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ACCELERATING ELECTRIC VEHICLE ADOPTION IN INDIA

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Introduction

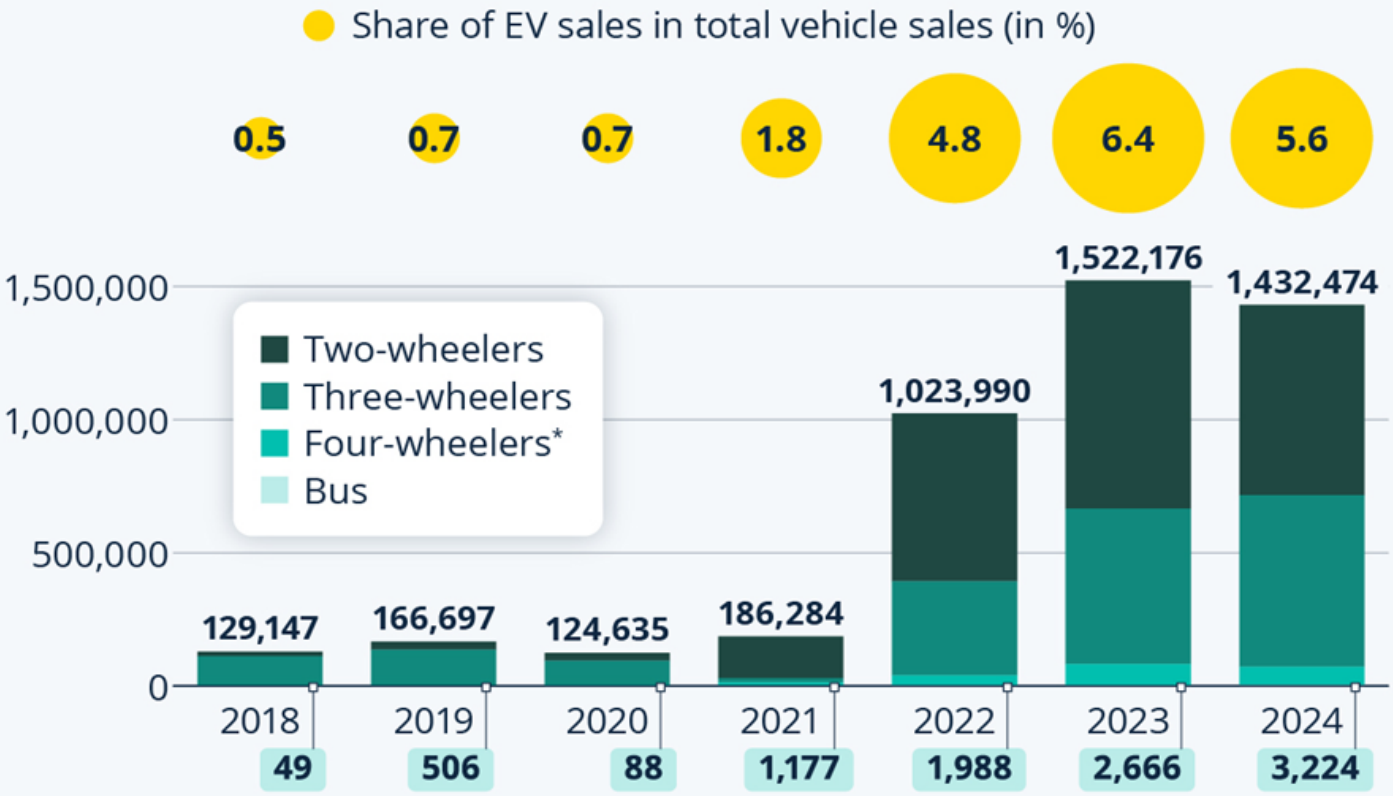
India is witnessing a paradigm shift in the transportation sector with the growing emphasis on electric vehicles (EVs) as a sustainable alternative to conventional fossil-fuel-powered vehicles. EV adoption is critical for reducing greenhouse gas emissions, improving urban air quality, and achieving India's climate targets under the Paris Agreement. The government's push through policies like the Faster Adoption and Manufacturing of Electric Vehicles (FAME) scheme, along with incentives for manufacturers and consumers, reflects India's commitment to building a clean, energy-efficient, and low-carbon mobility ecosystem.

NITI Aayog, the Government of India's premier policy think tank, recently released a crucial report titled ***"Unlocking a $200 Billion Opportunity: Electric Vehicles in India."***

Current scenario

India's EV Adoption in Reverse?

