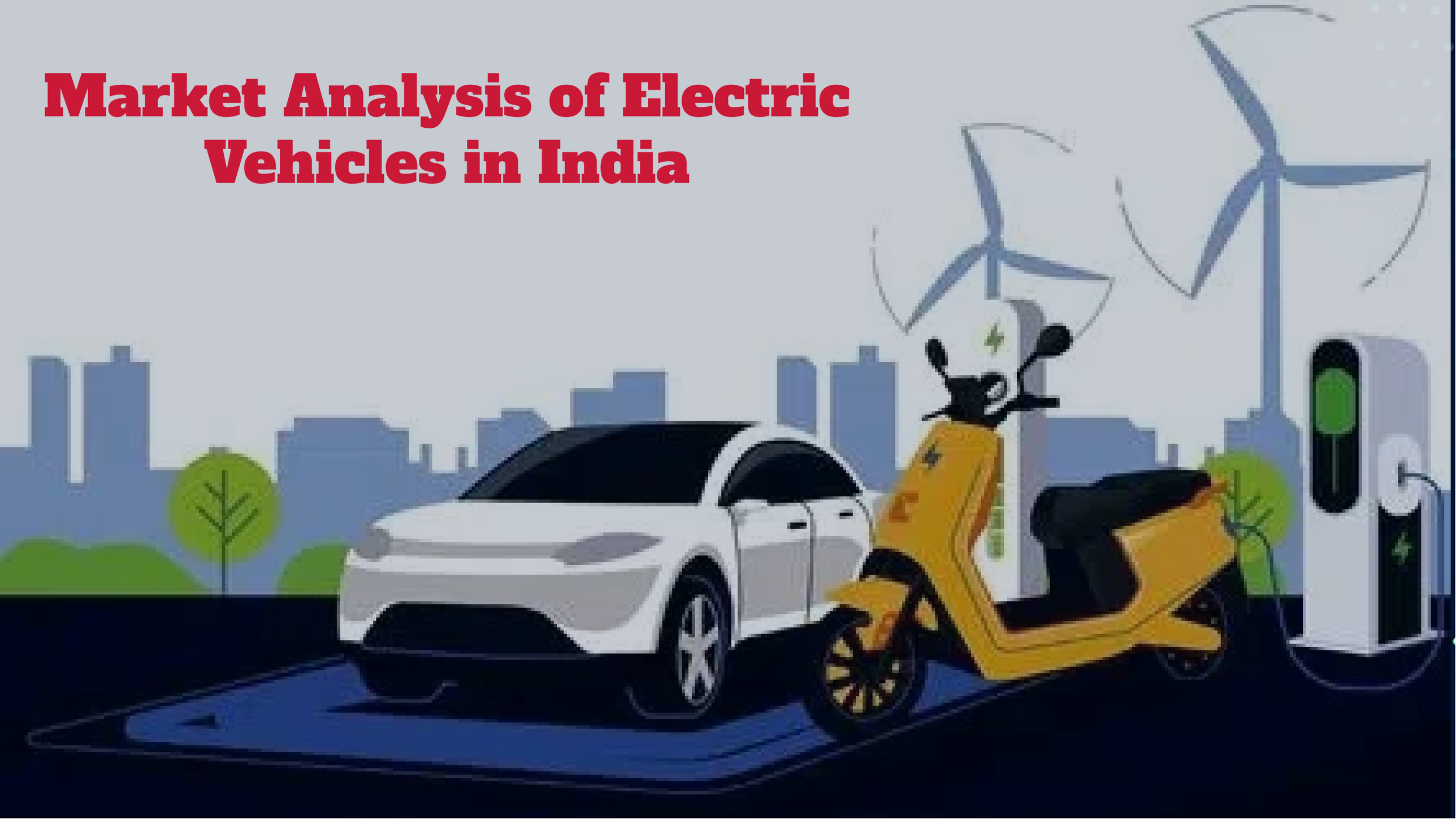
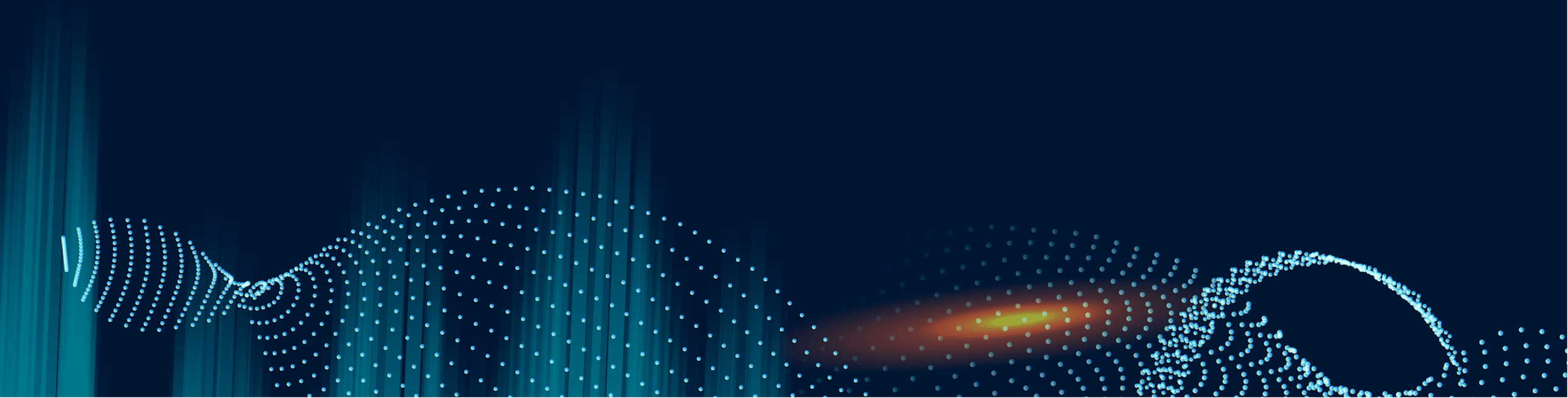
Market Analysis of Electric Vehicles in India



