



EDUCATE | PROMOTE | AWARE

April 2024

# EV Chargers

Not Just *"What all happened in last 30 days?"* but a lot more...



# EV Update Inside

- Top Electric 2W OEM Sales: April 2024
- Top Electric 3W OEM Sales: April 2024
- Past, Present & Future of EV Charging By Mr. Vibhor Mittal from Belectriq
- EV Milestones
- Top EV Charge Point Operators of India
- New Product launch
- Difference between FPGA based EV charger and normal ev charger by Dr. Muddasani Satyanarayana, CTO Vanix Technologies
- Who Got Funded?
- Commissioning of DC chargers in India: Highlighting the process involved with local DISCOM? by Ms. Manjula Girish, Senior Director at Delta Electronic India
- Join Ventures & Partnerships
- Why Fast EV Chargers are DC? by Mr. Raman Bhatia, MD Servotech Power Systems
- Other EV Updates
- All India EV



# Editor's Message

Dear Readers,

With this edition, we are stepping into the 3rd year of All India EV monthly magazine. I would like to thank you for all of the support you all have given to us.

Keeping this message short, I would like to inform you all that from this edition, our monthly magazine is going to be theme based where every month we will take one segment of the EV industry and will explore it with the help of various industry experts.

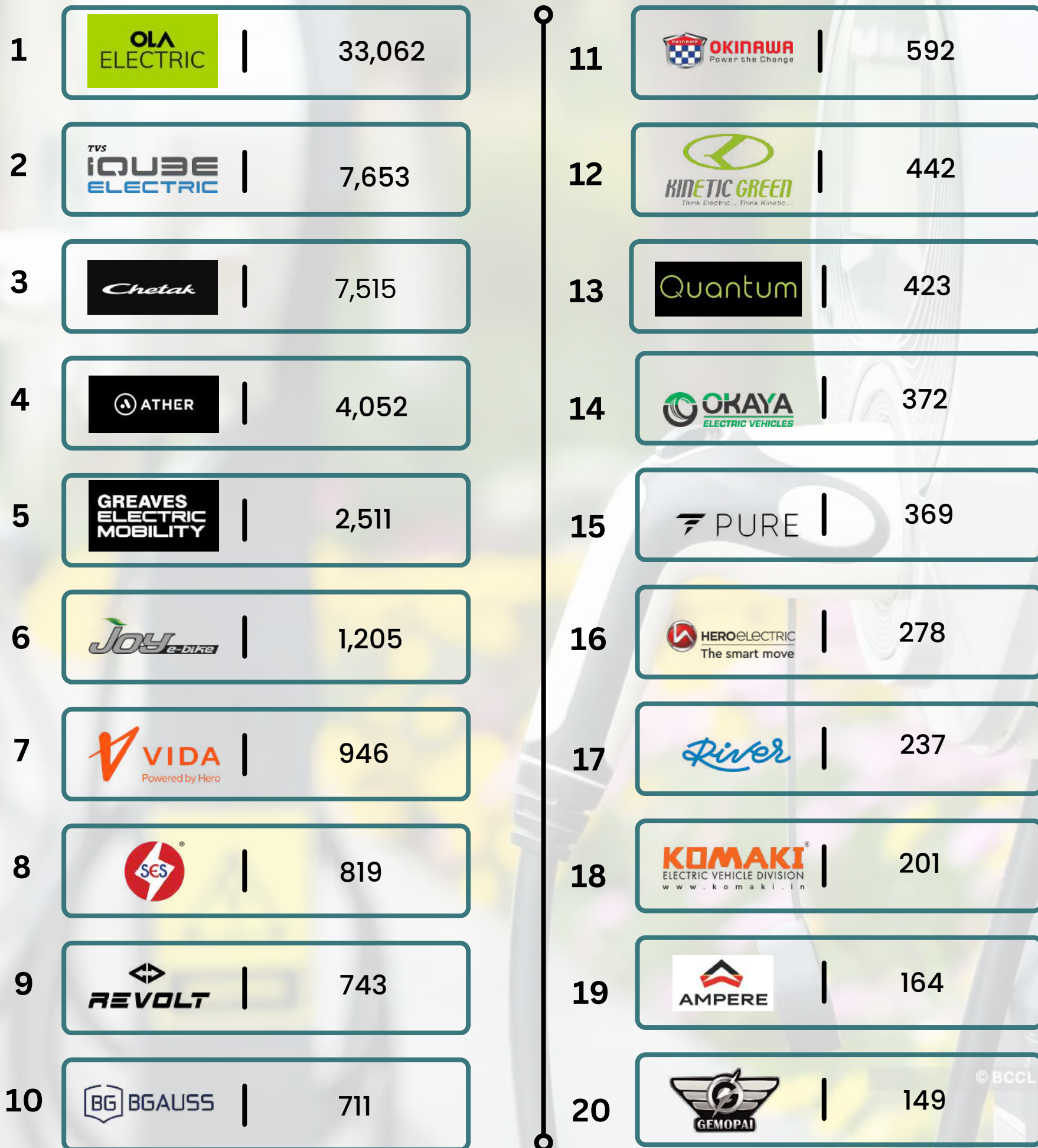
I hope you will like our work and will keep supporting us the way you always have. By the way, can you guess the theme of the next month magazine?

