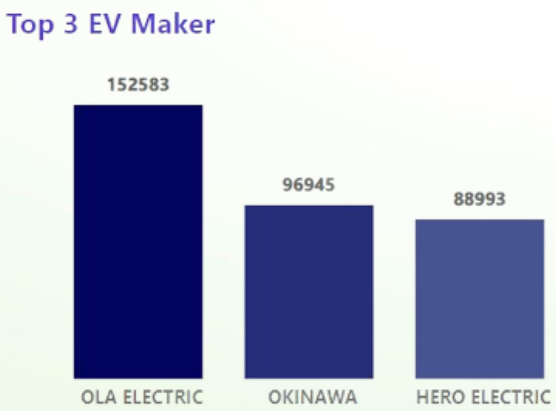
Data Cleaning & Transformation:

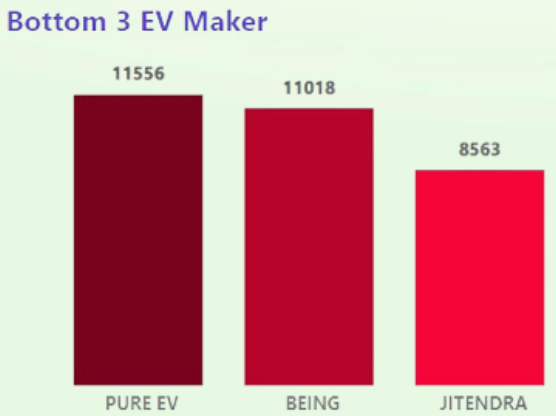
1. Cleaning of Invalid Data
2. Creating New Columns
3. Correction of spelling for state and maker Names

Primary Insights

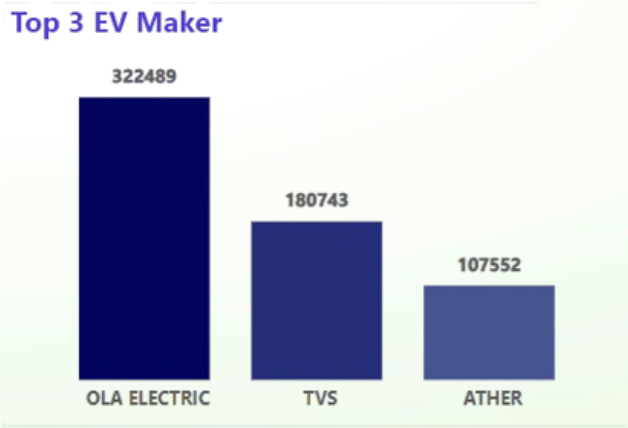
- **List the top 3 and bottom 3 makers for the fiscal years 2023 and 2024 in terms of the number of 2-wheelers sold.**

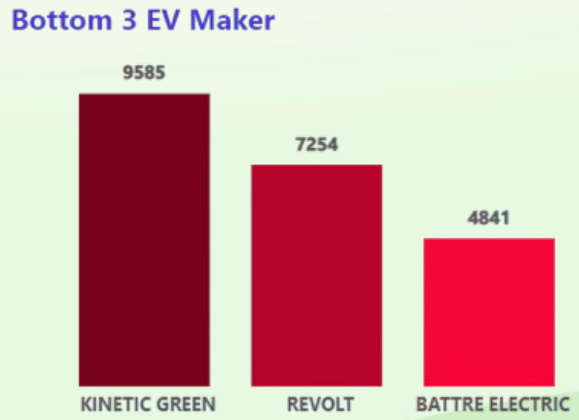
2023





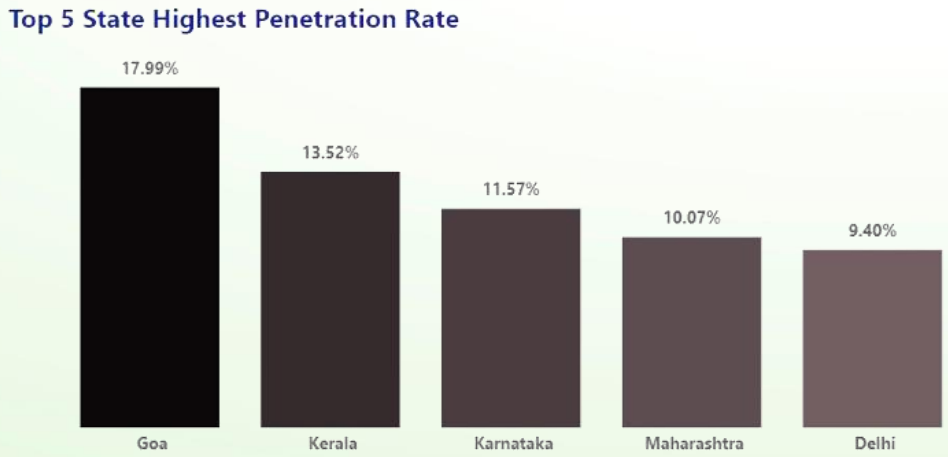
2024



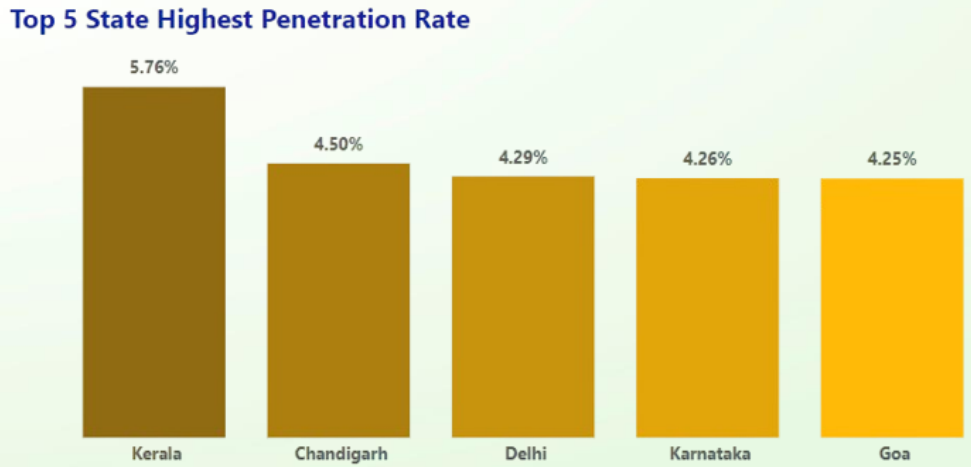


➢ **Identify the top 5 states with the highest penetration rate in 2-wheeler and 4-wheeler EV sales in FY 2024.**

