

GYANIKI

YOUR ACCESS TO FUTURE MOBILITY

UN REGULATION 155 AND CYBER RESILIENCE ACT





INDIA EV SALES MAY 2025

TOP MONEY
MOVEMENT IN
MOBILITY WORLD





NEWS, JOINT VENTURES & PARTNERSHIPS





UPCOMING EV SHOW

EV LAUNCH



GYANIKI REPORTS

'gyaniki' undertakes specialized and customized research in the areas of Future Mobility.

'gyaniki' provides an online repository for understanding the mobility ecosystem.

'gyaniki' database covers manufacturers, suppliers, technologies and ecosystem players in mobility including Electric, Autonomous, ADAS, Connected and Shared vehicles.

'gyaniki' also provides training programs across mobility domains.

10 Years of Devise: A Decade of Innovations and Excellence



Devise Electronics Pvt. Ltd. is Shaping the Future of Mobility in India

As the electric vehicle (EV) sector in India accelerates, 2025 marks a pivotal milestone for Devise Electronics Pvt. Ltd.—a company that has spent the last decade at the forefront of sustainable innovation, engineering excellence, and transformative partnerships in the automotive industry.

A Visionary Start and Relentless Pursuit of Excellence





Founded in 2015, Devise Electronics began with a bold vision: to redefine mobility through technology-driven, sustainable solutions. Under the leadership of Director Shekhar Malani, the company quickly established itself as a trusted name in the EV and automotive ecosystem, consistently pushing the boundaries of what's possible in electric mobility and automotive engineering.





Devise Driving Innovation Across the Mobility Spectrum









Over the past ten years, Devise has delivered a comprehensive suite of solutions, including:

- Electric Vehicle Systems Engineering
- Advanced Automotive Products and Solutions
- E-Mobility Lab Development for research and training
- Mobility Skill Development initiatives
- Battery Testing and Simulation Solutions
- Custom R&D Platforms for both OEMs and startups

With a strong commitment to the "Make in India" initiative, Devise's products have empowered EV manufacturers, Tier 1 suppliers, and educational institutions to design, test, and deploy next-generation mobility solutions that are both innovative and environmentally responsible.









Devise Partnerships Powering Progress









Devise's journey is defined by collaboration. The company's 10-year celebration honored partners who have been instrumental in its success, including **Mahindra**, **Tata Motors**, **Euler Motors**, **KPMG**, **MathWorks**, **and leading academic institutions**. These partnerships have fostered a culture of shared purpose and continuous improvement, ensuring that every innovation is built on a foundation of trust, expertise, and mutual respect.







devise Mears Of Excellence!

Team Devise





Team of Innovators and Changemakers

At the core of Devise's achievements is its team—a diverse group of engineers, thinkers, and problem-solvers dedicated to advancing clean mobility. Their collective expertise and passion have cultivated a culture of curiosity, integrity, and lifelong learning, making every milestone a stepping stone toward greater impact.

The Road Ahead: Engineering a Greener Tomorrow

Looking forward, Devise Electronics is poised to lead the next wave of mobility innovation by focusing on:

- Clean mobility and sustainable transportation
- Advanced EV infrastructure and smart charging solutions
- Supporting emerging OEMs and startups with tailored R&D platforms
- Developing next-gen technologies: Edge AI, Power Electronics, ADAS, Cybersecurity, Digital Twin Technology, Software-Defined Vehicles (SDV), Connected Tech, and Circular Economy solutions

By enabling its partners to engineer smarter, greener vehicles, Devise is not just responding to the demands of today's market—it is actively shaping the future of mobility in India and beyond.

As India's EV market continues its upward trajectory, Devise Electronics Pvt. Ltd. stands ready to empower the industry's next generation of leaders, innovators, and visionaries—driving the nation closer to a sustainable, electrified future

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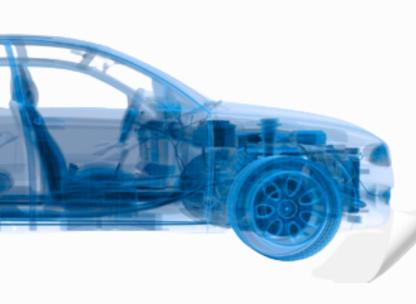


UN Regulation 155 and the Cyber Resilience Act



The Critical Role of UN Regulation 155 and the Cyber Resilience Act in Automotive Cybersecurity

The automotive industry is undergoing a transformation driven by increasing digitalization and connectivity across all vehicle categories, including motorcycles. While UN Regulation No. 155 (UNR155) has established a global framework for vehicle cybersecurity, the newly introduced Cyber Resilience Act (CRA) expands the landscape by addressing cybersecurity requirements for digital products more broadly. Understanding why the CRA is needed alongside UNR155, and how both affect vehicle and component manufacturers, is essential for navigating today's complex regulatory environment.



UN Regulation No. 155: Now Covering Motorcycles and More

UNR155 mandates a Cybersecurity (CSMS) Management **System** manage risks throughout the vehicle lifecycle-from design to post-production. This regulation requires manufacturers to conduct risk assessments based on attack defined vectors. implement cybersecurity controls, monitor respond to cyber incidents, and manage cybersecurity risks in the supply chain.

As of mid-2024, UNR155's scope has been extended to include **motorcycles**, **scooters**, **and electric bicycles exceeding 25 km/h (vehicle category L)**. This expansion reflects the increasing connectivity and complexity of two-wheelers, which now feature advanced driver assistance and connectivity systems, making them vulnerable to cyber threats just like four-wheeled vehicles.



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UN Regulation 155 and the Cyber Resilience Act



What is the Cyber Resilience Act (CRA)?



The CRA is a horizontal EU regulation introduced in December 2024 that sets baseline cybersecurity requirements for all products with digital elements sold in the European Union. Unlike UNR155, which is vehicle-specific, the CRA applies broadly across industries and product categories, including hardware and software products with embedded digital components, aftermarket automotive products such as telematics devices and diagnostic tools, cloud and backend systems connected to vehicles, and vehicles like non-road agricultural and construction machinery.

The CRA aims to improve consumer safety and trust by enforcing cybersecurity throughout the entire product lifecycle, from design and development to maintenance and decommissioning. Non-compliance can lead to significant fines and market restrictions.

The CRA is a **horizontal EU regulation** introduced in December 2024 that sets baseline **Why is CRA Needed When UNR155 Exists?**

UNR155 provides a detailed regulatory framework specifically for vehicle cybersecurity but does not cover all digital products related to or connected with vehicles. The CRA fills this gap by addressing cybersecurity requirements for **digital products and components that fall outside the scope of vehicle type approval under UNR155**.



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UN Regulation 155 and the Cyber Resilience Act



UNR155 applies to complete vehicles and their safety-critical systems, requiring a CSMS and risk management aligned with ISO/SAE 21434. CRA applies to individual digital products, components, and aftermarket items, including those integrated into vehicles but not covered by type approval regulations. CRA is a horizontal regulation, meaning it applies across industries, ensuring a baseline cybersecurity standard for all digital products.

Therefore, even if a vehicle manufacturer complies with UNR155, **component suppliers** and aftermarket product makers must also comply with CRA if their products fall within its scope.

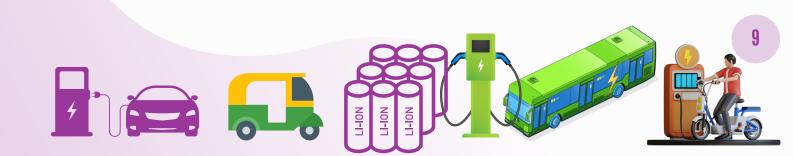
Impact on Vehicle and Component Manufacturers

Vehicle Manufacturers (OEMs) must comply with UNR155 by implementing a CSMS and conducting cybersecurity risk assessments for their vehicles. They need to ensure that suppliers provide cybersecurity evidence for components to maintain compliance and may be indirectly affected by CRA through supply chain requirements, as suppliers must meet CRA obligations for their digital products.

Component Manufacturers and Suppliers face direct CRA obligations for digital products not covered by UNR155, and aftermarket devices (such as telematics units, infotainment systems). They must implement cybersecurity by design and maintain security throughout the product lifecycle, provide documentation and evidence of cybersecurity resilience to OEMs and regulatory bodies, and risk fines and market bans if CRA compliance is not met, affecting their ability to supply to vehicle manufacturers.