Warm regards,

Ankit Sharma  
Founder, All India EV

# Top EV 2W Manufacturers in India

April 2024 Sales Data





# Top EV 3W Manufacturers in India

April 2024 Sales Data

1	   2,934	11	   783
2	   2,773	12	   727
3	   1,966	13	   705
4	   1,352	14	   699
5	   1,281	15	   623
6	   959	16	   594
7	   956	17	   535
8	   883	18	   527
9	   787	19	   517
10	   788	20	   469

# Past, present & future of Fast EV Chargers in India

**Author: Mr. Vibhor**

**Mittal** IIT and XLRI alumnus and Chief Business Officer  
at Belectriq Mobility

*Belectriq Mobility is on a mission to Charge Sustainable Mobility. They offer a wide range of industry-standard AC and DC chargers to cater to all kinds of EVs available in the Indian market including 2Ws, 3Ws, Cars & Buses etc. The EV chargers are Designed and Manufactured in India; ARAI and CE-approved; highly safe and built to withstand tough Indian weather conditions. It is founded by IIT, ISB, and XLRI alumni with 15+ years of experience in manufacturing power electronics equipment. With a strong focus on 'Innovation' and 'Make in India', Belectriq aims to make India a manufacturing hub for sustainable mobility solutions starting with the EV Chargers.*



The past, present, and future of fast charging for electric vehicles (EVs) in India represent an evolving landscape driven by technological advancements, policy initiatives, and market dynamics. It has undergone significant advancements since its inception, and its trajectory into the future is promising as the EV industry is booming in India with rising sales across all categories 2Ws, 3Ws & 4Ws.

## Past

- ❖ **Initial Infrastructure Development:** In the past decade, India saw the nascent stages of EV adoption and the development of charging infrastructure.

This included the installation of slow AC chargers and low-power DC chargers at select locations, primarily in urban areas.

As the govt allowed multiple charging standards to evolve, all three types of DC chargers GB/T, Chademo & CCS2 were set up across the locations. It was either led by fleet companies, or CPOs and also pushed by govt via several govt agencies (EESL, REIL, IOCL, BPCL, HPCL, Discoms, State Nodal Agencies, etc.) and policy incentives like FAME.

- ❖ **Government Initiatives:** The Indian government introduced various policies and initiatives to promote EV adoption and charging infrastructure development.

Programs like the Faster Adoption and Manufacturing of Electric Vehicles (FAME) scheme provided incentives for both EV purchase and charging infrastructure deployment.

- ❖ **Early Fast Charging Deployment:** While fast charging infrastructure was limited, some early deployments of DC fast chargers emerged, primarily in metropolitan cities and along major highways. These chargers offered moderate charging speeds, typically up to 50 kW.

- ❖ **Localization:** The initial chargers were mostly imported, primarily from China. However several players started working on localizing the assembly.

## Present

- ❖ **Expansion of Charging Infrastructure:** The present scenario witnesses a significant expansion of fast-charging infrastructure across India. Public and private entities are investing in the installation of DC fast chargers at strategic locations, including highways, commercial hubs, and public parking facilities.

- ❖ **Increasing Charging Speeds:** Fast charging technology has advanced, with newer chargers offering higher power outputs. Charging speeds have increased to 100 kW and beyond, reducing charging times and enhancing the convenience of EV ownership.

- ❖ **Interoperability and Standardization:** Efforts are underway to ensure interoperability and standardization of charging infrastructure. For 4Ws and e-buses, CCS2 has become the defector charging standard. For 2Ws/3Ws/LCVS, the recently approved BIS Standard for LEVDC seems to be the choice going forward.



## Future

- Indigenous Technology:** The majority of EV chargers in the market are currently imported with little customization for the Indian environment such as dust, humidity, voltage fluctuations, and high altitude (in Himalayan states). They also suffer from a lack of proper integration with locally developed charging Apps. Indigenous technology including the controller, power module, and charging cables will bring down the prices, make components serviceable, enable software customization, and increase the reliability/uptimes of chargers.
- Ultra-Fast Charging Networks:** The future of fast charging in India will likely see the deployment of ultra-fast charging networks capable of delivering charging speeds exceeding 150 kW, and potentially reaching 350 kW or higher. These ultra-fast chargers will significantly reduce charging times, making EVs more attractive to consumers.

- Integration with Renewable Energy:** There will be a greater emphasis on integrating fast charging infrastructure with renewable energy sources such as solar and wind power. This integration will not only reduce the carbon footprint of EV charging but also contribute to India's renewable energy goals.
- Software Upgrade to OCPP2.0:** The Open Charge Point Protocol (OCPP) is an application protocol for communication between EV chargers and central management systems. The Indian market is currently using OCPPv1.6 but is expected to upgrade to OCPPv2.0 shortly. This OS upgrade in EV Chargers as well as the Charging Software will unlock new and improved features for device management, transaction handling, credit card payments, security, smart charging functionalities, plug & charge, etc

	Past	Present	Future
Vehicle Type	e4Ws	e4Ws Premium e2Ws & e3Ws	All e2Ws, e3Ws, e4Ws
Connector Types	CCS2, GB/T, Chademo	CCS2, GB/T, LEVDC	CCS2, LEVDC
Power Rating (Most Popular)	LCVs: 15kW/30kW, Cars: 25kW /50kW, Buses: 180kW	2Ws: 3kW, LCVs: 15kW/30kW, Cars: 30kW /60kW, Buses: 180kW/240kW	2Ws: 3kW, LCVs: 12kW, Cars: 60kW /120kW, Buses: 360kW/480kW
Voltage	Upto 500V/750V	Upto 750V	Upto 1000V
Chargers	Mostly Imported	Mostly Assembled Locally	Local Manufacturing
Coverage	Tier 1 Cities	Tier 1 & 2 cities, Highways and Hotels	All India Coverage including all highways and fuel stations
Technological Developments	Internet Connectivity Safety Billing Payment	Additional: AutoCharge Static Load Balancing	Additional: Plug & Charge, Cyber, Security, Cable Management, Smart Sensors, Dynamic Load, Balancing, Remote Diagnostics, Grid Integration, Doorstep on, demand Charging, Power Quality Management, Wireless Charging, V2G, MegaWatt Charging
Charging Apps	Multiple Charging Apps	Multiple Charging Apps with limited OCPI Partnerships	Few Charging Apps connected via OCPI / UEI etc. National Database
Customer Loyalty Programs	None	Premium Support Reservation Facility	Reservation Facility with priority queuing Premium Support Subscription Plans
Site Selection	Random	Expert Assessment	Complex Data Analysis
Pricing Strategy	Fixed rates per location	Preferable rates for select user groups	Dynamic based on demand and supply
Renewable Energy	None	Few projects with integrated Solar Power	Large focus on Solar Powered Charging Station