2-wheeler

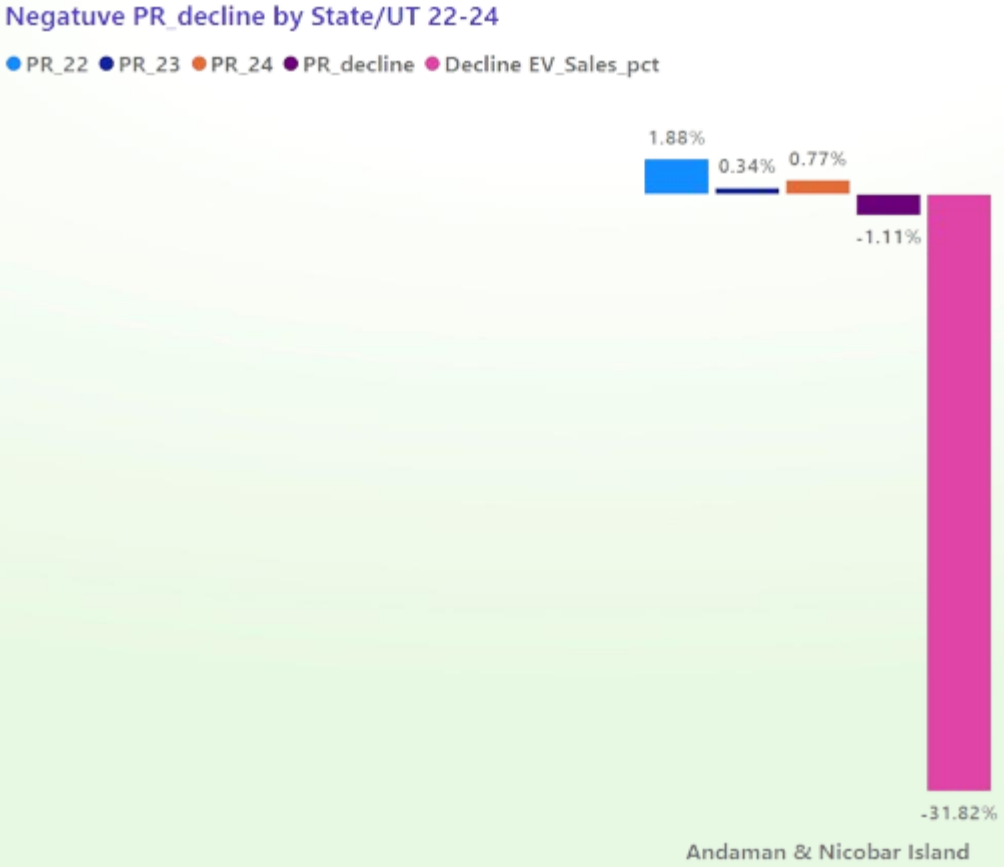


4-wheeler



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

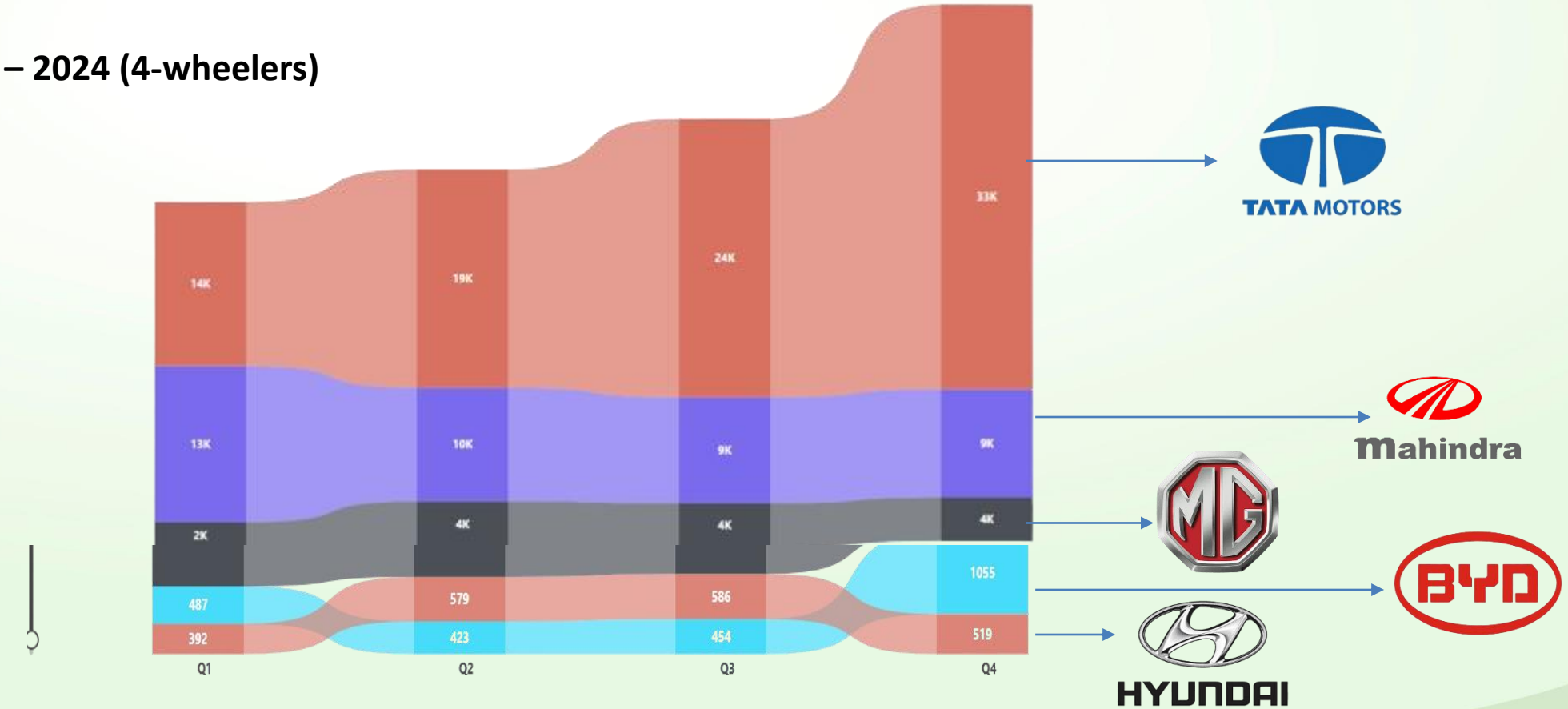
4-wheeler



For Andaman and Nicobar Island the Electric Vehicles Penetration