Practical Example:

A company producing an aftermarket telematics dongle with internet connectivity will not fall under UNR155's vehicle type approval but must comply with CRA. This means designing the dongle with cybersecurity controls, providing vulnerability management and update mechanisms, documenting cybersecurity measures for market approval, and collaborating with OEMs for integration without introducing new risks. Meanwhile, the OEM ensures that the vehicle's core systems comply with UNR155, including secure communication with such aftermarket devices.



Automotive Cybersecurity Risk Management Solutions



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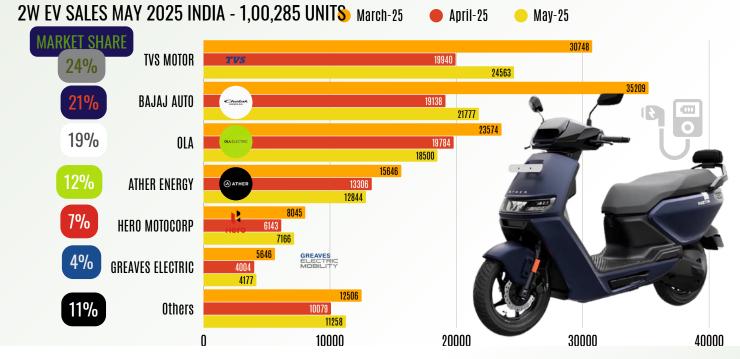




India EV 2W Sales May 2025

TOP EV-2W Sales by OEM





India's E2W market continues to surge, clocking **1,00,285 units** sold in May 2025 — a solid 30% YoY growth!

The Rizta, Ather Energy's electric scooter, has surpassed wholesale of 100,000 units in the domestic market.



Electric Two-Wheeler (E2W) Sales Surge in **May 2025**

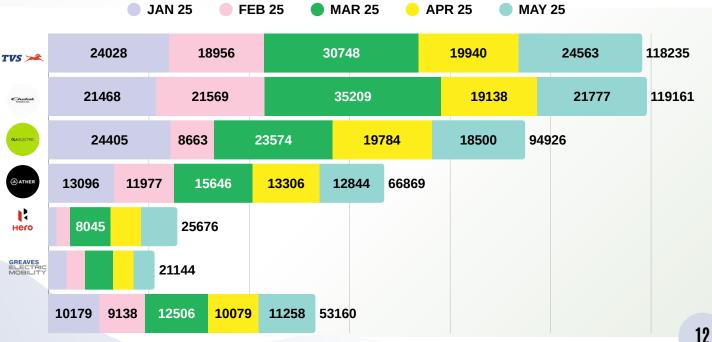


India's E2W Market Accelerates with Double-Digit Growth, TVS and Bajaj Lead the Charge

India's electric two-wheeler (E2W) segment continued its robust growth trajectory in May 2025, with leading manufacturers reporting impressive year-on-year gains and the overall market expanding by 30% compared to the previous year. Here's a detailed look at the latest figures, trends, and insights shaping the E2W landscape.

May 2025: Brand-wise Performance and Growth

- TVS Motor: Sold 24,563 units in May, marking a 107% year-on-year increase. The brand also saw a strong 23.18% sales jump compared to April 2025, highlighting its growing dominance in the segment.
- Bajaj Auto: With 21,777 units sold, Bajaj Auto posted a remarkable 135% YoY growth and a 13.79% rise over April sales.
- Ola Electric: Sold 18,500 units, which, despite being a significant volume, represented a 51% decline YoY and a 6.49% decrease from April, signaling challenges in sustaining its earlier momentum.
- Ather Energy: Registered 12,844 units, up by 109% year-on-year, though slightly down by 3.47% from April.
- Hero MotoCorp: Achieved 7,166 units, a staggering 191% YoY surge and a 16.65% increase over April, reflecting renewed market interest.
- Greaves Electric: Sold 4,177 units, up 4.32% over April.
- Others: Combined sales of 11,258 units, showing a healthy 11.7% month-on-month increase.



Cumulative Sales: January-May 2025

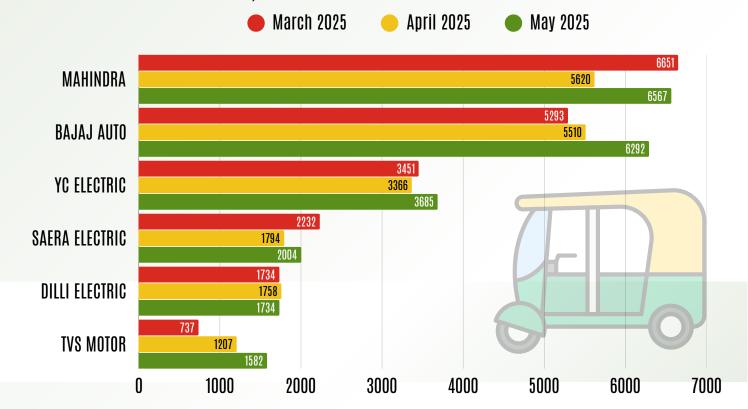
The total E2W sales for the first five months of 2025 reached an impressive 499,171 units, underscoring the sector's rapid expansion and growing acceptance among Indian consumers.

India EV 3W Sales May 2025



TOP EV 3W Sales Trend by OEM

EV 3W SALES MAY 2025 INDIA -66,017 UNITS



Mahindra and Bajaj Lock Horns for E-3W Leadership in May 2025 as TVS Makes a Mark May 2025: Second-Best Month Ever for E-3W Industry

The electric three-wheeler segment recorded **66,017 units** sold in May 2025, a robust 21% year-on-year growth and just 1,162 units shy of the all-time high set in October 2024. This surge underscores the growing acceptance of e-3Ws, driven by evolving consumer preferences and the expanding footprint of established OEMs.

Market Leaders: Mahindra vs. Bajaj

- Mahindra Last Mile Mobility Ltd led the market with 6,567 units sold in May, capturing 30.04% of the market share.
- Bajaj Auto Ltd followed closely, retailing 6,292 units and securing a 28.78% share.
- The gap between Mahindra and Bajaj narrowed to just 275 units, intensifying the rivalry for the top spot.

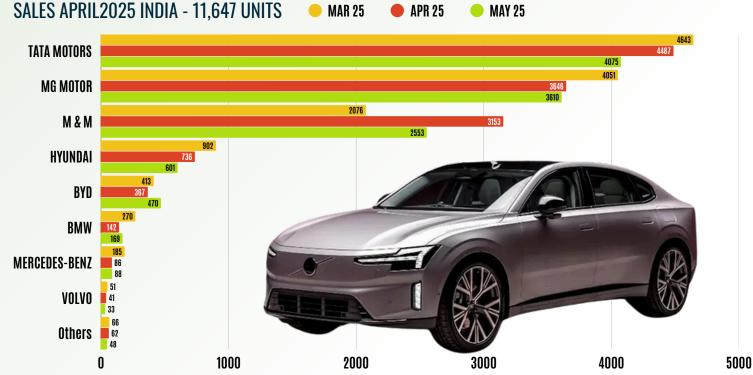
Monthly Growth Trends: Who's Accelerating?

- Mahindra bounced back from a dip in April with a 16.85% growth in May.
- Bajaj maintained steady momentum, growing by 14.19% from April to May.
- TVS has shown the most aggressive expansion, with sales rising 31% month-on-month, reflecting strong market acceptance and effective channel ramp-up.
- YC Electric Vehicle and Saera Electric Auto also posted healthy growth rates of 9.48% and 11.71%, respectively.
- Dilli Electric Auto saw a slight decline, indicating increasing competitive pressure.