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.



Dashboard

Makers

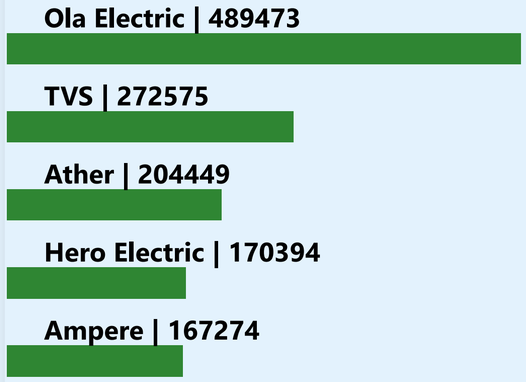
States

Comparison

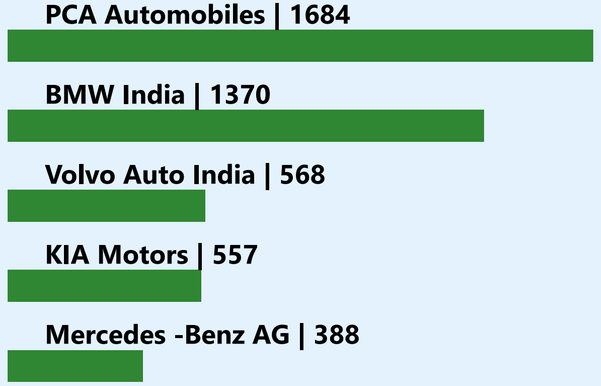
The Future of Electric Vehicles

ELECTRIC VEHICLE ANALYSIS

Top makers by electric vehicle sales



Bottom makers by electric vehicle sales



Peak and Low season months

2022

2023

2024

2-Wheelers

4-Wheelers

maker

Ampere

Ather

EV Sold

1019.6K✓

LY: 775.4K (+31.5%)