Electric vehicle sales in India, by year and type



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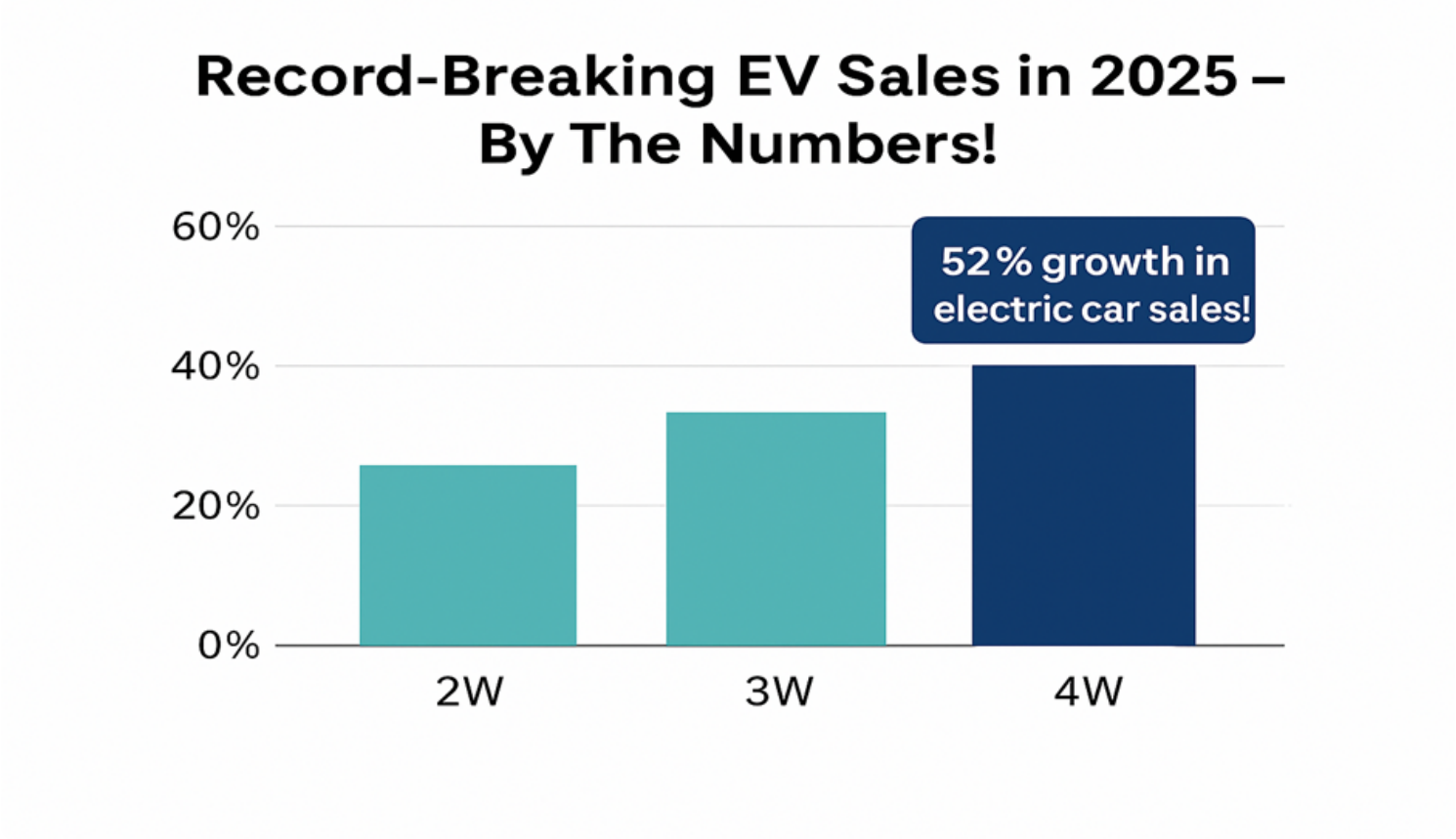

Why India Needs to Accelerate EV Adoption?

1**Reducing Dependence on Oil Imports**

oIndia imports over 80% of its crude oil, making the economy vulnerable to global price fluctuations and geopolitical risks.

oEV adoption reduces crude oil consumption and enhances energy security.

oExample: Switching to EVs in the transport sector could save billions of dollars in import bills annually.

2**Mitigating Air Pollution and Health Risks**

oTransport contributes significantly to urban air pollution, with cities like Delhi and Mumbai frequently recording hazardous air quality.

oEVs produce zero tailpipe emissions, reducing particulate matter (PM2.5) and NOx levels.

oExample: Adoption of EV buses in Bengalurand Pune has already contributed to lower local air pollution.

3**Meeting Climate Change Commitments**

oIndia has pledged to achieve net-zero carbon emissions by 2070 under the Paris Agreement.

oAccelerating EV adoption is critical to reducing transport sector emissions, which account for ~14% of India's total GHG emissions.