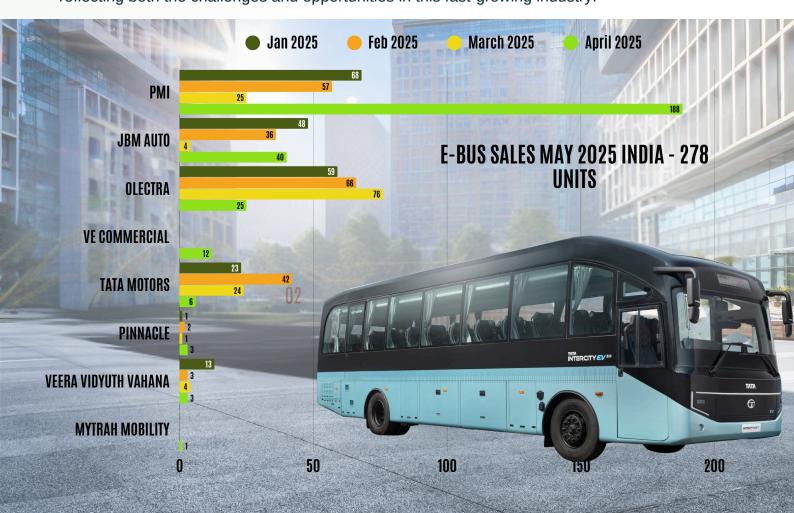
India EV Sales May 2025

EV 4W Passenger Sales Trend by OEM





India's electric vehicle (EV) sector continues to evolve rapidly, with the four-wheeler light motor vehicle segment witnessing dynamic shifts in sales and market leadership. As we analyze the sales data from January to May 2025, several trends and standout performances emerge, reflecting both the challenges and opportunities in this fast-growing industry.



EV 4W Light Motor Vehicle Sales in May 2025



A Deep Dive into India's Electric Four-Wheeler Market Performance from January to May 2025

Key Highlights: May 2025 Sales Snapshot

- Tata Motors and JSW MG Motor India remain the front-runners by volume, though both saw a decline in sales compared to January.
- Mahindra & Mahindra delivered an exceptional surge in growth, outpacing all other major players in terms of percentage increase over the five months.
- **Hyundai and BYD India** posted robust growth, while luxury brands like BMW, Mercedes-Benz, and Volvo maintained steady but modest numbers.

Company	JAN 25	FEB 25	March 25	APRIL 25	May 25	TOTAL
Tata Motors	4,810	3,461	4,588	4,208	4075	21492
MG Motor	4,394	3,416	3,989	3,404	3610	19130
M & M	522	457	2,035	2,930	2553	8768

Market Insights

1. Tata Motors and JSW MG Motor: Market Leaders Facing Headwinds

Despite leading in absolute sales, both Tata Motors and JSW MG Motor India experienced negative overall growth from January to May, with sales declining by 15.33% and 17.84% respectively. Their numbers peaked in March before trending downward, indicating possible market saturation, increased competition, or short-term supply chain issues.

2. Mahindra & Mahindra: The Breakout Performer

Mahindra & Mahindra recorded a phenomenal 384.44% growth over the five-month period. The company's sales skyrocketed from 527 units in January to 2,553 in May, driven by successful new model launches and aggressive marketing. Even after a slight dip in May, Mahindra's momentum signals a strong market response to its EV offerings.

3. Hyundai and BYD: Consistent Climbers

Hyundai Motor India and BYD India both achieved significant gains, with overall growth of 81.57% and 44.62% respectively. Hyundai's sales more than doubled from January to February, while BYD posted a notable 28.07% jump from April to May, reflecting growing consumer interest in their EV portfolios.

4. Luxury Segment: Stable but Niche

Premium brands like BMW, Mercedes-Benz, and Volvo continue to operate in a niche segment, with stable but low volumes. These brands are likely focusing on brand-building and early adopter markets, setting the stage for future expansion as infrastructure and demand mature.

5. Volatility and Seasonal Trends

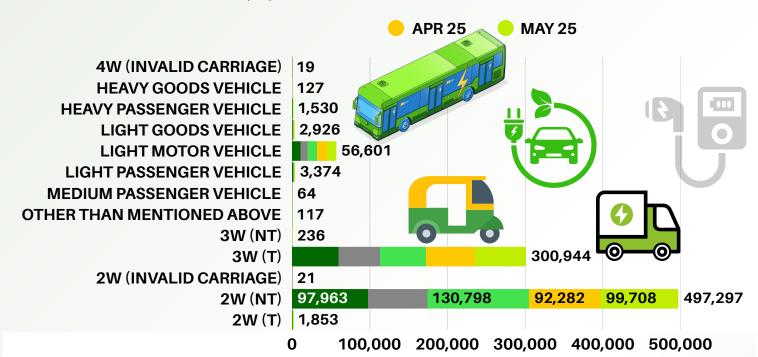
The data reveals significant month-to-month volatility, especially among the top players. March saw a broad uptick in sales across most brands, possibly due to fiscal year-end incentives or new launches, followed by corrections in subsequent months.

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India EV Sales Jan - May 2025 -Category-Wise



EV SALES MAY 2025 INDIA - 1,79,556 UN SJAN 25 FEB 25 March 25



The Indian electric vehicle (EV) sector continues its impressive growth trajectory in 2025, with sales figures from January to May revealing robust consumer interest and evolving market dynamics. As the nation pushes towards cleaner mobility, let's break down the latest trends, highlight top-performing segments, and spotlight the leading manufacturers driving this electrifying revolution.

Segment-Wise Performance: Two-Wheelers Lead the Charge

Two-Wheelers: The Undisputed Champions

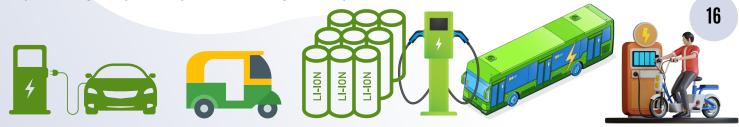
- **TWO WHEELER (NT)**: With a staggering 497,297 units sold, non-transport two-wheelers dominate the market, accounting for more than half of all EV sales. This segment's affordability, urban utility, and improved battery tech have made it the go-to choice for daily commuters.
- TWO WHEELER (T): Transport two-wheelers also saw consistent sales, totaling 1,853 units.

Three-Wheelers: The Backbone of Urban Mobility

- THREE WHEELER (T): With 300,944 units sold, electric auto-rickshaws and cargo vehicles are transforming last-mile connectivity and urban logistics.
- THREE WHEELER (NT): Niche but growing, with 236 units sold.

Four-Wheelers and Commercial Vehicles: Steady Growth

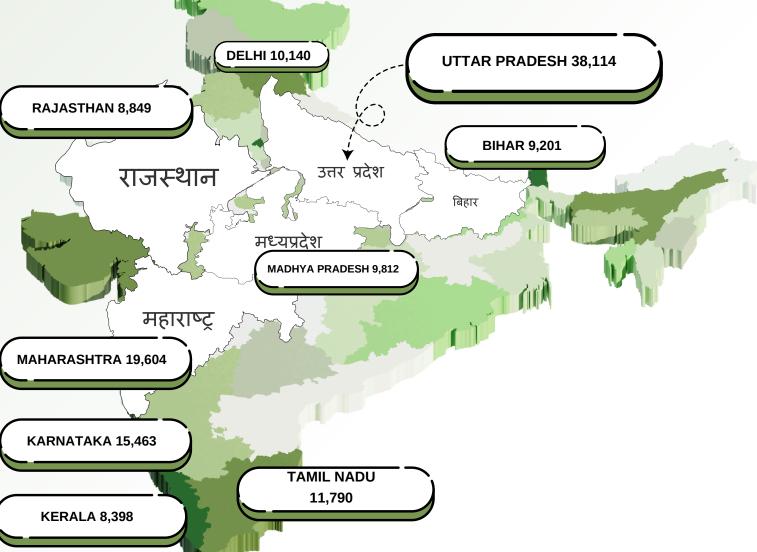
- **Light Motor Vehicles (LMVs)**: 56,601 units sold, reflecting growing interest in electric cars and vans for both personal and commercial use.
- Light Goods Vehicles (LGVs): 2,926 units sold, showing EVs' increasing role in logistics.
- Heavy Goods & Passenger Vehicles: Combined sales of 1,657 units indicate early but promising adoption in public and freight transport.



State Wise EV Sales in Jan - May 2025



EV SALES MAY 2025 INDIA - 1,79,556 UNITS



India's Electric Vehicle Surge: State-wise EV Sales Analysis (Jan-May 2025)

India's electric vehicle (EV) revolution is in full swing, with the first five months of 2025 showcasing robust growth and dynamic shifts across states. As EV adoption gains momentum, state-wise sales data from January to May 2025 reveals fascinating trends, market leaders, and the evolving landscape of sustainable mobility in the country.

EV Sales Snapshot: Jan-May 2025

From January to May 2025, India recorded a whopping 865,109 EV sales across all states and union territories. This figure underscores the nation's accelerating commitment to clean mobility and the growing consumer confidence in electric vehicles.