- ❖ **Smart Charging Solutions:** Future charging infrastructure will incorporate smart charging solutions, allowing for dynamic pricing, demand response, and grid integration. Smart charging algorithms will optimize charging schedules based on factors like energy demand, grid stability, and user preferences
- ❖ **Enhanced User Experience:** Future CCS2 charging stations will focus on improving the user experience through features such as enhanced payment options, improved reliability, and integration with navigation systems to locate and reserve charging stations in real time.
- ❖ **Rural and Urban Expansion:** Charging infrastructure deployment will extend beyond urban centers to include rural areas, ensuring equitable access to fast charging facilities across the country. Additionally, residential and community charging solutions will gain prominence, catering to the charging needs of EV owners living in apartments and housing complexes.

- ❖ **Doorstep Charging:** Range anxiety will be a thing of the past if instead of customers going to the charging station, the charger comes to the customer 24/7 at the desired location which can either be home, office, market, or even in the middle of the road in an emergency.

A fast or slow charger connected either with portable power banks or powered by a dynamo is fitted inside a light commercial vehicle to provide doorstep charging.

Overall, the past, present, and future of fast charging for electric vehicles in India reflect a transition toward a more robust and accessible charging ecosystem, driven by technological innovation, policy support, and market demand.



# Milestones

## MG Surpasses 500 EV Charger Installations Across India



MG (Morris Garages) has deployed 500 chargers within 500 days as part of its MG Charge initiative in India. This initiative aims to establish a sustainable and easily accessible electric vehicle (EV) charging infrastructure nationwide.

Launched in mid-2022, the MG Charge initiative is dedicated to installing 1,000 charging points within 1,000 days.

## Tata Power Reaches Milestone: 1000 Green Energy-Powered EV Charging Points Installed in Mumbai



Tata Power, a leading integrated power company and provider of EV charging solutions, has achieved a groundbreaking feat by powering 10 crore (100 million) green kilometers across various segments of EV charging infrastructure nationwide.

This achievement underscores Tata Power's pivotal role in advancing sustainable mobility solutions in India, aligning with the nation's vision for clean and green transportation.

## Citroen Makes History By Exporting Made-In-India Electric Vehicles To Global Markets



Citroen has reached a significant milestone by becoming the first multinational car manufacturer in India to export locally manufactured electric vehicles (EVs) to international markets. The ceremonial departure of the inaugural shipment of 500 units of the Made-in-India Citroen e-C3 to Indonesia from Kamarajar Port marks a momentous occasion in India's journey towards sustainable mobility and global competitiveness.

# Top Charge Point Operator of India

Companies that are  
Leading and have  
taken the  
Responsibility to  
Electrify the  
Nation

ATHER GRID

VerdeMobility  
CHARGING INTO THE FUTURE

TATA POWER  
EZ CHARGE

EVRE

CHARGE ZONE  
POWERING THE FUTURE



BOLT.EARTH

VOLT TIC

Lubi  
EV SOLUTIONS

-chargepoint+



charzer

GLIDA  
All lights green!

Vanix

DELTA

bp pulse

STATIQ



magenta

kazam

PLUG&GO  
A RAPID CHARGING ZONE



ElectriVa

ZEON  
CHARGING

go-go

BRIGHTBLU

Numocity

belectriq



# New Product Launch



## Terra Charge Unveils New Made in India EV Chargers to Meet Growing Demand

Terra Charge has launched two cutting-edge 3.3kW EV chargers tailored for diverse user needs. The new chargers, named KIWAMI and TAKUMI, signify Terra Charge's commitment to providing advanced charging solutions while bolstering the 'Make in India' initiative.

## BMW Unveils First-Ever i5 M60 xDrive In India: A Fusion Of Performance And Sustainability

BMW unveiled the first-ever BMW i5 M60 xDrive in India. As the newest addition to the BMW M Performance lineup, this all-electric sedan sets a new standard for elegance, innovation, and dynamic performance. Available exclusively as a Completely Built-Up Unit (CBU) model, the BMW i5 M60 xDrive showcases a fusion of cutting-edge technology and sporty design features.



## Pre-Bookings Open For Ferrato Disruptor: Electric Motorcycle Combining Power And Sustainability

Ferrato, a brand under Okaya EV, has commenced pre-bookings for its latest electric motorcycle, the 'Disruptor'. Targeted at riders seeking a sporty experience without compromising sustainability, the Disruptor blends power, style, and state-of-the-art technology at a cost of 25 paisa per kilometre.

## Honda Unveils Next-Generation e:N Series Electric Vehicle Models at Auto China 2024

Honda Motor Co., Ltd. made a significant splash at the 18th Beijing International Automotive Exhibition (Auto China 2024) by unveiling the highly anticipated second set of Honda e:N Series electric vehicle (EV) models – the all-new e:NP2 and e:NS2



## Ultraviolette Launches F77 Mach 2: Revolutionizing Electric Motorcycle Industry

Building upon the success of its predecessor, the F77 Mach 2 represents the latest addition to Ultraviolette's line-up of performance electric motorcycles, boasting unparalleled advancements in technology and performance.

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### Log9 Unveils Amphion: Redefining Efficiency In Commercial EV Operations

Log9 announced the rebranding of its mobility business as 'Amphion' – a comprehensive EV asset management company. The unveiling of Amphion took place at Day Zero 2024, Log9's annual event.