rate in the 4-wheeler category dropped by 1.11 %.

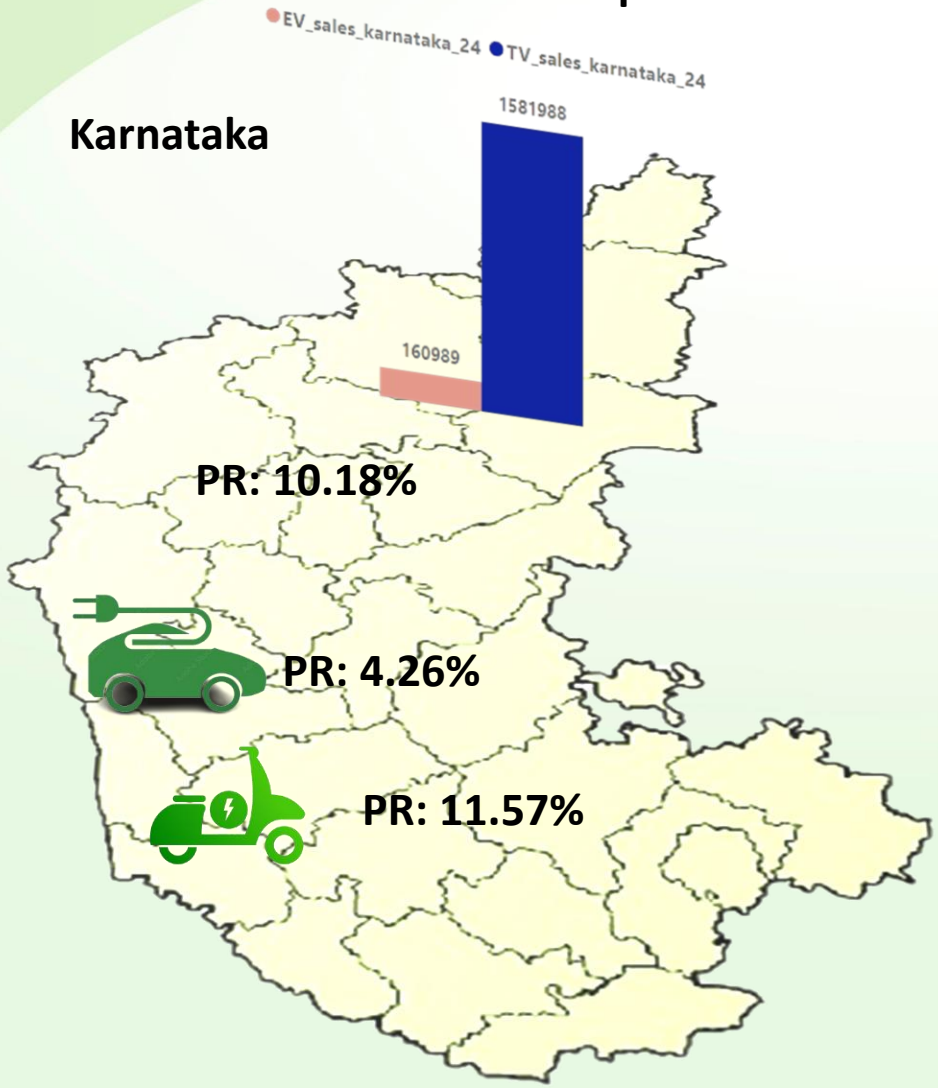
- **What are the quarterly trends based on sales volume for the top 5 EV makers (4-wheelers) from 2022 to 2024?**

FY: 2022 – 2024 (4-wheelers)