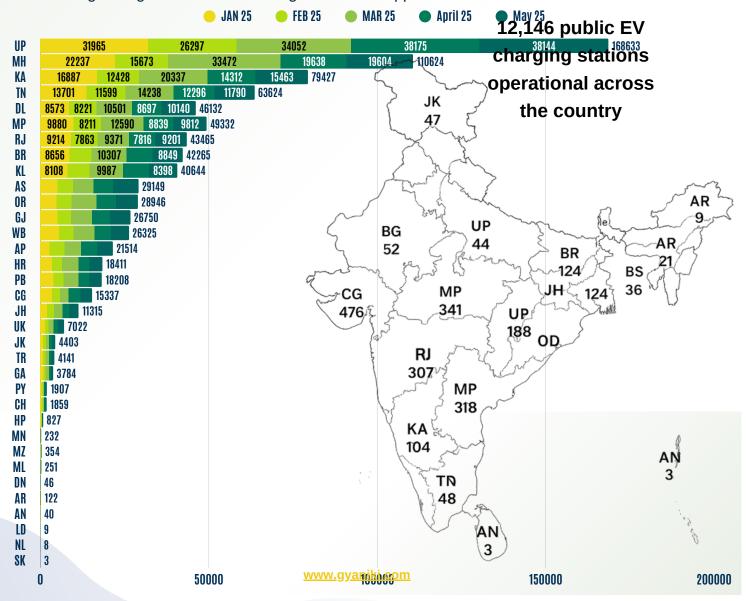


State Wise EV Sales in Jan to May 2025



Top Performing States

- **Uttar Pradesh**: With a staggering **168,633 units** sold, UP is the undisputed leader, accounting for nearly 20% of total national EV sales. The state's proactive policies, expanding charging infrastructure, and increasing urbanization have fueled this remarkable growth.
- Maharashtra: Securing the second spot, Maharashtra tallied 110,624 EV sales. Mumbai, Pune, and Nagpur have emerged as key EV hubs, supported by state incentives and a tech-savvy population.
- Karnataka: With **79,427** units, Karnataka continues to be a stronghold for EV adoption, driven by Bengaluru's tech ecosystem and a robust network of startups and manufacturers.
- Tamil Nadu and Delhi round out the top five, with 63,624 and 46,132 sales respectively, reflecting strong urban demand and government support.



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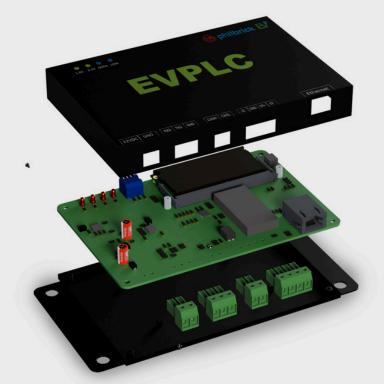
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Horse Powertrain's Bold Move: Converting EV Platforms to Hybrids

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As the global automotive landscape shifts, most manufacturers are racing to deliver fully electric vehicles (EVs). Yet, at **Auto Shanghai 2025**, Horse Powertrain—a Renault-Geely joint venture—unveiled a disruptive solution: the Future Hybrid Concept. This innovative system is designed to convert existing EV platforms into hybrids, offering automakers and consumers a flexible, pragmatic path forward.

Revolutionizing Hybridization: Key Features of the Future Hybrid Concept

- Integrated Hybrid System: At the heart of the Future Hybrid Concept is a 4-cylinder engine acting as
 a range extender, paired with two electric motors—one for propulsion and another for electricity
 generation and engine cranking. This configuration ensures seamless power delivery and improved
 driving versatility.
- **Complete Powertrain Package**: The system includes all essential components, such as an inverter-converter, motor controller, and more, making it a true plug-and-play solution for automakers.
- Fuel Flexibility: The engine can be tuned to operate on gasoline, ethanol, methanol, flex fuel, and even synthetic fuels—addressing regional fuel availability and sustainability goals.
- 800V Charge Booster: An optional charge booster for 800V systems is available, enhancing charging
 efficiency and future-proofing the platform.
- Minimal Modifications Required: The modular design allows the system to bolt onto existing EV
 platforms, enabling automakers to hybridize battery electric vehicles (BEVs) without significant redesign
 or production line changes.

Why This Matters: Addressing Industry Challenges

- EV Sales Slowdown and Hybrid Momentum: Global EV adoption faces hurdles such as limited charging infrastructure and persistent range anxiety, which continue to slow growth. Hybrid sales, on the other hand, are accelerating as consumers seek practical, fuel-efficient alternatives that don't rely solely on charging networks.
- **OEM Flexibility and Cost Efficiency**: Horse Powertrain's solution empowers automakers to produce EVs and hybrids on the same assembly line. This reduces manufacturing complexity and cost, allowing companies to adapt quickly to shifting market demands.
- Technology-Neutral Approach: Rather than betting exclusively on BEVs,
 Horse Powertrain offers a diversified solution, enabling automakers to
 meet varying regulatory, infrastructural, and consumer requirements across global markets.
 Industry Impact & Future Outlook
 - Market-Ready by 2028: The first vehicles equipped with the Future Hybrid Concept could hit the roads as early as 2028, setting a new standard for adaptable, sustainable mobility.
 - **Global Scale and Expertise**: With 17 production plants and 5 R&D centers across three continents, Horse Powertrain is well-positioned to become a leading supplier for global automakers, leveraging its extensive heritage from Renault and Geely.
- Strong Industry Backing: The recent acquisition of a 10% stake in Horse Powertrain by Aramco, based on a €7.4 billion valuation, underscores strong industry confidence in hybrid solutions and the critical role they will play in the energy transition. This partnership will also accelerate research in synthetic fuels and low-carbon mobility.

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Top Money Movement



Mobec Innovation

Mobec Innovation, a provider of mobile electric vehicle (EV) charging solutions and energy storage systems, has announced a strategic shift towards lithium battery recycling by adopting a partnership-based expansion model. This move is intended to address the growing volume of battery waste generated by electric vehicles, solar energy systems, and other sectors, while contributing to India's Net Zero targets.



Uno Minda



Uno Minda Limited has announced plans to establish a greenfield manufacturing facility for high-voltage electric powertrain components used in four-wheeler passenger and commercial vehicles. The board-approved investment aims to strengthen the company's capabilities in the electric mobility space, with an estimated project cost of **INR 423 crore**. The plant will initially be developed under Uno Minda Auto Innovations Private Limited, a wholly-owned subsidiary, and later converted into a joint venture with China-based Suzhou Inovance Automotive, subject to regulatory clearance. Uno Minda is expected to hold a 70 percent stake in the joint venture.

Cygni Energy

Cygni Energy has inaugurated the first phase of its Battery Energy Storage System (BESS) gigafactory at the Electronics Manufacturing Cluster in Maheshwaram, Hyderabad. The facility, spanning **160,000 sq. ft. on a 5-acre campus**, is equipped with advanced automation and has an initial production capacity of **4.8 GWh** for high-capacity battery packs catering to electric vehicles and grid-scale storage systems.



Himadri Horset Specially Christal Ed. SICUNA Battery Technologies

Himadri Speciality Chemical Ltd.

Himadri Speciality Chemical Ltd is in talks to buy a 10-12 per cent stake in International Battery Company (IBC), a US-based lithium-ion battery cell technology firm. The potential deal, estimated at **\$10-12 million**, is expected to be announced later this month. The strategic investment would help Himadri enter new markets and strengthen its position in the new energy ecosystem.







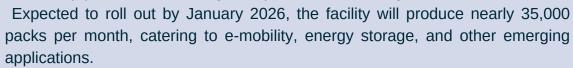


Top Money Movement



Endurance Technologies Ltd.

Endurance Technologies Ltd. is powering ahead in the hashtag#EV ecosystem with a major investment of **INR 47.3 crores** to set up a state-of-the-art lithiumion battery pack manufacturing facility at Maval, hashtag#Pune.







Folks Motor

Folks Motor, a leading player in India's xEV (retrofit) industry, has secured ₹100 crore in the first close of its newly launched "Folks Funds," an Alternative Investment Fund (AIF) Category II with a target corpus of ₹500 crore. The company expects to reach the full funding target by the end of 2025, with investments focused on strengthening India's electric vehicle supply chain and enhancing local manufacturing capabilities.

Euler Motors

Euler Motors has successfully raised ₹638 Cr in its Series D round, led by Hero MotoCorp and British International Investment (BII).