### Hero Lectro Launches Muv-E, H4 and H7+: Tailored For Indian Market

Hero Lectro introduces its latest innovation: Muv-E, a groundbreaking cargo e-cycle designed for fleet operators, small business owners, and delivery riders. Priced at INR 61,999. Hero Lectro, Firefox Bikes brand, has introduced its latest models: the H4 and H7+. Priced at an introductory rate of INR 32,499 and INR 33,499 respectively



### Hyderabad Startup Juiy Launches App - Makes EV Buying a Breeze

In a significant stride toward sustainable transportation, Juiy, a newly launched Electric Vehicle Buying Assistant App, made its debut. The event received the esteemed presence of Telangana's IT Minister, Shri. D. Sridhar Babu garu, showcasing the state's proactive stance on emerging technologies.

### CASHe Introduces CASHe Green: Innovative Financing For Electric 2-Wheelers

CASHe, a fintech platform leveraging AI for credit solutions, has introduced 'CASHe Green' tailored for electric 2-wheeler (E2W) financing. This initiative caters to the burgeoning E2W sector with bespoke financial packages. Partnering with three leading two-wheeler manufacturers, CASHe Green offers a seamless, digital lending experience.



### Speedways Electric Unveils UNO: A Game-Changer in Low-Speed Electric Vehicles

Speedways Electric made waves with the launch of its latest innovation – the UNO Low-Speed Electric Vehicle (LSEV). Positioned as a trailblazer in urban mobility, the UNO promises to redefine convenience, versatility, and sustainability in transportation.





### Vioma Motors Unveils Thunderbolt E-Scooter and Starc Electric Bike,



Vioma Motors, a pioneering E-mobility platform, has taken a bold step forward in addressing the prevalent challenge of range anxiety in the electric vehicle (EV) industry. With a holistic approach to vehicle design and manufacturing, Vioma Motors recently unveiled their latest marvels – the Thunderbolt e-scooter and Starc electric bike, signaling a new dawn in urban transportation.

### AMO Mobility Unveils Jaunty i Pro: A New Era In Electric Two-Wheeler Mobility

AMO Mobility, has introduced Jaunty i Pro, a modern high-speed intelligent scooter priced at INR 1.15 lakh. Featuring a range of 120 km on a single charge, with an advanced 2.52 kWh battery, enabling a charging time of around 3.5 hours. Additionally, it offers three speed modes – Economic, City Ride, and Power Mode, capable of reaching speeds up to 60km/hr.



### Ather Energy Unveils Rizta: The Next Generation Family Scooter For Indian Roads



Ather Energy, introduced its latest family scooter, the Rizta. Priced at INR 1,09,999 (Ex-showroom Bengaluru), the Rizta is designed to meet the needs of families.

It offers a variety of colors, including monotone and dual-tone options, and promises a range of 123 kms for the 2.9 kWh variants and 160 kms for the 3.7 kWh variant, making it suitable for daily commuting needs.

### Xiaomi Launches Groundbreaking SU7 Electric Vehicle with Hesai's Advanced Lidar Technology

Xiaomi, a leading technology company, has made a significant leap into the electric vehicle market with the official launch of its first mass-produced electric vehicle, the Xiaomi SU7, in Beijing. This high-performance sedan, representing Xiaomi's prowess in car manufacturing, comes equipped with Hesai's cutting-edge lidar technology, setting a new standard in intelligent driving capabilities.

The Xiaomi SU7, available in Pro and Max versions, has garnered immense attention with over 88,898 reservations within the first day of its release.







### Switch Mobility done the inaugural of IeV 4 electric light commercial vehicle from its Hosur facility.

The launch of the IeV 4 signifies the beginning of manufacturing for Switch Mobility's lineup of electric light commercial vehicles (e-LCVs), known as the IeV series. The company aims to produce approximately 3,000 units annually, serving a wide range of purposes such as cargo transportation, container handling, waste collection, and refrigerated vans.

### Lectrix EV Unveils Revolutionary Electric Two-Wheeler With Battery Subscription Model

Lectrix EV, the electric mobility arm of the legendary SAR Group, launches a groundbreaking E2W at just INR 49,999. Lectrix EV is the first OEM, particularly in India, to separate the battery from the vehicle and provide it to customers as a service..

The product comes with a best-in-class range of 100 kms in just one charge, speed clocking around 50 kmph and a lifetime battery warranty thereby alleviating any battery-related concerns





# FPGA based EV Charger & Normal EV Charger

## A Technical Analysis

**Author: Dr. Muddasani Satyanarayana**

CTO: Vanix Technologies

As the world races towards a sustainable future transportation, the transformation of Electric Vehicle (EV) charging infrastructure stands as a critical frontier of innovation. At the heart of this evolution lies a distinct departure from traditional charging paradigms towards the adoption of FPGA-based solutions. These cutting-edge technologies herald a new era in charging infrastructure, redefining standards of performance, scalability, and adaptability. This editorial embarks on an in-depth exploration of the profound differences between conventional EV chargers and their FPGA-based counterparts, illuminating the revolutionary potential and transformative impact of FPGA technology on the future of electric mobility.

### Enhancing Upgradability, Scalability and Reconfigurability:

FPGA-based EV chargers offer unparalleled upgradability and scalability. Unlike conventional chargers, which often necessitate hardware replacements for upgrades, FPGA-based chargers leverage hardware reconfigurability through **Hardware Description Language (HDL)**.

The utilization of HDL empowers FPGA-based chargers to adapt to evolving standards and protocols with ease. By programming the FPGA fabric, developers can implement custom logic tailored to specific requirements, thereby optimizing performance and functionality.

This dynamic reconfigurability ensures that FPGA-based chargers can efficiently accommodate emerging standards and protocols, ensuring that chargers remain at the forefront of technological advancements without requiring extensive hardware overhauls.

### Multi-Gun Functionality Made Simple:

Unlike the current EV chargers in the market, the FPGA-based chargers excel in simplifying multi-gun functionality.

Through FPGA-based architecture, chargers can efficiently manage multiple charging ports, optimizing resource allocation and ensuring consistent performance across all channels.