4**Reducing Fuel Costs for Consumers**

oElectricity is cheaper than petrol/diesel per kilometre travelled.

oEV adoption helps consumers save on operational costs, making transportation more affordable in the long run.

5**Promoting Indigenous Manufacturing & Technology**

oEV adoption drives growth in battery manufacturing, power electronics, and EV components, reducing reliance on imports.

oExample: India's push for battery giga factories (e.g., in Gujarat and Tamil Nadu) aligns with the Make in India initiative.

6**Boosting Renewable Energy Integration**

oEVs can be charged using solar or wind energy, supporting the transition to clean electricity and reducing fossil fuel consumption.

oExample: Delhi Metro and some EV fleets use solar-powered charging stations.

7**Global Competitiveness and Leadership**

oCountries accelerating EV adoption (China, EU, USA) are gaining technological leadership in **mobility, batteries, and charging infrastructure**.

oIndia risks falling behind unless it promotes EV adoption aggressively.

8**Long-Term Economic and Job Growth**

oEV adoption stimulates new jobs in manufacturing, charging infrastructure, software, and maintenance, while fostering innovation in the mobility sector.

Challenges in Adopting EV in India

1. High Upfront Costs

- EVs generally have a higher purchase price compared to conventional vehicles, primarily due to expensive batteries.
- For instance, retrofitting an old petrol or diesel car with an electric powertrain can cost around ?3 lakh, which is often close to the price of a new vehicle.

2. Limited Charging Infrastructure

- As of early 2025, India had approximately 5,319 public charging stations across 231 cities, which is insufficient for the growing number of EVs
- Many rural and semi-urban areas remain "charging deserts," lacking access to reliable charging points.

3. Range Anxiety

- Consumers often fear that EVs will run out of battery before reaching a charging station, especially on long trips.
- This concern is exacerbated by the uneven distribution of charging infrastructure, particularly in less urbanized regions.

4. Battery Disposal and Recycling Issues

- The disposal and recycling of EV batteries pose environmental challenges.
- India lacks a robust system for managing used batteries, leading to potential environmental hazards

5. Inadequate Financing Options

- Financial institutions perceive EVs, especially buses and trucks, as high-risk investments, making it difficult for fleet operators to secure loans.
- There is a lack of innovative financing tools and risk guarantees to support EV adoption

6. Consumer Awareness and Trust Deficit

- Many consumers and fleet operators are skeptical about the performance and reliability of EVs.
- This lack of trust hampers the adoption of EVs, despite government incentives and subsidies

7. Supply Chain and Manufacturing Challenges

- India faces challenges in sourcing critical components like lithium-ion batteries and rare earth materials, often relying on imports.
- Disruptions in global supply chains can affect the availability and cost of these components

8. Policy Implementation Gaps

- While policies like FAME II and state-level incentives exist, their implementation is inconsistent across regions.
- For example, Gujarat, despite being a leader in renewable energy, ranks 16th in EV adoption due to low subsidies and inadequate charging infrastructure

Government Initiatives

- **E-Amrit Portal:**India launched this portal at the COP26 Summit to serve as a one-stop information hub for electric vehicles.
- **National Electric Mobility Mission Plan (NEMMP) 2020:**Launched in 2012, this plan promotes hybrid and electric vehicles, aiming for 6-7 million sales of these vehicles annually from 2020 onwards through fiscal incentives.
- **FAME (Faster Adoption and Manufacturing of (Hybrid and) Electric Vehicles) Scheme:**
- Launched in April 2015 under NEMMP to encourage EV/hybrid vehicle purchases with financial support.
- Phase I ran until 2019.
- Phase II (FAME II) is a 3-year subsidy program focusing on electrifying public and shared transportation, also financing charging infrastructure.
- **GST restructuring:**GST on electric vehicles has been reduced from 12% to 5%, and on chargers/charging stations from 18% to 5%.
- **Production Linked Incentive (PLI) scheme:**
- For manufacturing Advanced Chemistry Cell (ACC) in the country to reduce battery prices.
- Auto and Auto component PLI Scheme covers hydrogen fuel cell based Zero Emission Vehicles (ZEVs)

PM e-Bus Sewa Scheme for Public Transport: launched by the Ministry of Housing and Urban Affairs, seeks to deploy 10,000 e-buses on a PPP model, offering central assistance for infrastructure development at varying levels based on state and city types.

EV Mitra Scheme: The EV Mitra Scheme simplifies the process for EV owners to claim subsidies and incentivizes awareness about the benefits of electric vehicles

Conclusion

India's EV market is on an upward trajectory, with significant growth in sales and regional adoption. While challenges persist, ongoing investments, supportive policies, and increasing consumer awareness are paving the way for a sustainable and electrified transportation future.

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