In March 2025, Hero MotoCorp committed an investment of ₹525 Cr, securing a 32.5% stake in Euler Motors.

With this round, the total funding raised by the EV startup now stands at a massive $\mathbf{₹1,420}$ Cr.





Zenergize

Gurgaon-based Zenergize, a cutting-edge power electronics company, has secured \$2 million in seed funding led by Mohit Tandon (Co-Founder, Delhivery) and Himanshu Aggarwal (Founder, Aspiring Minds).

Specializing in EV chargers and solar inverters built using Silicon Carbide (SiC)-based indigenous technology, Zenergize is creating solutions designed specifically for Indian conditions — a major leap for the domestic EV ecosystem.

Kinetic Engineering Limited (KEL)

Kinetic Engineering Limited (KEL) has granted a brand licence to its subsidiary, Kinetic Watts and Volts Ltd (KWV). This marks the brand's entry into the electric vehicle market. KWV is preparing to unveil its product portfolio, rollout strategy, and partnerships. KEL and other promoters have so far injected **Rs 42.83 crore** in KWV, and another Rs 29 crore is to be released, which will give an 80 per cent ownership stake in the company.



Top Money Movement



MAHLE

MAHLE, a global leader in automotive technology, has taken a major leap in the e-mobility sector with a €200 million order to supply cutting-edge DC/DC converters for battery-electric vehicles (BEVs) in China.





IPEC India

IPEC India, a homegrown EV charging solutions provider, has raised USD 3 million in funding from Gruhas, the investment platform co-founded by Nikhil Kamath and Abhijeet Pai.

IPEC India has been a silent powerhouse since 2017, founded as a joint venture between MEHER GROUP, Deki Electronics Ltd, and Sungho Electronics Corp.. With over 10 lakh EV chargers already delivered to India's top EV OEMs, the company is now gearing up to scale up manufacturing to 50,000 units per month!

Volt14 Solutions

Volt14 Solutions has successfully **raised** \$1.87M in a Pre-Series A round led by Blume Ventures, with strong backing from Beyond NEXT VENTŪRES., Spectrum Impact, Supermorpheus, and Cocoon Capital – taking their total funding to \$4.02M!



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FUTURE MOBILITY PARTNERS













gyaniki Insights



Which EV Truly Offers the Best Value in India? 🗲

Thinking about switching to an electric car but unsure which one is worth your investment? We've got you covered.

In this month's feature, we take a deep dive into India's top EVs of 2025, comparing everything that matters:

- Real-world battery performance vs. claimed range
- Fast charging capabilities across cities
- Ownership cost—including service, charging, and resale
- Safety ratings, build quality & reliability insights

From the affordable and practical Citroën ë-C3 to the premium and feature-loaded Hyundai Ioniq 5, our analysis breaks down what each EV delivers—and where it falls short.

Plus, we've also added a section on India's rapidly expanding public charging infrastructure and what it means for your daily drives.

Read the full article and make an informed EV choice today!



Silicon Carbide (SiC) vs Gallium Nitride (GaN): Who's Powering the Future of EVs?

As EVs demand faster, smaller, and more efficient electronics, wide bandgap semiconductors are taking center stage.

From performance to packaging, SiC and GaN each bring game-changing advantages to the table.

Explore how they stack up in cost, efficiency, voltage handling, and real-world EV applications.

Read the full article now and unlock the future of EV power systems!



Endurance Technologies

Endurance Technologies Ltd., a leading auto components maker, is foraying into the lithium-ion battery space. The company is setting up a new facility in Pune, Maharashtra.

The new facility will be utilized for manufacturing lithium-ion battery packs, a move in an effort to tap the fast-expanding electric mobility and energy storage space. The total project investment is likely to be ₹47.3 crore. The firm said it would self-finance the whole of this expansion from internal resources, a clear sign of prudent financial management.





SWITCH Mobility

SWITCH Mobility has delivered 100 electric vehicles to the Indore Municipal Corporation for waste management operations. The SWITCH IeV3 vehicles, designed specifically for waste collection, will replace conventional diesel vehicles currently in use.

Real-Time Innovations (RTI)

(RTI), the software framework company for physical AI systems, today announced Connext® AI: a suite of LLM-powered tools designed to build robust, scalable real-time systems. By integrating AI with the Connext software customers know and trust, RTI is setting the standard for advancing the future of physical AI system development. Connext AI adds intelligent assistance to tools for design, coding, and debugging. Connext AI accelerates time to market, streamlines workflows,

and enhances system reliability like never before.

Uniquely, this AI platform is built on decades of RTI experience including thousands of pages documentation, code repositories, numerous use cases, and data models with over 3,000 types. Connext AI is custom-designed read User Manuals. to API documentation, code examples, and much more to provide the best possible information via today's top LLM.













EVRE

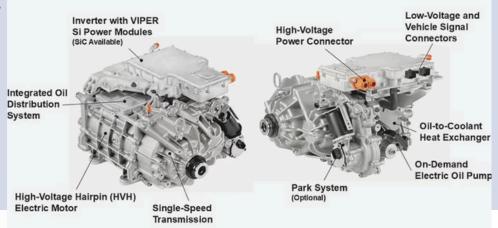
EVRE, a prominent electric vehicle (EV) charging infrastructure player, has inaugurated a new manufacturing facility in Hyderabad. The plant is a significant step forward in expanding the company's production capacity and is intended to cater to domestic and export markets. The new facility can produce up to 100,000 EV chargers per year.



BorgWarner

BorgWarner has unveiled a major expansion to its electric drive motor portfolio, focusing on high-efficiency, scalable technologies that cater to the growing demand for next-generation electric and hybrid mobility. These new developments aim to increase power density, boost efficiency, and offer greater flexibility across various vehicle types—from compact EVs to high-performance

luxury models.



Delhi Electric Vehicle Interconnector (DEVi)

Delhi has introduced the Delhi Electric Vehicle Interconnector (DEVi) initiative, deploying a fleet of advanced electric buses to improve last-mile connectivity between metro stations and major bus terminals. The initiative, flagged off by Chief Minister Smt. Rekha Gupta, aligns with the vision of Hon'ble Prime Minister Shri Narendra Modi to enhance urban mobility through sustainable transportation solutions.

400 DEVi buses have been deployed in East and West Delhi, covering areas such as Ghazipur, Vinod Nagar East, and Nangloi. Each bus features 23 seats, including six reserved exclusively for women, and space for 13 standing passengers. The fare structure ranges between ₹10 and ₹25, while women commuters can travel free of cost. The buses will operate at 10-minute intervals, ensuring frequent and reliable service for urban travelers.











Ultraviolette Automotive

Bengaluru-based electric vehicle company Ultraviolette Automotive collaborated with the Madras Regiment Centre (MRC) of the Indian Army for a five-day rally across Tamil Nadu, by providing a fleet of F77 motorcycles.

The ride honoured the army Veterans and Veer Naris of Madras Regiment and



The ride honoured the army Veterans and Veer Naris of Madras Regiment and the Armed Forces community in the region.

BorgWarner

BorgWarner, a global product leader in delivering innovative and sustainable mobility solutions, has secured a contract with a major, global OEM to deliver its 400-volt HVCH on a series of the automaker's plug-in hybrid electric vehicle (PHEV) platforms. This HVCH PHEV deal spans mid-size pickup trucks, SUVs and minivans, and production is expected to begin production in 2027. The deal marks BorgWarner's largest HVCH PHEV award in North America to date based on expected volumes.

Key Features:

- 400V high-voltage coolant heater (HVCH) technology to be used in series of plug-in hybrid electric vehicles
- HVCH offers flexible and compact design with high thermal power density
- Marks the company's largest eHeater contract for plug-in hybrid electric vehicles in North America

EKA Mobility

EKA Mobility has officially received the Automotive Production Linked Incentive (PLI) Certificate under the Advanced Automotive Technology (AAT) Vehicles category from the Automotive Research Association of India (ARAI).









Pionix GmbH

Pionix GmbH unveiled ChargeBridge — a modular, pre-certified hardware solution that's redefining how EV charging controllers are developed.

With the rise of electric mobility, **ChargeBridge** brings a game-changing approach by decoupling safety-critical hardware from software logic. This enables manufacturers to focus on innovation, speed up product development, and meet international safety standards with ease.