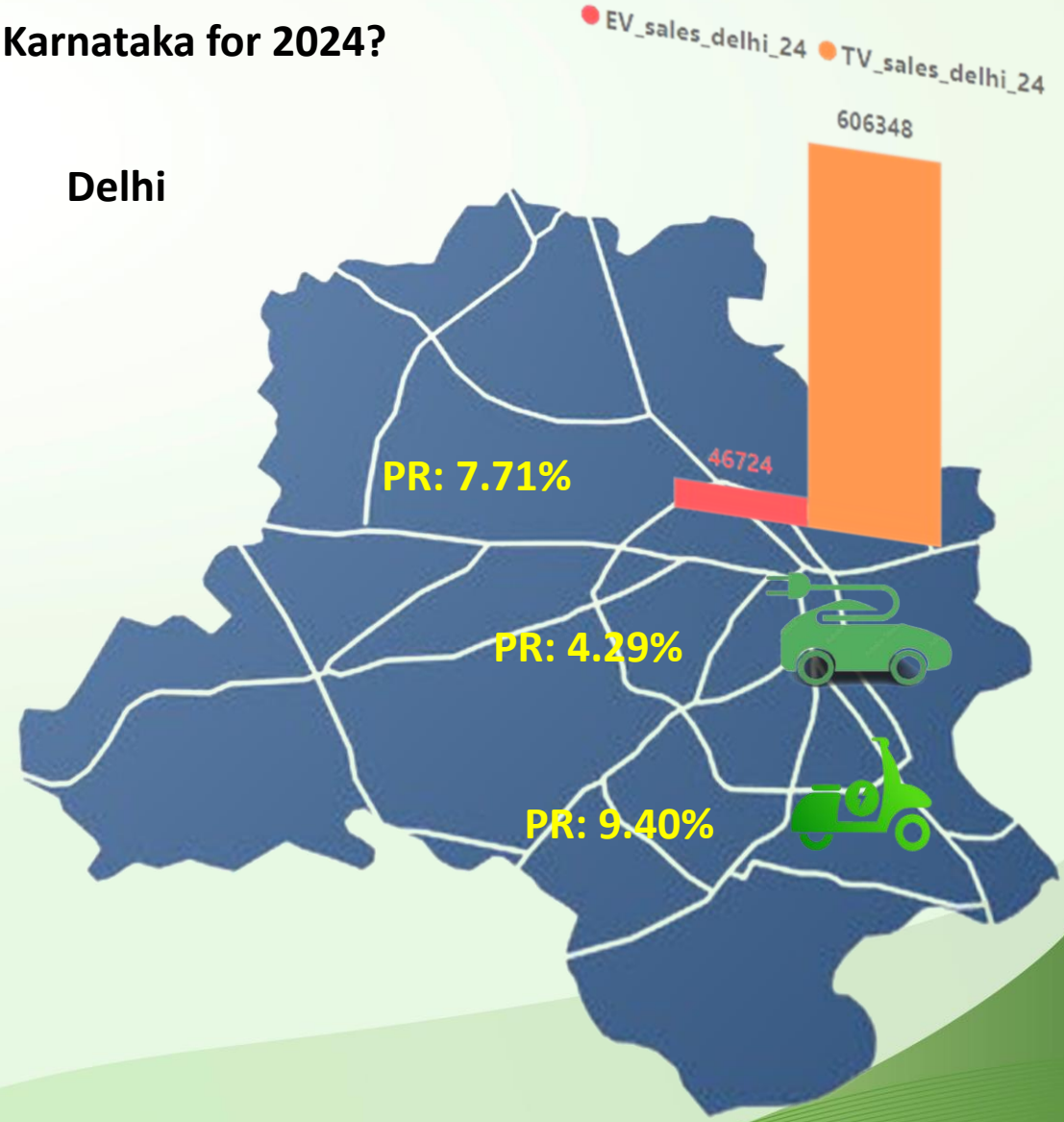


➢ **How do the EV sales and penetration rates in Delhi compare to Karnataka for 2024?**