Revenue

392bn △% GR 114.9%

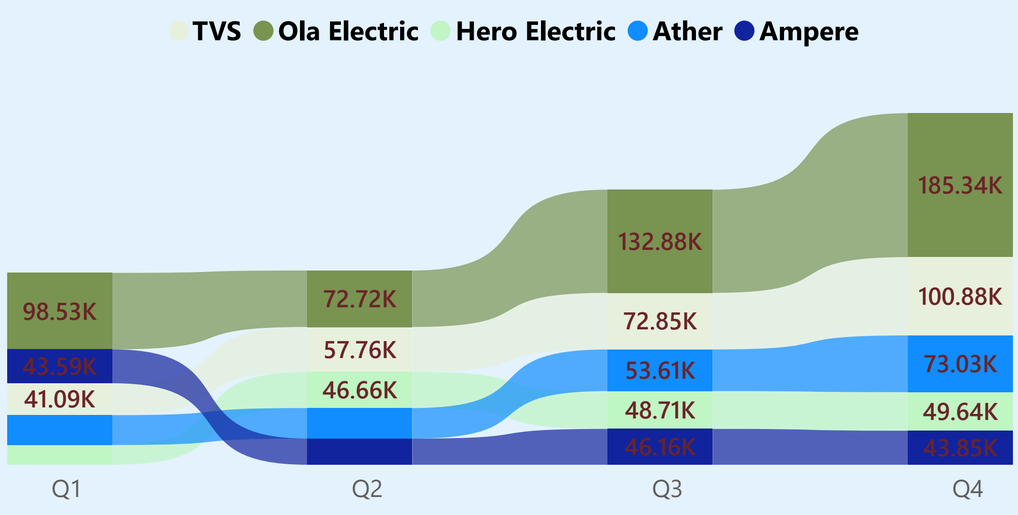
CAGR %

94%

Avg Sales

2.53K

Quarterly vehicle sales by makers



maker	CAGR	Market Share	Revenue
Tata Motors	94.71%	4.30%	133bn
Mahindra & Mahindra	140.33%	1.99%	62bn
Ola Electric	373.22%	23.69%	42bn
TVS	330.80%	13.19%	23bn
MG Motor	131.53%	0.67%	21bn
Ather	132.04%	9.90%	17bn
Hero Electric	-58.52%	8.25%	14bn
Ampere	46.01%	8.10%	14bn
Okinawa	-34.23%	8.00%	14bn

2-Wheelers

4-Wheelers

2022

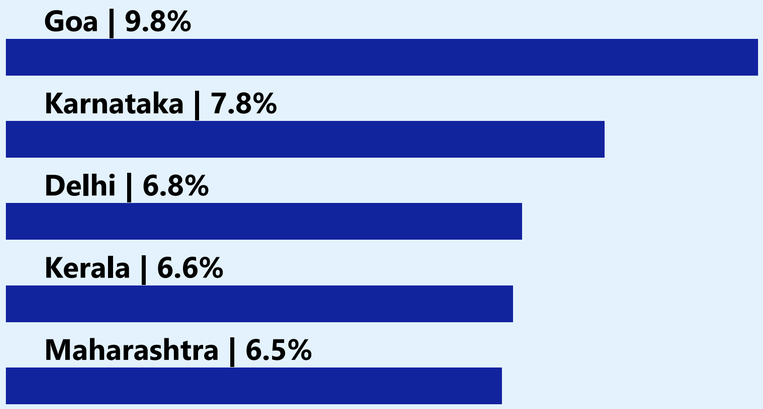
2023

2024

state

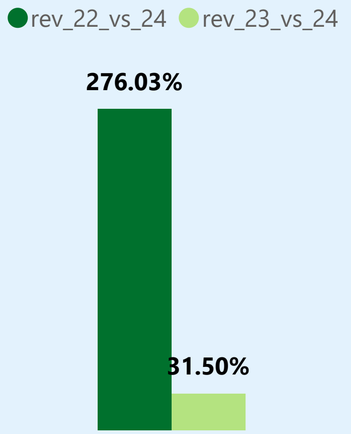
All

Penetration rate by states



State	Penetration_rate %	sales decline
Arunachal Pradesh	0.05%	1550%
Mizoram	0.48%	423%
Meghalaya	0.20%	302%
Nagaland	0.03%	225%
Uttar Pradesh	1.17%	154%
Puducherry	3.67%	127%
DNH and DD	0.82%	126%
West Bengal	1.12%	123%

revenue comparison



Penetration rate

4.8%✓

LY: 4.0% (+21.84%)