Key Highlights:

- · Plug-and-play with Linux via USB or Ethernet
- Supports AC, DC & bidirectional charging
- Includes BaseCamp software with lifelong updates
- Certified to reduce compliance hassles
- Designed for speed, flexibility &

future-ready development



EVDANCE

EVDANCE, a leading innovator in electric vehicle (EV) charging solutions, has announced the launch of its latest product, the FLUX 40A Smart EV Charger. This new charger is designed to revolutionize home charging with its advanced features and intelligent technology, catering to the growing demand for efficient and user-friendly EV solutions.

Key Highlights

- Fast Charging: Delivers 40A and 9.6 kW, providing 25-30 miles of range per hour.
- Intelligent App Integration: Offers remote control, scheduling, and real-time monitoring.
- Safety and Durability: CE/FCC certified with an IP66 rating for all-weather use.
- Portability and Versatility: Features a compact design with a 25-foot cable.











Foxconn

The Union Cabinet has officially approved the HCL-Foxconn Semiconductor Plant in ewar, Uttar Pradesh – a massive leap forward for India's chipmaking ecosystem!

Here's why this is a landmark moment:

- Uttar Pradesh's FIRST semiconductor facility
- India's SIXTH semiconductor plant
- ◆ ₹3,700 crore investment in cutting-edge tech
- Capacity to produce 20,000 wafers monthly
- Over 2,000 job opportunities for skilled professionals
- This approval strengthens India's self-reliance in semiconductors the heartbeat of electric vehicles, connected mobility, and next-gen tech.

Mercedes-Benz Trucks Mercedes-Benz Trucks UK is set to redefine electric freight transport by introducing new variants based on the eActros 600, with orders opening in Autumn 2025. These additions are designed to meet a wide range of operational needs from payload 100% ELECTRIC optimization to What's New? extended range — Semitrailer tractors & platform supporting chassis with more wheelbase the industry's broader options decarbonization goals. ✓ Flexible battery packs for either longer range or higher payload Advanced LFP battery tech & electric drive axle ✓ New long cab designs with THE NEW eACTROS 600 customizable roof shapes Seamless digital control with the Multimedia Cockpit Interactive 2 GER®ZE 600











Omega Seiki Mobility

Omega Seiki Mobility (OSM), a company focused on sustainable transportation solutions, has partnered with **Naari Shakti Women Welfare Charitable Trust** to provide 2,500 electric Pink Auto Rickshaws to women drivers across India. The initiative is part of OSM's Corporate Social Responsibility (CSR) programme and is intended to support women's participation in the mobility sector.







Fiat - Hybrid Mobility

FIAT has officially assembled its first pre-production units of the all-new FIAT 500 Hybrid at the iconic Mirafiori plant in Turin, marking a bold leap in its sustainable mobility journey.

Full-scale production is expected to launch by November, aiming for over 100,000 units annually.



SK On

SK On Unveils Solid-State Battery Breakthroughs

In a major stride towards the future of energy storage, SK On has unveiled breakthroughs in all-solid-state lithium metal batteries (ASSLMBs)—a move that could reshape the EV industry.

Collaborating with top academic minds from Hanyang University and Yonsei University, SK On.











MAHLE

Mahindra & Mahindra Ltd. has presented the "Special Appreciation Award" to MAHLE for its cutting-edge Intelligent Thermal Management System (ITMS)—developed specifically for M&M's first electric vehicle platforms: XUV.e9 and BE.6.



This intelligent system:

- Optimizes cabin and battery temperature
- ✓ Reduces electric compressor power usage by 15–20%
- Enhances comfort without compromising efficiency





EKA Mobility

EKA Mobility has received a Letter of Award (LOA) for supplying and deploying 750 electric buses across 11 cities in Andhra Pradesh. The project will be executed in collaboration with GreenCell Mobility, a company engaged in providing electric mobility solutions in India. and EKA Mobility, an electric vehicle and technology company, in collaboration with Chartered Speed, has secured a Letter of Award (LOA) for the deployment of 675 electric buses in Rajasthan under the Pradhan Mantri e-Bus Sewa Scheme.



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FUTURE MOBILITY BATTERY & CHARGER

CATL Unveils Next-Gen Battery Tech



500km Range, Ultra-Fast Charging, and Mass-Produced Sodium-Ion Breakthrough

As the global race for electric vehicle (EV) supremacy intensifies, Chinese battery giant **Contemporary Amperex Technology Co. Limited (CATL)** has once again raised the bar. At its "**Tech Day**" event on April 21, 2025, CATL introduced three revolutionary battery technologies that promise to reshape the competitive landscape between pure electric and hybrid vehicles, while addressing long-standing industry pain points.

Freevoy Dual Power Battery: A 1500km Leap Forward

The headline innovation is the Freevoy Dual Power
Battery, a dual-core architecture that delivers a
staggering range of over 1500 kilometers (932 miles)
on a single charge. This "battery within a battery"
Concept cleverly blends multiple chemistries—
Including lithium-ion, sodium-ion, and Nickel-Cobalt-Manga
(NCM)—to optimize performance across a variety of
Driving scenarios and climates.



- How it works: The Freevoy system divides energy storage into two independent zones: one for daily
 needs and another for long-distance travel. This approach not only solves the range anxiety associated
 with EVs but also enhances reliability for autonomous vehicles and adapts to extreme temperatures by
 leveraging sodium-ion cells when lithium-ion efficiency drops.
- Technical edge: The battery features a self-forming anode technology, boosting volumetric energy density by 60%. This means more energy is packed into a smaller space, improving both range and efficiency36.

Shenxing Superfast Charging Battery: 520km in 5 Minutes

CATL's second-generation Shenxing Superfast Charging Battery sets a new global benchmark for rapid charging. With the ability to add 520 kilometers of range in just five minutes, this technology nearly matches the refueling speed of internal combustion engine vehicles and far outpaces Western competitors—**Tesla's Superchargers**, for example, provide about 270 km in 15 minutes.

- **Real-world impact**: This breakthrough directly tackles consumer concerns about charging downtime, making EVs far more practical for long-distance travel and daily use.
- All-weather performance: The battery maintains strong charging speeds even in low temperatures, down to -10°C, outperforming many current industry offerings.

Naxtra Sodium-Ion Battery: Mass Production by 2025

The third major announcement is the Naxtra Battery, the world's first mass-producible sodium-ion EV battery, slated for full-scale production by the end of 2025. Sodium-ion technology offers several compelling advantages:

- **Resource sustainability**: Sodium is far more abundant and affordable than lithium, cobalt, or nickel, reducing both costs and environmental impact.
- Cold-weather resilience: These batteries excel in low temperatures, maintaining stable performance down to -20°C, and can charge to 80% in just 15 minutes under normal conditions.

Performance: With an energy density of up to 175 will kg, Naxira batteries are closing the gap with curre lithium iron phosphate (LFP) cells, offering up to 500 km range and over 10,000 cycles for passenger vehicles.

Joint Ventures & Partnerships



KPIT - Mercedes-Benz Research and Development India (MBRDI)

KPIT Technologies, has announced a collaboration with Mercedes-Benz Research and Development India (MBRDI) to accelerate the development and realization of Software-Defined Vehicles (SDVs). This collaboration is poised to enhance innovation, speed up product feature launches, and deliver cost advantages by leveraging KPIT's cross-domain expertise in mobility technologies.





JBM Electric - Hitachi ZeroCarbon

JBM Electric Vehicles has partnered with Hitachi ZeroCarbon to integrate advanced battery management technology into its electric bus fleet

The collaboration will deploy Hitachi's ZeroCarbon BatteryManager system in JBM's electric buses to collect real-time data and provide actionable insights on charging patterns, route optimization, and asset usage. The partnership specifically targets performance improvements in varying climate conditions across India and the Middle East.

Kazam - Yuma Energy

Kazam, a leading EV charging infrastructure provider, has joined forces with Yuma Energy to introduce battery-swapping at its Park & Charge hubs across India. The rollout has begun at the Mahadevapura facility in Bangalore, with plans for nationwide expansion.





Mahindra has partnered with German engineering leader FEV to co-develop an advanced hashtag#LFPBattery system for its upcoming Electric Origin SUV lineup.