Karnataka



Delhi



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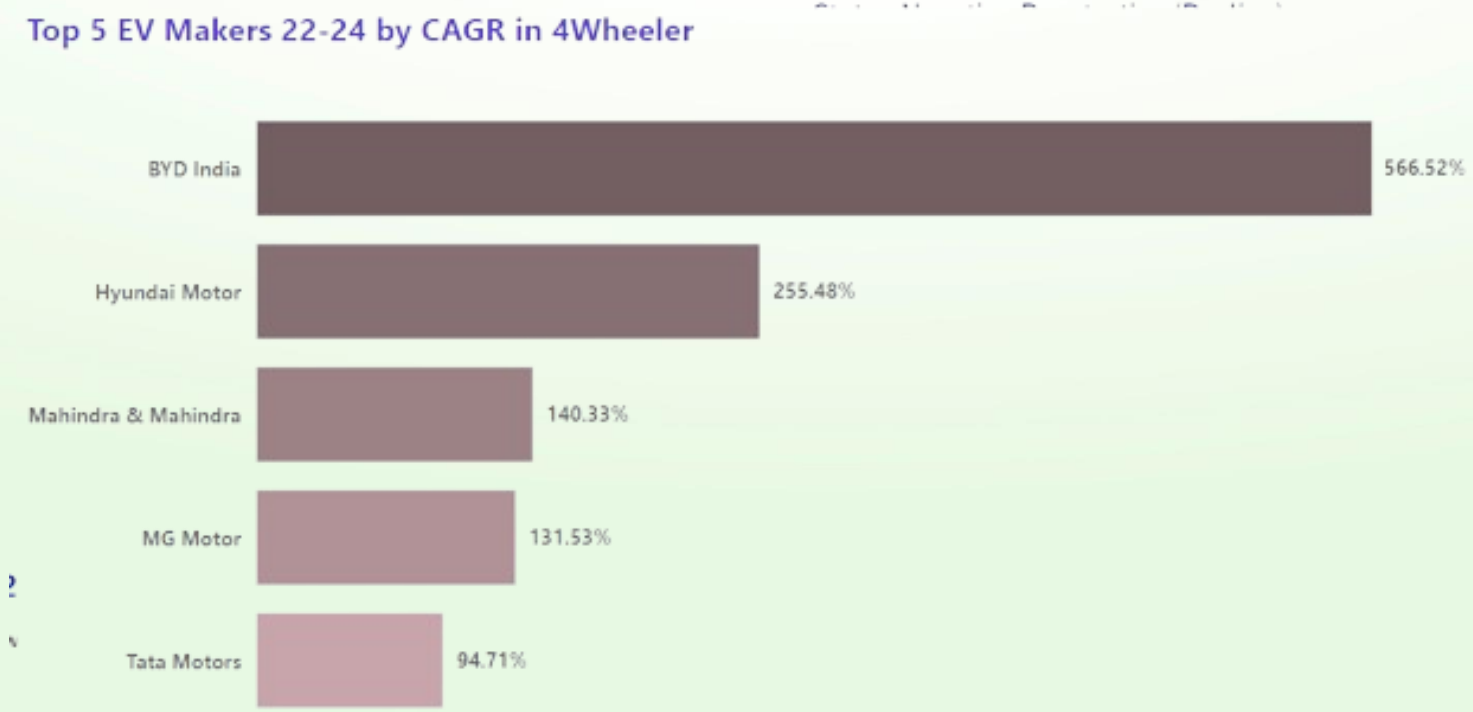
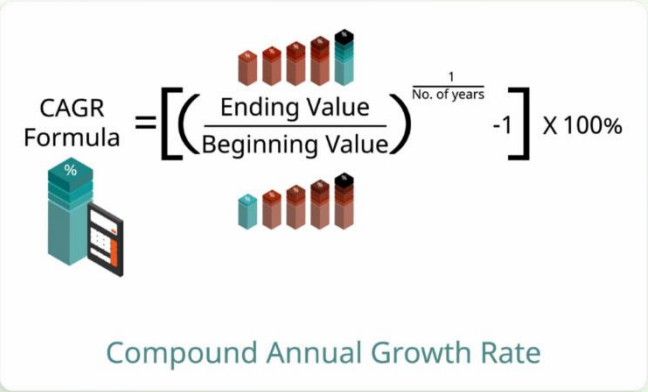
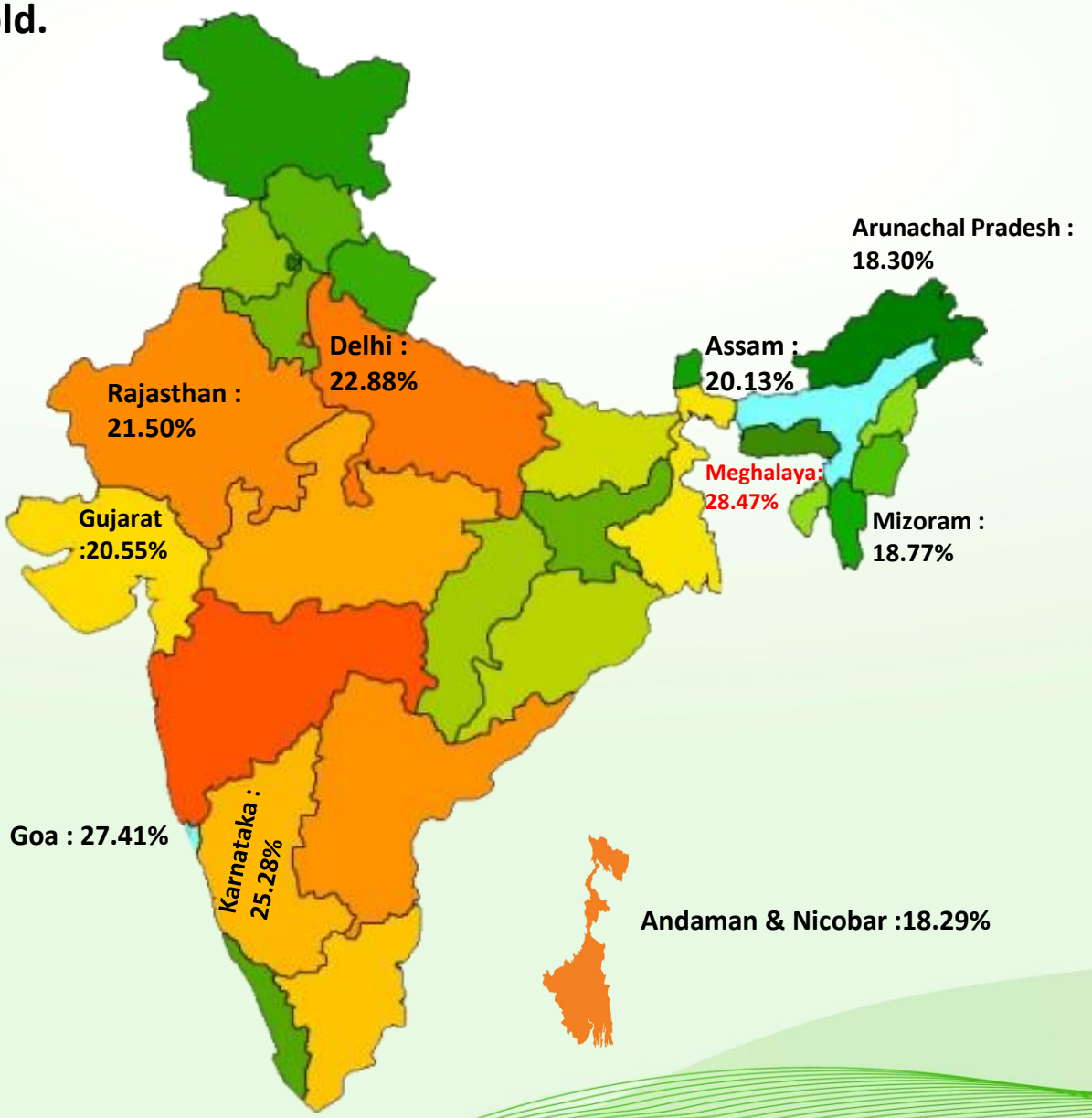
- **List down the compounded annual growth rate (CAGR) in 4-wheeler units for the top 5 makers from 2022 to 2024**.