Revenue_total_vehicles

19.44T △% GR 58.2%

EV_sales

1.02M✓

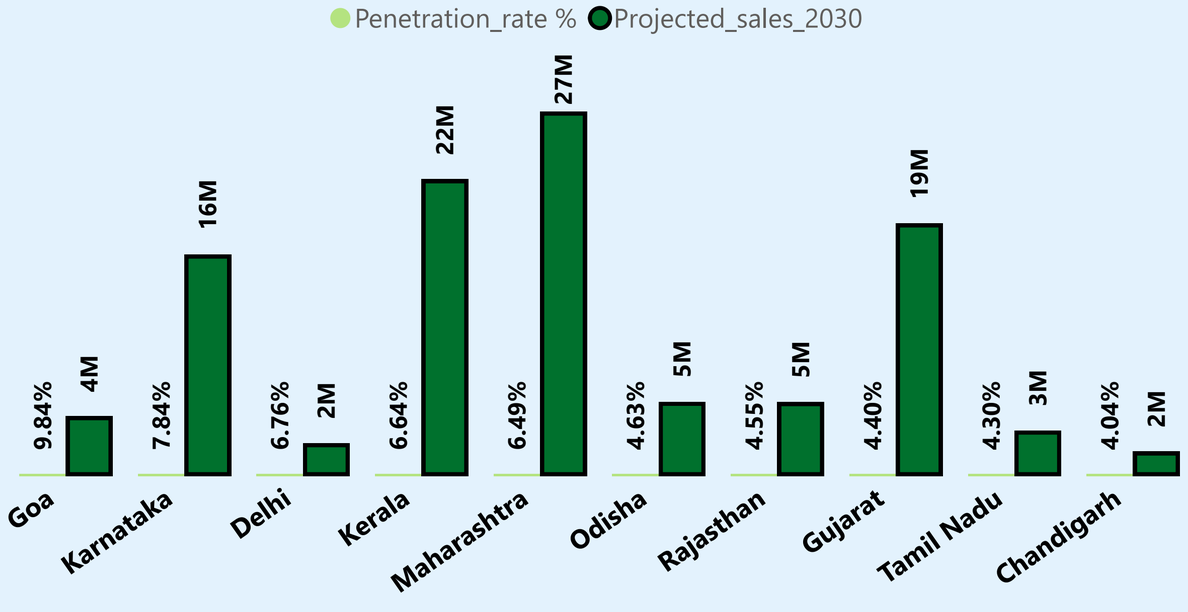
Goal: 0.78M (+31.5%)

Total_vehicles

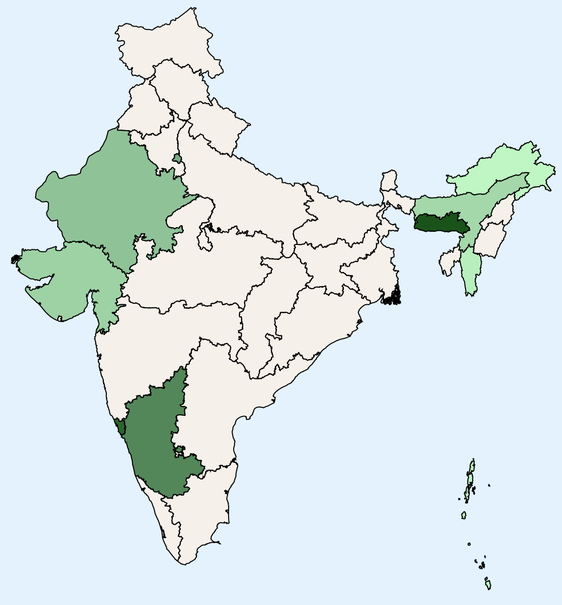
21.18M✓

Goal: 19.62M (+7.93%)

Projected number of EV sales



Top states of CAGR%

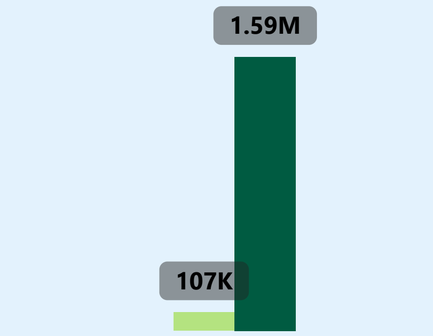


Andaman & Nicobar Island | Andhra Pradesh | Arunachal Pradesh | Assam | Bihar | Chandigarh