This streamlined approach not only enhances user experience but also maximizes charging station efficiency, catering to the growing demand for multi-gun charging solutions in urban environments.



Thus a single charging system consisting of an FPGA can cater two wheelers, three wheelers and four wheelers using a multi-gun EV charging system.

### Advanced Encryption and Secure Authentication:

Security is paramount in EV charging infrastructure, and FPGA-based chargers offer advanced encryption and secure authentication mechanisms to safeguard user data and transactions.

By leveraging pure FPGA fabric on top of ARM cortex processor capabilities, these chargers can implement robust encryption algorithms and authentication protocols, mitigating security risks and ensuring data integrity throughout the charging process.

### Enhanced Performance and Low Power Consumption:

FPGA-based chargers boast superior performance attributes, owing to their optimized hardware design, efficient resource utilization and parallel processing.

Furthermore, these chargers exhibit low power consumption, contributing to environmental sustainability and cost-effectiveness. This combination of enhanced performance and reduced power consumption positions FPGA-based chargers as optimal choices for future EV charging infrastructure.

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## Well-Developed Ecosystem and Connectivity:

The well-developed ecosystem surrounding FPGA technology facilitates seamless integration with existing EV infrastructure.

This fosters interoperability and compatibility across diverse platforms and networks, ensuring smooth operation and efficient communication within the charging ecosystem. FPGA-based chargers leverage connectivity features to enhance network integration and communication capabilities.

With support for protocols such as Ethernet and CAN bus, these chargers can seamlessly integrate with Smart Grid systems, enabling dynamic power management and grid optimization. Additionally, FPGA-based design optimizations contribute to reduced power consumption, making them environmentally friendly and cost-effective solutions for EV charging infrastructure.

## Benefits of combined multicore Processor and Pure FPGA Fabric:

By harnessing the processing power of ARM Cortex processors and the versatility of pure FPGA fabrics, FPGA-based chargers achieve unparalleled performance and flexibility.

ARM Cortex processors handle control and management tasks efficiently, while FPGA fabrics enable real-time processing and customizable logic implementation, ensuring optimal performance and adaptability in diverse operating environments.

## Reduced Latency of Processing and Cost Considerations:

FPGA-based chargers exhibit reduced latency of processing, thanks to their optimized hardware design and efficient resource utilization. This translates into faster charging times and enhanced user experience.

While initial investment costs for FPGA-based chargers may exceed those of traditional chargers, the long-term benefits far outweigh the upfront expenses.

The scalability, upgradability, and efficiency offered by FPGA-based chargers result in lower total cost of ownership over their lifecycle, making them prudent investments for EV charging infrastructure.

## Vanix Offerings for EV Market:

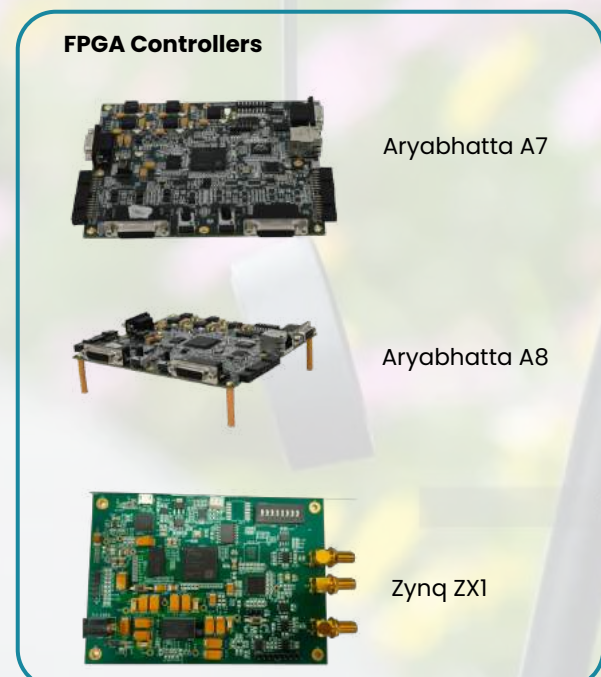
### Vanix's EVSE AC Charger:

Vanix Technologies is gearing up to launch FPGA-based EVSE AC chargers into the market. These chargers are available in single-gun and multi-gun configurations.

Vanix Technologies planned to release our 7.4kW and 11kW EVSE AC chargers for single-gun setups in the first phase soon.

### Vanix's Remote IoT Monitoring Solution for battery and EV:

- **Cutting-edge Solution:** Vanix Technologies introduces an innovative remote monitoring solution for BMS and EV tracking.
- **Wide Voltage Support:** The telematics device is designed to work with various BMS solutions, accommodating battery stock voltages ranging from as high as 150V to as low as 3V.
- **Performance Benefits:** Leads to a 30% reduction in EV downtime and enhances battery lifespan by over 25%, optimizing operational efficiency and reducing maintenance costs.
- **Cloud Platform Integration:** Our cloud platform 'OmniSYS' features advanced analytics and interactive infographics, enabling real-time monitoring of system performance and system health while offering customizable dashboards for user convenience.





# Funding and Investment

- **BluWheelz Raises USD 1 Million To Drive Expansion In EV Market**

BluWheelz, a company providing tech-enabled logistics solutions for mid and last-mile delivery, has secured USD 1 million in bridge funding, led by Venture Catalysts. Other investors include FAAD, LetsVenture, and Chakra Growth Fund.



- **Advik Expands Into EV And Energy Storage Sectors With Acquisition Of Aceleron Energy**

Advik, a manufacturer of automotive components, has recently finalized the purchase of the business assets belonging to Aceleron Energy Ltd. recognized for its advanced Li-ion batteries. This strategic move marks Advik's entry into the Electric Vehicle (EV) and Energy Storage System (ESS) sectors, in line with its expansion strategy.