  CAGR refers to the average annual growth rate of sales over a specified period, assuming the sales grew at a consistent rate each year. It is used to measure the performance of a company's sales growth over time, smoothing out the year-to-year fluctuations to provide a clearer picture of long-term trends.

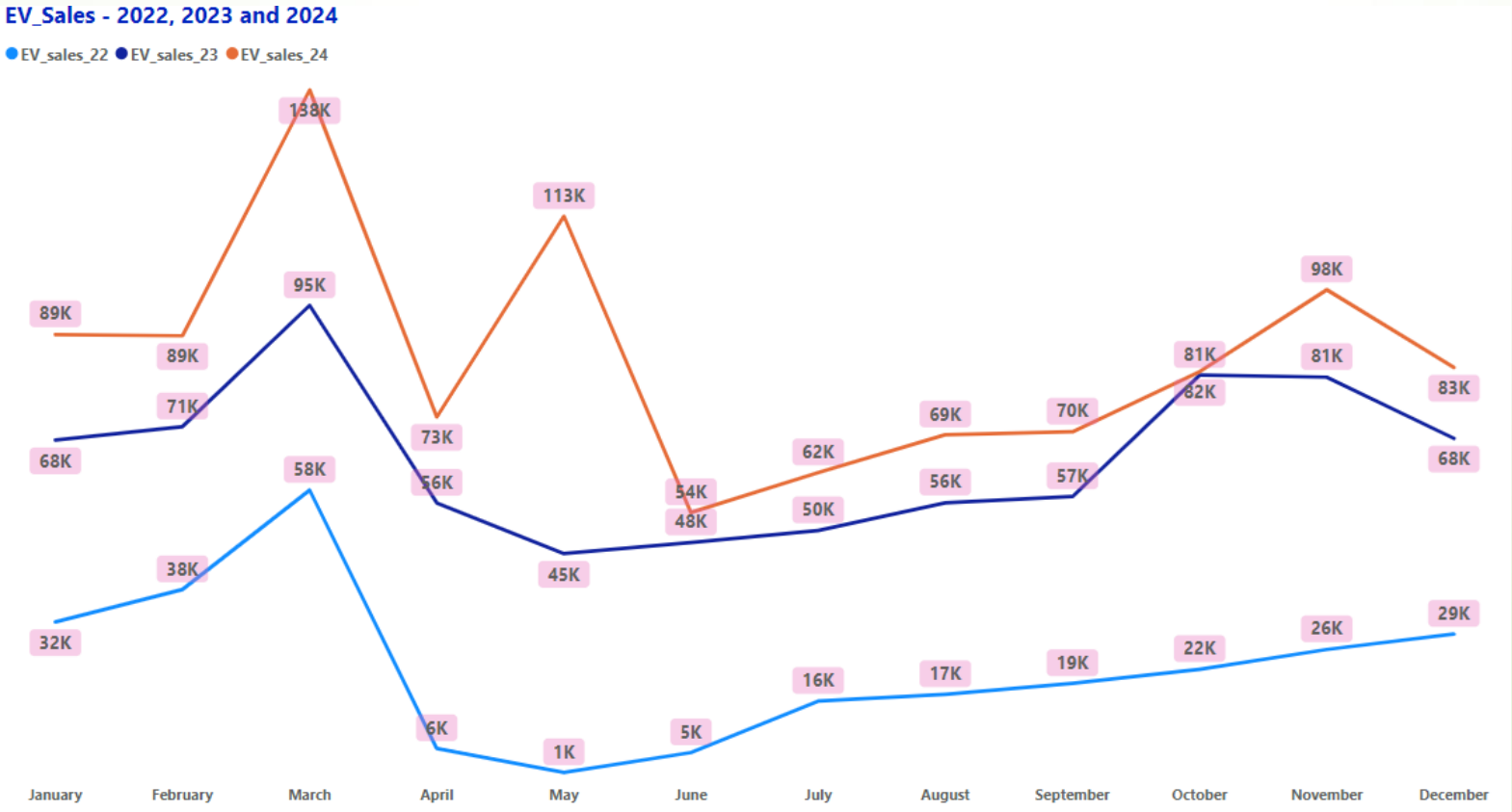




- **List down the top 10 states that had the highest compounded annual growth rate (CAGR) from 2022 to 2024 in total vehicles sold.**



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



Peak Season : March
Low Season: June, July & May

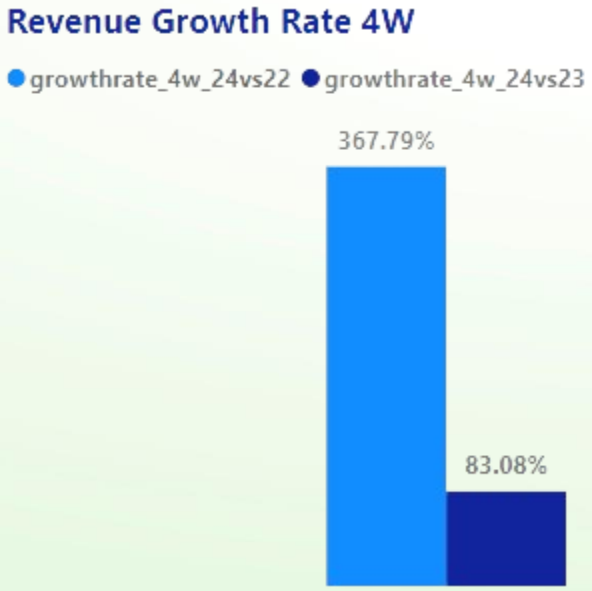
- **What is the projected number of EV sales (including 2-wheelers and 4 wheelers) for the top 10 states by penetration rate in 2030, based on the compounded annual growth rate (CAGR) from previous years?**