CAGR_Tv	CAGR %	EV_sales	Total_vehicles
13.56%	93.91%	2M	57M

DELHI

electric_sales total_vehicle_sales



Penetration_Rate

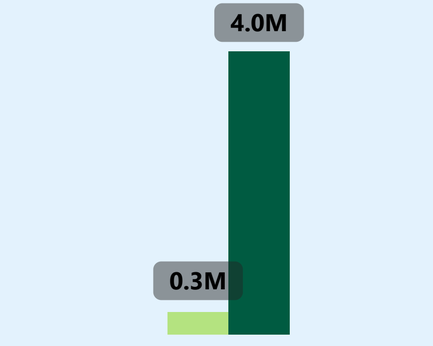
4.81%

PCS

1886

KARNATAKA

electric_sales_ total_vehicle_sales_

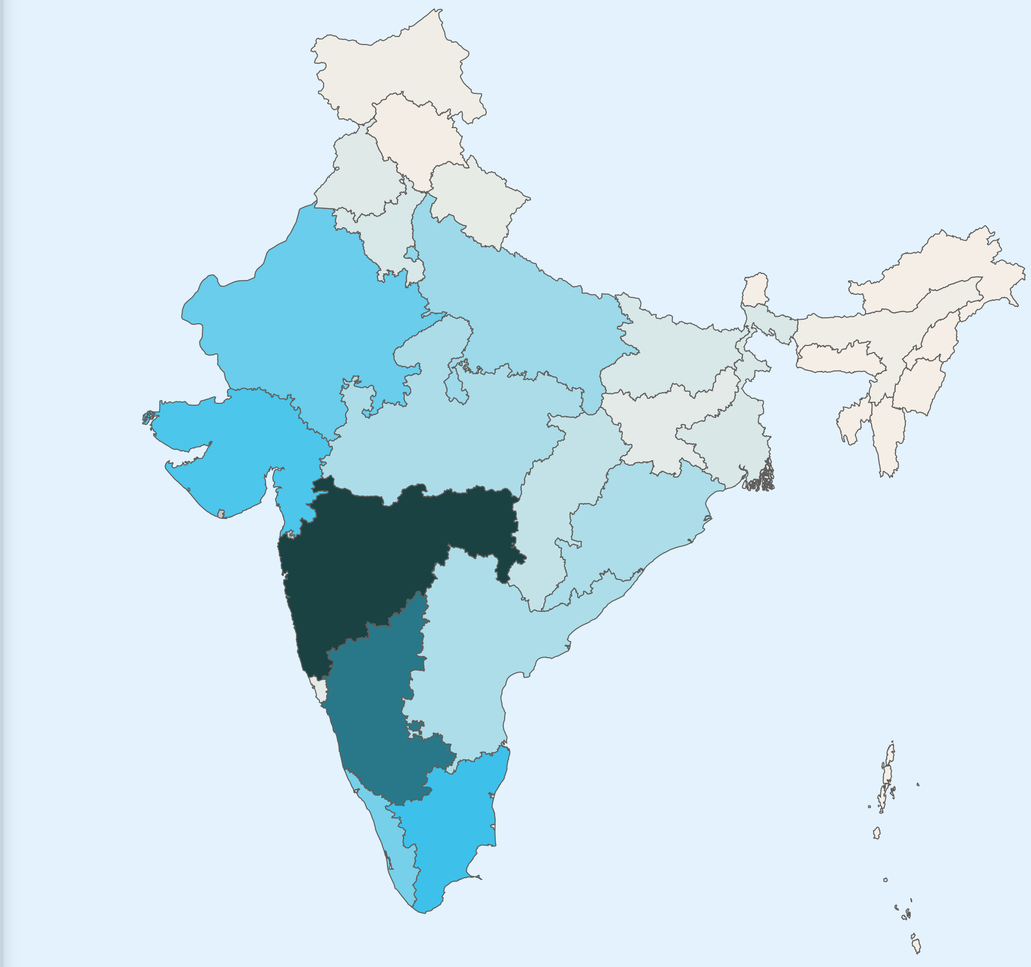


Penetration_Rate_

4.81%

PCS_

5130



2-Wheelers

4-Wheelers

2022

2023

2024

Secondary Questions

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

Battery Enabled Vehicles (BEVs) are a type of electric vehicle which uses chemical energy stored in rechargeable battery packs with no secondary source of propulsion. They do not have an IC engine or any fuel cells to power the vehicle. It uses electric motors for conversion of electrical energy into mechanical energy to power the wheels for motion.

Why EV?

- Electric vehicles are simpler - a battery plus motor and controller is all that’s replacing the entire engine and its related systems in ICE vehicles.Electric vehicles are more powerful (at least when it matters i.e. at low speed operations).