This new high-density battery system was 2 years in the making and boasts:

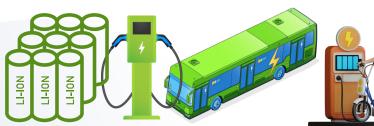
- ▼ Two variants 59 kWh & 79 kWh
- ✓ Fast-charging: 20-80% in just 20 minutes
- ✓ Proven safety passed fuel fire, nail penetration, and rollover tests
- ✓ Validated at FEV's eDLP, the world's largest HV battery test center

It's designed to meet rigorous global standards including IEC, ISO, UL, SAE, and AIS, with a strong focus on Indian regulatory needs.

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Joint Ventures & Partnerships



e-Sprinto - Hala Mobility

e-Sprinto and Hala Mobility — a partnership geared towards revolutionizing sustainable urban transportation.

This collaboration marks a significant step forward in our shared vision of accelerating electric mobility across India. By joining forces, e-Sprinto's cutting-edge electric scooters will now power Hala Mobility's expanding fleet, providing cleaner, smarter, and more accessible last-mile solutions for daily commuters.



Lucid - KAUST



Lucid Group, Inc., maker of the world's most advanced electric vehicles, and King Abdullah University of Science and Technology (KAUST), a leading academic and research institution focused on science and technology innovation with regional and global impact, today announced a strategic partnership designed to shape the future of EV technology. Leveraging the growing resources in the Kingdom of Saudi Arabia, Lucid aims to further advance the company's technology leadership.

Sterling Tools Limited - Advanced Electric Machines (AEM)

Sterling Tools Limited has signed a technology licensing agreement with UK-based Advanced Electric Machines (AEM) to manufacture rare earth magnet-free traction motors for electric vehicles in India.

The agreement aims to offer an alternative to the China-dependent permanent magnet supply chain while delivering motors with competitive performance characteristics. Sterling Tools plans to serve all segments of India's traction motors market, which is projected to reach approximately Rs 15,000 crore by 2030.



Zest - Allstar



Zest, a key player in public EV charging infrastructure, joins forces with Allstar, one of the UK's leading fleet payment solution providers, to supercharge electric mobility for business fleets across the country.

This strategic partnership brings over 1,300 Zest EV charging locations under the Allstar Co-Pilot app, streamlining access and simplifying payments for fleet drivers.









Joint Ventures & Partnerships



Schroders Capital - Be.EV

Schroders Capital joins hands with Be.EV to roll out 200+ ultra-rapid EV charging bays across 22 prime retail and leisure destinations in the UK. This strategic move supports the UK's green energy transition while boosting footfall for brands like IKEA, Costa Coffee, Marks and Spencer, McDonald's's, and more.





Symbio - Savage

Symbio and Savage have unveiled a game-changing hashtag#HydrogenTruck prototype built on a Mack Trucks Anthem chassis, designed specifically for short-haul work.

Featuring Symbio's modular 300 kW fuel cell system and FORVIA's high-pressure XL hydrogen tanks, this truck delivers a full day of operation on 34 kg of hydrogen at 700 bar – and refuels in under 15 minutes!

Rilox EV - Hala Mobility

Rilox EV and Hala Mobility have just inked a multi-year OEM partnership set to electrify India's two-wheeler market—literally!

Starting with 400 electric two-wheelers each month, this collaboration aims to roll out nearly 20,000 EVs nationwide, beginning with low-speed models and scaling up to high-speed, fleet-optimized vehicles.



Rilox's Spark Elite, a smart electric solution tailored for gig workers, daily riders, and fleet managers.

Zeon Corporation - Sino Applied Technology Co., Ltd (SiAT)

Zeon Corporation has joined hands with Sino Applied Technology Co., Ltd (SiAT) in a game-changing partnership to boost the future of lithium-ion batteries and power the next wave of Electric Vehicles.













Joint Ventures & Partnerships



Adani ATEL

Adani TotalEnergies E-Mobility (ATEL), a subsidiary of Adani Total Gas, has committed over Rs 100 crore to build 3,400 electric vehicle (EV) charging points across India. With plans to expand further, the company aims to add 2,000 more charging stations this year, boosting India's EV infrastructure. ATEL has rapidly expanded its network, with 2,338 charging points already up and running across 26 states and 230 cities. This makes it the top Airport Charge Point Operator (CPO) in India, with over 100 charging points at 21 airports.



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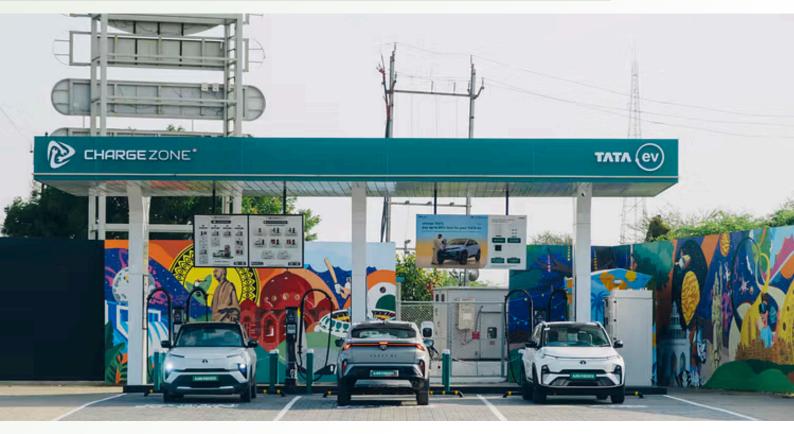






Joint Ventures & Partnerships





ChargeZone - Statiq - TATA EV

TATA.ev Unveils First 10 hashtag#MegaChargers Across India – A New Era of Highway EV Travel Begins!

TATA.ev has officially launched its first 10 ultra-fast MegaChargers at key locations across India – a major step in the rollout of 500 high-speed EV charging stations nationwide.

FUTURE MOBILITY PARTNERS













UPCOMING FUTURE MOBILITY EVENTS



PUNE'S ELECTRONICS EXPO
with Conferences on EV,
Automobile & AI Tech for
Electronics
8-9-10 JAN 2026
Auto Cluster Exhibition Center | Pune |
India



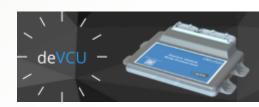
Green Energy India Expo 2025
12th, 13th, and 14th June, 2025
at SS Convention Centre in
Vijayawada,
Andhra Pradesh





INDIA'S LARGEST ELECTRIC VEHICLE SHOW 27 28
JUNE, 2025
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New Launch



Komaki Launches CAT 2.0 Eco

Komaki Electric rolls out the all-new CAT 2.0 Eco, a smart electric utility scooter priced at just ₹69,999 (ex-showroom). Specifically built for gig workers, delivery partners, and small business owners, this model redefines affordable urban and rural mobility.



Zeno Unveils Emara

Revolutionizing Urban Mobility with Impressive Range and Fast Charging Capabilities

Priced: ₹1.19 lakh (ex-showroom)

- Dual swappable 2kWh LFP batteries
- ≈ Payload capacity of 250 kg
- ₩ Made in India with R&D in Bengaluru & San Francisco
- Production starting at Manesar with 600 units/month
- Massive scale-up plans: 50K-70K units annually by end-2025
- § Backed by <u>Toyota Ventures</u>, <u>Lowercarbon Capital</u> & more Zeno is also investing in robust battery swapping infrastructure, with RFID-enabled automated swap stations and a planned rollout of 100+ stations in Bengaluru alone.





New Launch



Nissan Motor Corporation Unveils All-New Micra EV with a 408km Range

Land Rover Range Rover Electric is expected to be launched in India soon







Performance figures are impressive:

- 6.2 kWh battery (3 removable packs)
- 21.5hp peak power | Top speed: 120 km/h
- Front USD forks, rear central strut
- 7-inch TFT with navigation + connectivity
- Integrated front & rear cameras
- Weighs just 143–156 kg, seat height at 765mm

Bajaj Chetak 3503

The Bajaj Chetak 3503 is the most affordable electric scooter in the 35 series, priced at ₹1.10 lakh. It offers a range of 151 km on a single charge, using the same 3.5 kWh battery pack as other Chetak models, but with a lower top speed of 63 kmph.







- Price: ₹1.10 lakh
- Range: 151 km on a single charge
- Battery: 3.5 kWh
- Charging Time: 3 hours 25 minutes for a full charge
- Top Speed: 63 kmph

- Under-seat Storage: 35 liters
- Colours: Brooklyn Black, Cyber White, Matt Grey, Indigo Blue
- Features: Hill hold assist, color LC⁴2
 cluster with Bluetooth and music control,
 call management, Eco and Sports ride
 modes, LED headlights.