- **AutoNxt Automation Secures Pre-Series A Funding Led by Saama to Propel Electric Tractor Innovation in India**

AutoNxt Automation specializing in high-torque electric powertrains and off-road autonomous technologies, has announced the successful closure of its Pre-Series A funding round. Saama led the investment, with contributions from notable investors including Amit Singhal, former head of Google's search division, and Suveer Sinha, India Head for KKR Capstone, among others.



- **EvolutionX Debt Capital Invests INR 410 Crore In Ola Electric Mobility's IPO Preparations**

Electric scooter manufacturer Ola Electric Mobility Ltd, preparing for its initial public offering (IPO), has secured INR 410 crore (approximately USD 50 million) through non-convertible debentures from EvolutionX Debt Capital, as indicated by filings submitted to the Registrar of Companies (RoC).





# Commissioning of DC chargers in India:

Highlighting the process involved with local DISCOM

**Author: Ms. Manjula Girish**

Senior Director at Delta Electronic India

India is on the cusp of a transportation revolution, with electric vehicles (EVs) emerging as a key driver of sustainable mobility. As the country transitions towards a greener future, the establishment of robust charging infrastructure is paramount. Among the various charging solutions, Direct Current (DC) chargers play a crucial role in addressing range anxiety and enabling convenient charging for EV users. In this article, we explore the commissioning process of DC chargers in India, focusing on the collaborative efforts between Delta Electronics India and local Distribution Companies (DISCOMs) to drive the adoption of electric mobility.



## Understanding DISCOMs and their Role in EV Charging:

DISCOMs are the backbone of electricity distribution in India. They are responsible for delivering electricity from the transmission grid to end consumers, including residential, commercial, and industrial establishments. They manage the distribution network, ensuring reliable and efficient power supply within their designated areas.



In the context of EV charging infrastructure, DISCOMs play a critical role in:

- **Sanctioning Load:** EV chargers, especially DC fast chargers, require a significant amount of power. DISCOMs assess the application, evaluate the existing grid capacity, and sanction the required load for the charging station.
- **Providing Electricity Supply:** DISCOMs physically connect the charging station to the grid and provide the necessary electricity supply based on the sanctioned load.
- **Metering and Billing:** DISCOMs install meters at the charging station to measure electricity consumption and bill the station owner accordingly.
- **Regulatory Compliance:** DISCOMs ensure the charging station complies with all relevant technical and safety regulations set forth by the government or regulatory bodies.

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## Commissioning Process: A Collaborative Approach

Commissioning a DC fast charger in India involves a seamless collaboration between the EV charger provider (like Delta Electronics India) and the local DISCOM. Here's a breakdown of the typical process:

- **Site Selection and Planning:** The journey begins with identifying a suitable location for the charging station. The EV charger provider considers factors like:
  - **Accessibility:** The location should be easily accessible to potential EV users, with convenient parking options.
  - **Proximity to Users:** Ideally, the station should be situated along major highways, near commercial centers, or in residential areas with a high concentration of EVs.
  - **Grid Availability:** A critical factor is the existing grid infrastructure at the chosen location. The provider conducts a feasibility study to assess the available power capacity and determine if grid upgrades are necessary.

## Application for Load Sanction

Based on the feasibility study, the EV charger provider submits a formal application to the local DISCOM for load sanction. This application typically includes:

- **Applicant Details:** Information about the applicant company and the proposed charging station location.
- **Technical Specifications:** Detailed specifications of the DC fast chargers, including power rating, number of charging points, and any specific functionalities.
- **Single Line Diagram (SLD):** A technical diagram depicting the proposed electrical connection layout, including transformers, metering equipment, and connection to the grid.
- **Layout Plan:** A visual representation of the charging station layout, showing the location of chargers, transformers, and other equipment within the designated space.

## DISCOM Evaluation and Approval:

Upon receiving the application, the DISCOM takes center stage:

- **Technical Feasibility Assessment:** The DISCOM evaluates the application, assessing the technical feasibility of the proposed setup based on the provided SLD and technical specifications.
- **Grid Capacity Evaluation:** They analyze the existing grid capacity at the proposed location to determine if it can accommodate the additional load required by the DC fast chargers.
- **Potential Impact Assessment:** The DISCOM may consider the potential impact on existing consumers in the area, ensuring sufficient power availability for everyone.
- **Site Visit (Optional):** In some cases, the DISCOM may conduct a site visit to verify the details provided in the application and assess the suitability of the location.



After due diligence, the DISCOM issues a sanction letter, a critical document for the next step. This letter confirms the sanctioned load for the charging station, specifying the maximum power capacity allowed and any specific requirements or conditions that the EV charger provider needs to adhere to.

### Metering and Billing Agreement

With the sanctioned load secured, the EV charger provider collaborates with the DISCOM to establish a metering and billing agreement. This agreement defines the type of meter to be installed at the charging station to measure electricity consumption accurately. It also outlines the method for calculating electricity charges and the billing process for the EV charger provider.

### Regulatory Compliance

Compliance with regulatory requirements is a critical aspect of the commissioning process. Delta Electronics India works closely with DISCOMs to navigate the regulatory landscape and obtain necessary approvals and permits for installing DC chargers. This includes adhering to safety standards, obtaining clearances from local authorities, and complying with relevant regulations governing the deployment of charging infrastructure.

### Installation and Testing

the designated sites. The installation process involves mounting the charging equipment, connecting it to the electrical grid, and configuring the necessary hardware and software components. Delta's team of certified technicians ensures that the installation is carried out with precision and adherence to industry best practices.

Following the installation, rigorous testing and commissioning procedures are conducted to verify the functionality and performance of the DC chargers. This includes conducting load tests, voltage measurements, and safety checks to ensure compliance with specifications and standards. Delta employs advanced testing equipment and diagnostic tools to identify any potential issues and address them promptly, thus ensuring the reliability and efficiency of the charging infrastructure.