- Electric vehicles are greener and they can enable a zero-emission ecosystem, provided, that the grid shifts to renewable energy. Electric vehicles are smarter – electronic controls are 3-5x higher in EVs (as compared to ICE) and that translates into features beyond anything that consumers have seen beforemin an ICE vehicle.

Three Straightforward reason from ICE to EV:

- The depletion of fossil fuels is expected to lead to higher extraction costs, making petrol and diesel more expensive over time. Transitioning to EVs, which can be powered by electricity generated from renewable sources like wind, solar, and hydro, offers a more sustainable and cost-effective solution.

- Fossil fuel reserves are rapidly depleting, making the shift to EVs, which rely on electricity that can be generated from renewable sources, crucial for long-term energy sustainability.

- Volatile oil prices can destabilize the Indian economy by increasing the current account deficit and impacting the overall economic growth. The transportation sector, being one of the largest consumers of oil, is a significant contributor to this vulnerability. EVs, on the other hand, can reduce this dependence by utilizing domestically produced electricity, thereby insulating the economy from global oil price shocks.

4-Wheelers

- Lower Operating Costs: One of the most significant factors is the lower operating costs associated with EVs. Electric vehicles have fewer moving parts compared to internal combustion engine (ICE) vehicles, resulting in reduced maintenance costs. Additionally, electricity is generally cheaper than petrol or diesel, which means lower fuel costs for EV owners.

  As fuel prices continue to rise due to global market dynamics and environmental regulations, the cost advantage of EVs becomes even more pronounced, encouraging more consumers to make the switch.

- Reduction in Carbon Footprint: Environmental awareness is growing among consumers, and many are motivated to reduce their carbon footprint. EVs produce zero tailpipe emissions, making them a cleaner alternative to ICE vehicles. This is particularly appealing to environmentally conscious customers who want to contribute to reducing air pollution and combating climate change.

- Regulatory Support: Policies such as stricter emission norms, phased bans on ICE vehicles, and favorable regulations for EV manufacturers are creating a conducive environment for the growth of the EV market. Consumers are increasingly aware that the future of mobility is electric, prompting many to adopt EVs sooner rather than later

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

FAME (Faster Adoption and Manufacturing of Electric Vehicles):

- The main objective of the scheme is to encourage Faster adoption of Electric and hybrid vehicle by way of offering upfront Incentive on purchase of Electric vehicles and also by way of establishing a necessary charging Infrastructure for electric vehicles. The scheme will help in addressing the issue of environmental pollution and fuel security.

- The scheme is proposed to be implemented through the following verticals: Demand Incentives, Establishment of network of charging stations and administration of the scheme.

- FAME has led to a significant increase in the sales of electric 2-wheelers and 4-wheelers, particularly in urban areas. Public Transport.Many cities have begun adopting electric buses, reducing pollution and improving air quality.

GST Reduction on EVs Objective:

The Indian government reduced the Goods and Services Tax (GST) on electric vehicles to make them more affordable and competitive with traditional vehicles.

- The GST on electric vehicles was reduced from 12% to 5%, significantly lowering the price of EVs.
- The lower GST directly reduces the retail price of EVs, making them more attractive to consumers. This tax benefit has contributed to the increased adoption of EVs, particularly in price-sensitive markets.

States:

- States like **Andhra Pradesh, Uttar Pradesh, Tamil Nadu and Telangana** offer incentives such as capital interest subsidy, stamp duty reimbursements, tax exemptions, SGST reimbursement and provision of interest free loans to incentivize EV manufacturers
- The recently introduced EV policy of the **Delhi** government has a greater focus on demand-side incentives. The policy offers purchase incentives for EVs as well as scrappage incentives for ICE vehicles

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

- Charging Infrastructure and EV Sales: States with more extensive charging infrastructure tend to have higher EV sales. This is because the availability of charging stations reduces range anxiety and makes EVs a more practical choice for consumers

- . Charging Infrastructure and Penetration Rates: Penetration rate refers to the proportion of EVs compared to all vehicles. A higher number of charging stations often correlates with a higher penetration rate, as it signals that the state is more prepared to support EV adoption, making it easier for people to switch from traditional vehicles.