Projected Sales 2030 of Top 10 States Highest Penetration Rate

State	Penetration_rate	EV_sale_state	Proj_EV_sales_2030
Maharashtra	6.49%	396045	13.35M
Kerala	6.64%	137060	11.78M
Gujarat	4.40%	181389	8.65M
Karnataka	7.84%	312995	8.38M
Odisha	4.63%	78267	2.73M
Goa	9.84%	19684	2.42M
Rajasthan	4.55%	150366	2.40M
Tamil Nadu	4.30%	200062	1.58M
Delhi	6.76%	107312	1.05M
Chandigarh	4.04%	5279	0.99M

Maharashtra & Kerala: Highest EV Sales projected States.
Goa: Highest Penetration rate but projects less EV Sales in 2030

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



Secondary Research Insights

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- **What are the primary reasons for customers choosing 4-wheeler EVs in 2023 and 2024 (cost savings, environmental concerns, government incentives)?**

❑ Cost Savings

Lower running costs: Electricity is generally cheaper than petrol or diesel, leading to significant savings over time.
Reduced maintenance: EVs have fewer moving parts, resulting in lower maintenance expenses.

❑ Environmental Concerns

Zero tailpipe emissions: Contribute to cleaner air and reduced pollution in Indian cities.
Alignment with India's focus on sustainable development and climate change mitigation.

❑ Government Incentives

Subsidies and tax benefits: Central and state governments offer financial incentives to promote EV adoption as well as text benefits like GST (12% to 5%) & Income tax deductions of up to ₹1.5 lakh on interest paid on loans taken for EV purchase.
Charging infrastructure development: Increasing availability of charging stations is improving EV convenience.
FAME India Scheme Phase II: Subsidies on EV purchases and charging infrastructure development.
State-Specific Incentives: Road tax waivers, subsidies, and registration fee discounts.
Customs Duty Waivers: Exemptions on certain EV components to encourage local manufacturing and reduce import costs.

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

Impact of Government Incentives and Subsidies:

Reduced upfront cost: Subsidies directly lower the purchase price of electric vehicles (EVs), making them more affordable for consumers.

Increased affordability: Incentives make EVs accessible to more buyers, including those with budget constraints.

Boost to domestic manufacturing: Subsidies often encourage local production and assembly of EVs, potentially leading to job creation and technology transfer.

Infrastructure development: Government support for charging stations and related infrastructure is crucial for EV adoption, especially in urban areas

Environmental awareness: Incentives promote the use of cleaner vehicles, contributing to air quality improvement and reduced carbon emissions.

States with Notable EV Subsidies:

- **Maharashtra:** Offers substantial purchase subsidies for both 2-wheelers and 4-wheelers, along with road tax exemptions.
- **Delhi:** Provides significant subsidies for electric cars and two-wheelers, coupled with registration benefits.
- **Gujarat:** Offers incentives for EV manufacturing and purchase, aiming to establish itself as an EV hub.
- **Karnataka:** Provides subsidies and infrastructure support for electric buses and cars.
- **Tamil Nadu:** Offers subsidies for electric two-wheelers and three-wheelers, along with developing charging infrastructure.

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

Correlation Between Charging Stations Infrastructure and EV Sales & Penetration Rates in Top 5 States in India

1. Delhi

- **Charging Infrastructure**: Delhi has a well-developed network of public and private charging stations, including fast chargers.
- **EV Sales & Penetration**: High availability of charging infrastructure has led to increased consumer confidence, resulting in one of the highest EV penetration rates in the country.
- **Correlation**: Strong positive correlation as improved infrastructure supports higher sales and adoption rates.

2. Maharashtra

- **Charging Infrastructure**: Maharashtra has invested heavily in expanding its charging network, especially in major cities like Mumbai and Pune.
- **EV Sales & Penetration**: The robust charging infrastructure has contributed to a significant increase in EV sales and penetration.
- **Correlation**: Positive correlation as the ease of access to charging stations drives consumer adoption.

3. Gujarat

- **Charging Infrastructure**: Gujarat's strategic installation of charging stations along highways and urban centres has facilitated long-distance travel for EV owners.
- **EV Sales & Penetration**: The state's proactive approach in developing charging infrastructure correlates with its high EV sales and penetration rates.
- **Correlation**: Strong positive correlation due to infrastructure improvements directly enhancing the feasibility of EV ownership.

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4. Tamil Nadu

- **Charging Infrastructure**: Tamil Nadu has focused on setting up charging stations in residential areas, commercial hubs, and industrial zones.
- **EV Sales & Penetration**: The extensive infrastructure has led to increased confidence among buyers, reflected in rising EV sales and penetration.
- **Correlation**: Positive correlation as comprehensive infrastructure planning supports higher adoption rates.

5. Karnataka

- **Charging Infrastructure**: Karnataka, particularly Bangalore, boasts a significant number of charging stations, including those at tech parks and public places.
- **EV Sales & Penetration**: The availability of charging infrastructure has significantly boosted the state's EV market.
- **Correlation**: Strong positive correlation as the presence of charging stations alleviates range anxiety and promotes higher sales.

The availability of charging stations infrastructure is positively correlated with EV sales and penetration rates in the top 5 states in India. States with well-developed charging networks such as Delhi, Maharashtra, Gujarat, Tamil Nadu, and Karnataka have seen higher EV adoption rates. The correlation indicates that improving charging infrastructure is crucial for increasing EV sales and penetration.

➢ Which state of India is ideal to start the manufacturing unit? (Based on subsidies provided, ease of doing business, stability in governance etc.)