### Integration with Grid Management Systems

ensure efficient utilization of electrical resources. Delta Electronics India collaborates with DISCOMs to establish seamless communication between the charging infrastructure and the grid management systems, enabling real-time monitoring and control of charging activities. This integration allows DISCOMs to manage load distribution, balance grid demand, and implement demand-response strategies to enhance grid stability and reliability.

### User Engagement and Awareness

In addition to deploying charging infrastructure, Delta Electronics India actively engages with stakeholders to raise awareness about electric mobility and promote the benefits of EV adoption. This includes conducting outreach programs, organizing educational workshops, and partnering with local communities to foster a culture of sustainability. By empowering consumers with knowledge and information, Delta aims to accelerate the transition towards electric mobility and drive positive environmental impact.

*The commissioning of DC chargers in India represents a significant milestone in the country's journey towards sustainable transportation. Through collaborative efforts with local DISCOMs, Delta Electronics India is playing a pivotal role in expanding the charging infrastructure network and promoting the adoption of electric mobility. By adhering to stringent quality standards, regulatory compliance, and best practices, Delta ensures that its DC chargers deliver reliable performance and contribute to the growth of the EV ecosystem. As India continues to embrace electric mobility, the partnership between Delta and DISCOMs will be instrumental in shaping the future of transportation and driving positive change for generations to come.*





# Joint Ventures and Partnerships

- **E-Fuel Collaborates to Supercharge India's EV Infrastructure**

In a bid to revolutionize India's electric vehicle (EV) infrastructure, E-Fuel, a pioneering entity in sustainable energy solutions, has inked a Memorandum of Understanding (MOU) with a prominent developer of EV charging controllers.

- **Revamp Moto Partners with NACOF Oorja to Revolutionize Rural Mobility with Sustainable Electric Vehicles**

Under this partnership, Revamp Moto will utilize NACOF's vast farmer network, exceeding 8 crore members, to market and distribute its portfolio of best-in-class electric vehicles. The aim is to reach a wider audience of micro-entrepreneurs in rural and agricultural India, empowering them with sustainable mobility solutions.

- **Honda and Asahi Kasei Announce Collaboration for Battery Separator Production in Canada**

Honda Motor Co., Ltd. has revealed a significant collaboration with Asahi Kasei Corporation for the production of battery separators for automotive batteries in Canada. The two companies have reached a basic agreement and will commence detailed discussions with the aim of establishing a joint venture company by the end of 2024.

- **Bounce Infinity Teams Up With BaaYu To Boost EV Adoption In Assam**

Bounce Infinity has announced a strategic partnership with BaaYu, an EV Bike-Taxi initiative by Bikoze Ecotech Pvt. Ltd. partners with Assam State Transport Corporation (ASTC). This collaboration aims to expand the presence of electric vehicles (EVs) in Assam, marking a significant milestone in Bounce Infinity's mission to enhance the accessibility and efficiency of electric transportation across India.

- **Ecofy And Vidyut Collaborate For Affordable EV Ownership In India**

Ecofy and Vidyut, an innovative platform specializing in enhancing affordability for electric three-wheeler ownership, have announced a strategic alliance aimed at advancing sustainable transportation solutions. Under this partnership, Ecofy will provide financing while Vidyut will introduce a subscription-based battery-as-a-service model, ensuring accessible electric vehicle (EV) solutions.



- **MG Motor India Teams Up With Epsilon Group For Infrastructure Boost**

Power EV will deliver tailored charging technologies for MG's EVs, featuring a variety of AC and DC chargers ranging from 22kW to 120kW speeds, supported by Power Panel Management Software. This initiative aligns with MG Motor India's 'MG Charge' program, which aims to establish 1,000 charging points across residential communities within 1,000 days.

- **Energy Industry Unites to Launch Unified Energy Interface (UEI) for Seamless EV Charging Network**

In a groundbreaking move aimed at revolutionizing the electric vehicle (EV) charging landscape, 20 leading energy companies have joined forces to establish the Alliance for an open energy network, unveiling the Unified Energy Interface (UEI). This innovative platform, akin to the Unified Payments Interface (UPI), is designed to facilitate seamless payment and transaction interoperability within EV charging networks, transcending brand limitations and enhancing user experience.

- **Yulu's Electric Mobility Enters Kochi Through Collaboration With Zeco Mobility**

Zeco Mobility, a local firm, announced the commencement of its operations in Kochi. The launch coincides with the auspicious occasion of Vishu and marks the expansion of Yulu's services outside major cities. Under the partnership, Zeco Mobility, led by clean energy and mobility entrepreneur R Shyam Shankar, will independently operate Yulu's electric vehicle (EV) service in Kochi with support from Yulu in terms of infrastructure and technology.

- **SWITCH Mobility And MoEVing Join Forces To Roll Out 2,500 Electric LCVs**

Switch Mobility Ltd., the electric vehicle division of the Hinduja Group, has entered into a Memorandum of Understanding (MoU) with MoEVing, an electric mobility platform, to supply 2,500 units of its leV4 electric light commercial vehicles (LCVs).

- **Caret Capital and Ev2 Ventures Join Forces to Launch \$50 Million Early-Stage Sustainability Fund**

In a groundbreaking collaboration, two renowned venture capital firms, Caret Capital (formerly known as Supply Chain Lab) and Ev2 Ventures, have joined hands to establish a \$50 million India Focused Early-Stage Sustainability Fund, Caret Capital Fund II. This strategic alliance aims to fuel the growth of pre-Series A startups operating in the interconnected sectors of mobility, distribution, and employment, crucial pillars for India's burgeoning economy.



- **Neuron Energy Partners With Urja Mobility To Transform E-Rickshaw Fleet In Kolkata**

In Kolkata and its vicinity, e-rickshaws, commonly known as 'toto,' are poised to transition to lithium-ion batteries through the introduction of a battery leasing initiative, officials revealed on Sunday. Neuron Energy, a manufacturer of lithium-ion batteries, has collaborated with Urja Mobility to pioneer this leasing model, previously seen mainly in the business-to-business EV sector.