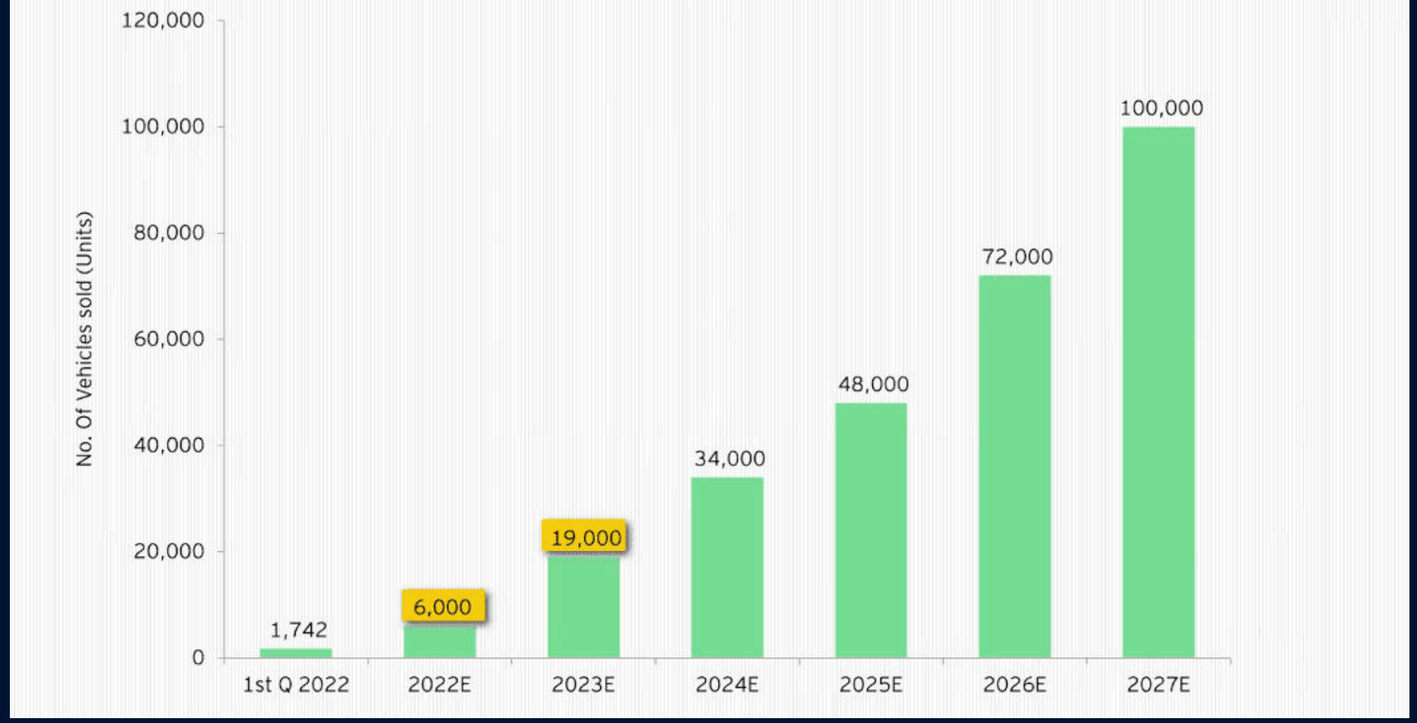
Maharashtra: Maharashtra has the highest EV sales. The availability of a decent number of charging stations likely helps support these high sales, although the penetration rate is moderate, indicating room for growth.

Karnataka:: Karnataka has the most charging stations and a high penetration rate. This suggests that good charging infrastructure strongly encourages EV adoption in the state.

Kerala: Kerala has fewer charging stations but still maintains a decent penetration rate. This indicates that even with limited infrastructure, other factors like state policies or incentives might be helping EV adoption.

Delhi: Delhi has a moderate number of charging stations and sales. The penetration rate is similar to Kerala's, showing that more charging stations alone might not lead to significantly higher penetration without other supportive factors.

Goa: Goa has the highest penetration rate with the fewest charging stations. This suggests that in smaller, more concentrated regions, even a limited number of charging stations can be effective in driving high EV adoption.



- Rapid Growth in Charging Stations: The number of charging stations is projected to increase significantly from 1,742 in the first quarter of 2022 to 100,000 by 2027. This indicates a substantial investment in charging infrastructure to support the growing EV market.