Choosing the ideal state for setting up a manufacturing unit in India requires a careful evaluation of various factors. While the landscape is dynamic, certain states have consistently demonstrated a favourable business environment

Key Factors to Consider:

- **Subsidies and Incentives:** Evaluate the specific industry you're in to identify states offering targeted incentives.
- **Ease of Doing Business:** Consider factors like registration, permits, and clearances.
- **Infrastructure:** Assess the availability of transportation, power, water, and logistics facilities.
- **Labour Availability and Skills:** Evaluate the skill set required for your industry and the availability of talent.
- **Land and Real Estate:** Consider the cost and availability of industrial land.
- **Market Access:** Proximity to your target market can be crucial.
- **Political Stability and Governance:** A stable government and efficient administration are essential.

Top Contenders:

- **Gujarat:** Known for its industrial infrastructure, skilled labour, and pro-business policies. It has a strong track record in attracting investments.
- **Maharashtra:** India's financial capital boasts a vast market, skilled workforce, and a developed industrial ecosystem.
- **Tamil Nadu:** Offers a skilled workforce, good infrastructure, and a focus on automotive and engineering sectors.
- **Karnataka:** Known for its IT prowess, it's also emerging as a manufacturing hub with a skilled workforce and supportive government policies.
- **Andhra Pradesh:** Offers industrial corridors, skilled labour, and a conducive business environment

Additional Considerations:

- **Specific Industry Focus:** Some states specialize in certain industries (e.g., textiles in Gujarat, IT in Karnataka).
- **Infrastructure Development:** Ongoing infrastructure projects can influence future business conditions.
- **Cost of Living:** Factor in the cost of living for your employees.

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

Potential Brand Ambassadors for AtliQ Motors in India

Choosing the right brand ambassador is crucial for a successful launch. Here are a few potential candidates who align with the EV/hybrid vehicle market in India:

- **A Young, Environmentally Conscious Celebrity:**
  - **Reasoning:** This demographic is a significant target market for EVs. A young, popular figure can resonate with the youth and promote a sustainable lifestyle.
  - **Examples:** Actors like Alia Bhatt, Ranbir Kapoor, or Deepika Padukone could be considered.
- **A Cricket or Sports Icon:**
  - **Reasoning:** Cricket enjoys a massive following in India, and sports personalities command a wide reach. They can appeal to a broad audience, including families and young professionals.
  - **Examples:** Virat Kohli, Rohit Sharma, or a popular cricketer from a regional market could be considered.
- **A Tech-Savvy Influencer:**
  - **Reasoning:** Influencers with a strong following in the tech and lifestyle space can effectively communicate the benefits of EVs. They can engage with the target audience through social media and digital platforms.
  - **Examples:** Popular tech YouTubers or social media influencers with a large following.
- **A Celebrity with a Strong Connection to India:**
  - **Reasoning:** A celebrity who resonates with Indian culture and values can create a strong emotional connection with the audience.
  - **Examples:** International celebrities with Indian roots or a strong fan following in India.

Key Considerations:

- **Brand Image:** The ambassador should align with AtliQ Motors' brand identity and values.
- **Target Audience:** Consider the primary target demographic for the EV vehicles.
- **Mass Appeal:** The ambassador should have a wide reach and influence.
- **Credibility:** The ambassador should be perceived as authentic and trustworthy.
- **Long-Term Commitment:** A long-term partnership with the ambassador can build brand loyalty.

➢ My recommendations for AtliQ Motors.

1. Strategic Marketing and Branding

Develop a Comprehensive Marketing Strategy:

- **Target Audience Segmentation**: Identify and segment the target audience based on demographics, psychographics, and behavioral factors to create tailored marketing campaigns.
- **Digital Presence**: Leverage digital marketing channels, including social media, search engine optimization (SEO), and online advertising to reach a wider audience.
- **Influencer Partnerships**: Collaborate with popular influencers and celebrities who align with the brand's values to enhance brand visibility and credibility.

Brand Ambassadorship:

- **Select a Prominent Brand Ambassador**: As discussed, Celebrity from cricket / Bollywood would be an ideal choice due to their popularity, influence, and alignment with the brand's values.
- **Consistent Brand Messaging**: Ensure that all marketing materials convey a consistent message emphasizing sustainability, innovation, and performance.

2. Enhance Customer Experience and After-Sales Service

Customer-Centric Approach:

- **Showroom Experience**: Create interactive and engaging showroom experiences where customers can learn about the features and benefits of EVs and hybrids.
- **Test Drives and Events**: Organize test drive events and educational workshops to familiarize potential customers with the vehicles and their advantages.

After-Sales Support:

- **Robust Service Network**: Establish a wide network of service centers to ensure easy access to maintenance and support for customers.
- **Customer Support Channels**: Implement multiple customer support channels, including phone, email, and chat, to provide timely assistance and resolve issues promptly.
- **Loyalty Programs**: Introduce loyalty programs to reward repeat customers and encourage brand loyalty.

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3. Infrastructure Development and Partnerships

Charging Infrastructure:

- **Expand Charging Network:** Invest in expanding the charging station network to enhance convenience for EV owners and reduce range anxiety.
- **Partnerships with Energy Providers:** Collaborate with energy companies to set up charging stations at strategic locations, such as shopping malls, office complexes, and residential areas.

Government and Industry Collaborations:

- **Leverage Government Incentives:** Take advantage of government incentives and subsidies for EV manufacturing and infrastructure development.
- **Industry Partnerships:** Form alliances with other companies in the EV ecosystem, including battery manufacturers, technology providers, and automotive suppliers, to strengthen the supply chain and drive innovation.

Sustainability Initiatives:

- **Green Manufacturing Practices:** Adopt sustainable manufacturing practices to reduce environmental impact and align with the brand's eco-friendly image.
- **Community Engagement:** Engage with local communities through sustainability initiatives and awareness campaigns to build a positive brand image and encourage EV adoption.

Thank You!