New Launch



Mercedes-Benz Trucks Expands eActros 600

Mercedes-Benz Trucks UK is set to redefine electric freight transport by introducing new variants based on the eActros 600, with orders opening in Autumn 2025.







Performance figures are impressive:

- Up to 650 km WLTP range
- Level 2 ADAS, Smart Parking, Driver Monitoring
- → DC Fast Charging: 20–80% in ~30 mins
- India Launch Expected in 2025 with ₹30 lakh Price tag.

Jeep Unveils All-Electric Compass EV

Jeep has officially pulled the wraps off its next-gen Compass EV, and it's everything modern Indian EV buyers have been waiting for – long range, rugged performance, and futuristic tech.







Report - Guide to EV Charging Infrastructure and Grid Integration



Rising oil prices and rising energy demand have led to the high cost and capital consumption, as the transportation ecosystem's reliance on non-renewable energy sources has played an adverse role in recent years. The Government of India has developed a number of policies to encourage and facilitate the development of EV charging infrastructure in India.

The Indian government does not plan to mandate standardized charging ports for electric scooters, allowing manufacturers to use their own standards. This flexibility has resulted in a diverse charging infrastructure, posing challenges for EV owners in ensuring compatibility with public charging stations. Resulting in a varied landscape for EV charging infrastructure.

EV infrastructure encompasses **Level 1**, **Level 2**, **and DC fast chargers**, meeting diverse user needs, from home charging to rapid refuelling at public stations. AC charging is ideal for overnight charging at homes or workplaces with Level 1 & Level 2 standard chargers.

On November 7, 2023, the Ministry of Heavy Industries (MHI) introduced a new phased manufacturing program (PMP) for electric vehicle (EV) charger components under the FAME India Scheme Phase-II to boost domestic production. Outlined a comprehensive list of charger components and their timelines for the transition to domestically manufactured parts.

DC charging, including Level 3 fast chargers, is suitable for rapid charging in commercial areas, highways, and high-traffic locations. **Battery swapping** innovations offer quick alternatives, reducing downtime and addressing range anxiety. EVs can now be charged wirelessly via inductive or resonant systems, thanks to emerging technologies.

Smart grid integration optimizes charging times based on grid demand and renewable energy availability for efficient load management. Charging stations require reliable power, proper infrastructure, spacing, signage, safety features, and compliance with regulations and environmental guidelines. Balancing charging stations in urban and rural areas ensures widespread accessibility. Collaborations among governments, private corporations, and utility suppliers expedite infrastructure expansion by leveraging their assets. Adhering to international charging standards like CCS and CHAdeMO ensures interoperability among EVs and various charging stations through open communication protocols.

Obtaining **Environmental certifications** for charging stations and integrating solar and wind energy into infrastructure enhances sustainability and reduces EVs' carbon footprint.

In this article you will get the Idea of EV infrastructure promises a cleaner, more accessible world. Embrace the journey, where every charge fuels not just vehicles, but a greener tomorrow. The road ahead is electrifying, and the future is now.



Report - Guide to EV Charging Infrastructure and Grid Integration



Annexures

- 1. EV Charging Infrastructure Strategy in India
- a) Working Principle
- b) Types of Charging
- c) Charging levels
- d) Speed of Charger
- e) Fast Charging
- f) Types of Connector
- g) Battery Swapping
- 2. Grid Integration
- a) Distribution from HV bus to charging station unit
- b) Arranging supply
- c) Planning & Requirements for Charging Station
- d) Utilization of different segments
- e) Benefits and Guidelines
- 3. Implementation of Charging Station
- a) Planning and Allocation
- b) Mode of Implementation
- c) Indian Regulation and Standards
- d) Costing and setting up EV public charging station (PCS)
- e) Roles and Responsibilities
- 4. Communication Protocol
- 5. Smart-connected EV Charging
- 6. Government Initiatives and Schemes under Fame II

To access details of annexures, please subscribe at www.gyaniki.com

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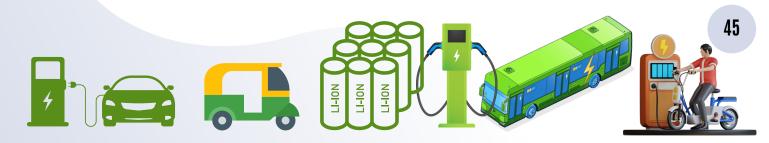
(It Includes only the "Guide to EV Charging Infrastructure and Grid Integration" report)

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Report - Guide to Basics of Semiconductor



The transition of from traditional internal combustion engines (ICE) to electric vehicles (EVs) marks a significant shift in the automotive industry, presenting both challenges and opportunities for individuals and businesses alike.

As the Indian Automobile ecosystem adapts to this transformative trend from the conventional mechanical to electrification path, it becomes imperative for newcomers from mechanical backgrounds to familiarize themselves with the basics of semiconductors and its manufacturing process, a vital component in electrification roadmap.

With OEM's and Tier-1 suppliers gearing up to build their teams and capacities in response to the growing demand for next generation mobility, understanding the fundamental principles of semiconductors becomes crucial for effectively contributing to this dynamic industry.

This compiled report serves as an essential guide commences with an introduction to key PCB components, semiconductors, explaining their role as materials that lie between conductors and insulators. It gets into the atomic structure of semiconductors and the concept of doping, which enhances their electrical properties. An exploration of semiconductor devices, such as microcontrollers, microprocessors, transistors, IC's, diodes, showcases their significance in electronic circuits and their impact on the efficient functioning of automobiles.

Next, the report briefs the **semiconductor manufacturing process**, Moore's Law and steps involved in producing integrated circuits in **fabrication facilities (fabs)**. It discusses the **distinction between fabs, foundries and IMD**, emphasizing their relevance in the current Indian semiconductor ecosystem, where suppliers are positioning themselves to cater to the surging demand for semiconductor chips in the EV market.

Semiconductors play an indispensable role in the efficient functioning of electric drivetrains, battery management systems and charging infrastructure.

As Indian Tier-1 suppliers slowly build their teams and capacity to meet the demands of the fast-growing Indian EV sector, there are **challenges and stiff competition** that are ahead and Government of India is supporting through with necessary research infrastructure and launching incentive schemes through "India Semiconductor Mission".

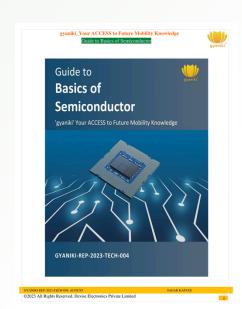
Overall, this report guides new entrants transitioning from mechanical to electrification stream and focusing on the semiconductor domain to navigate their transition successfully and empowering them to contribute effectively to the growing Electrification in Indian Automobile ecosystem.

Report - Guide to Basics of Semiconductor



Report Content

- 1. Key Components on PCB
 - a) Microcontrollers
 - b) Microprocessors
 - c) Hardware Interfacing
- 2. What is Semiconductor
 - a) Semiconductor Devices
 - Transistors: IGBT, MOSFET
 - Integrated Circuits
 - Diodes
 - b) Manufacturing Process
 - c) Moore's Law
- 3. Key Terminologies and Processing Units
 - a) Wafers
 - b) Fabs
 - c) Foundries
 - d) IDM
- 4. Semiconductor Value Chain and Players
- 5. Semiconductor Products and Application
- 6. India's Semiconductor Mission (ISM) and Incentive Schemes



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gyaniki | Your Access to Future Mobility

About gyaniki

'gyaniki' is a technology platform that provides complete coverage of the current & evolving "ACCESS" [Autonomous, Connected, Customized, Electrified, Safe, Shared] to "Future Mobility".

'gyaniki' has evolved as a technology based digital portal platform created for researchers, product developers, industry professionals and academia members with a vision of incremental expansion in bridging the future mobility ecosystem through our services.

'gyaniki' undertakes specialized and customized research in Future Mobility

Our techno-commercial research covers on the core areas of:

- Benchmarking
- · Key Components and Process
- Technologies
- Manufacturers and Suppliers
- Latest & upcoming industry trends (LiDAR, Neural Networks, Sensor fusion)
- Product Development Processes and Documentation (DFMEA, PFMEA, RCA)
- Tools of the trade. In design, simulation & validation (e.g.: GT suite, Simulink)
- Standards, Testing & Regulatory information.

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