- Consistent EV Sales Growth: The number of EVs sold is also expected to rise steadily, from 6,000 units in 2022 to 72,000 units in 2026.

- Correlation Between Charging Stations and EV Sales: The graph suggests a strong correlation between the availability of charging stations and EV sales. As the number of charging stations increases, we can expect a corresponding rise in EV adoption.

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

- ***Rana Daggubati*** could attract younger, environmentally conscious consumers. and involves in various initiatives and technologies—ranging from entrepreneurship and digital media to environmental sustainability and innovative tech

- ***S.S. Rajamouli*** could add credibility, creativity, and a sense of aspiration to the brand.

- ***Sunil Chhetri*** could connect with sports enthusiasts and promote the brand's values of performance and national pride.

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

Gujarat:

- The state has become a hub for EV manufacturing, attracting both new investments and expansions from existing car manufacturers. MG Motors has recently begun manufacturing its newly launched EV at its plant in Halol and has announced plans for a second plant with a Rs 5,000 crore investment. Maruti Suzuki, India's largest car maker, will roll out its first electric vehicle from its plant in Gujarat this year. Tata Motors has also operationalized its newly acquired car manufacturing plant in Sana .and will soon start production of its electric car, the Nexon.
- With the support of government policies and investments, Gujarat is well on its way to becoming a major player in the EV industry. The state's growing EV ecosystem, including manufacturing, charging infrastructure, and technological advancements, is driving the widespread adoption of EVs.

Uttar Pradesh

- Uttar Pradesh has been one of the top beneficiaries of FAME II scheme. As on May 2024, the state has availed subsidies worth more than INR 395 crores which is ~6% of total subsidies disbursed nationwide under FAME II.

- Uttar Pradesh has introduced the Uttar Pradesh Electric Vehicle Policy 2022, which provides various incentives for EV manufacturers, such as subsidies on capital investments, tax rebates, and support for charging infrastructure.

Maharasthtra:

- As of May 2024, Maharashtra has availed subsidy worth more than INR 1,148 crores which is 17.75% oftotal subsidy disbursed nationwide under FAME II.

- As of May 2024, the state has 3,083 public EV charging stations, the second highest number in the country. This is approximately 19% of the total PCSs nationwide5 .

Karnataka:

- As of May 2024, Karnataka has effectively utilized the FAME-II subsidy program by securing subsidiesworth over INR 1,002 crores which is approximately 15% of the total subsidies disbursed nationwide.

- As on May 2024, Karnataka is leading the charge with 5,130 operational PCS which is 31.38% of thenationwide total. Karnataka's dominance in charging infrastructure aligns with its high sales of E2Wsand E-Cars.

Recommendation

Leverage Tier-II and Tier-III Cities:

While metropolitan areas like Delhi, Mumbai, and Bangalore are saturated markets, Tier-II and Tier-III cities represent untapped potential. These areas are rapidly urbanizing and have a growing middle class that is becoming environmentally conscious.

Strategy: Focus on creating affordable EV options tailored to the needs of consumers in these regions. Partner with local governments to set up charging infrastructure, and run awareness campaigns highlighting the benefits of EVs.

Battery Swapping Technology:

One of the significant barriers to EV adoption is the limited range and long charging times. Battery swapping stations can address these concerns by allowing users to quickly exchange a depleted battery for a fully charged one.

Strategy: Develop and deploy a network of battery-swapping stations across key urban and suburban areas. This can make EVs more appealing to consumers who are concerned about range anxiety and charging times.

Recommendation

Empowering EV Adoption Through Accessible Charging Solutions

Charging infrastructure in India is limited, causing range anxiety for potential EV buyers. By making charging more accessible at homes, parking lots, workplaces, and popular spots, AtliQ Motors can make EV ownership more convenient and attractive, driving greater adoption.

Strategy:Provide home charging kits with every EV purchase. Partner with parking facilities, workplaces, and commercial spots to install chargers in key locations. This ensures that customers can easily charge their vehicles wherever they go, making EVs a more practical choice.4o

Collaboration with Ride-Hailing Services:

Ride-hailing services like Ola and Uber are major players in the Indian transportation sector. Collaborating with them to introduce EV fleets can rapidly increase market penetration.

Strategy: Partner with these companies to provide EVs for their fleets. Offer special discounts or incentives to drivers who switch to electric, and work on establishing charging infrastructure at key locations used by ride-hailing services.

Thank You