- **Montra Electric And Bike Bazaar Join Forces For EV Financing**

Montra Electric, an EV brand under the Murugappa Group, has forged a strategic alliance with Bike Bazaar to provide vehicle financing. This collaboration aims to enhance accessibility to electric three-wheelers by offering attractive financing options, including reduced interest rates and extended loan durations.

- **PURE EV and Pragmatic Design Solutions Ltd Join Forces to Revolutionize Electric Mobility**

With a shared commitment to transforming electric transportation and enhancing affordability, the collaboration aims to develop a high-performance electric 2W leveraging solid-state battery technology. The JV, headquartered at the Coventry University Technology Park, UK, renowned as the world's leading automotive hub, will spearhead innovation in the EV sector.

- **Tesla Power India and E-Ashwa Automotive Collaborate to Introduce India's First Electric 2W Vehicle with Built-In Fire Suppression System**

In a groundbreaking partnership, Tesla Power India Pvt. Ltd. and E-Ashwa Automotive have joined forces to unveil India's inaugural electric two-wheeler (2W) equipped with an integrated fire suppressant system. This pioneering feature marks a significant advancement in safety standards for electric vehicles (EVs) nationwide.

- **Omega Seiki Mobility and Exponent Energy Revolutionize Urban Transportation with OSM Stream City Qik**

Omega Seiki Mobility has joined forces with Exponent Energy to introduce an unparalleled innovation in urban transportation: the world's fastest charging passenger electric three-wheeler, the OSM Stream City Qik. Priced at Rs 3,24,999/- (Ex-Showroom), this revolutionary vehicle sets a new benchmark with its remarkable 15-minute rapid-charging capability, powered by Exponent's cutting-edge technology.



- **EU-India Joint Initiative: Calling EU Start-Ups For Electric Vehicle Battery Recycling Ventures**

The Delegation of the European Union to India, in collaboration with The Office of the Principal Scientific Adviser to the Government of India, has announced an Expression of Interest (EOI) for start-ups and SMEs operating in the EU specializing in Electric Vehicle Battery Recycling Technologies. This initiative falls under the umbrella of the EU-India Trade and Technology Council (TTC).

- **Bounce Infinity And Clean Electric Introduce Electric Scooters With Advanced Liquid-Cooled Battery Technology**

Montra Electric, an EV brand under the Murugappa Group, has forged a strategic alliance with Bike Bazaar to provide vehicle financing. This collaboration aims to enhance accessibility to electric three-wheelers by offering attractive financing options, including reduced interest rates and extended loan durations.

- **Accelerating India's EV Revolution: Adani Total Energies E-Mobility And MG Motor India Collaborate For Charging Solutions**

Adani Total Energies E-Mobility Limited (ATEL) has entered into a Memorandum of Understanding (MoU) with MG Motor India to bolster the electric vehicle (EV) charging infrastructure in India. The collaboration aims to develop charging solutions and value-added services for MG's EV customers nationwide.

- **Greaves Retail Enters Strategic Partnership with Tsuyo Manufacturing to Advance Electric 3-Wheeler Segment**

Greaves Retail has forged a strategic alliance with Tsuyo Manufacturing Pvt. Ltd., a pioneering Indian firm specializing in electric vehicle components. This milestone agreement signifies Greaves Cotton's steadfast commitment to bolstering its presence in the low-speed electric 3-wheeler (L3) vehicle segment.

- **Yulu And Yuva Mobility Team Up For Electric Mobility Expansion In Indore**

Yulu has officially rolled out its services in Indore, Madhya Pradesh, in collaboration with local firm Yuva Mobility. This eagerly awaited launch in India's cleanest city marks the commencement of Yulu's electric vehicle (EV) operations in Indore, with Yuva Mobility, led by entrepreneurs Tarun Sharma and Shivani Sharma, taking the reins under Yulu's guidance.



- **Hyundai and Kia Partner with Exide Energy for EV Battery Localization in India**

Hyundai Motor Company (Hyundai Motor) and Kia Corporation (Kia) have signed a Memorandum of Understanding (MOU) with Exide Energy Solutions Ltd. (Exide Energy), a leading Indian battery company.

The signing ceremony, held at Hyundai Motor Group's Namyang Research and Development Center in South Korea, was attended by key executives including Heui Won Yang, President and Head of Hyundai Motor and Kia's R&D Division, and Dr. Mandar V Deo, Managing Director, and CEO of Exide Energy.

- **Zen Mobility And ElectroRide Join Forces To Expand EV Access In Delhi NCR**

Zen Mobility announced the expansion of its retail footprint in Delhi NCR through a collaboration with ElectroRide, a prominent electric vehicle retail provider. This partnership aims to broaden the accessibility of Zen Mobility's versatile EVs to retail consumers in the Delhi NCR region.

- **Servotech Power Systems Ltd. and Electra EV Collaborate on Groundbreaking EV Charger Technology**

Servotech Power Systems Ltd., have joined forces with Electra EV to introduce a groundbreaking EV charger technology. The collaboration involves the filing of patents for a jointly owned revolutionary EV charger technology aimed at addressing the charging needs of GB/T Bharat DC 001 vehicles, which operate on sub-200V DC platforms.

- **Zypp Electric Collaborates With Porter Enterprise To Revolutionize Logistics Solutions In India**

Zypp Electric and Porter Enterprise have teamed up to revolutionize the logistics industry in India. By combining Porter's dedication to fulfilling 'a billion dreams' with Zypp's mission for a greener future, this partnership is reshaping the landscape of logistic solutions.



# Why Fast EV Chargers are DC?

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MD: Servotech Power Systems

With the EVs gaining momentum, fast charging plays a crucial role in overcoming range anxiety and making EVs a viable option for longer journeys. But have you ever wondered why all fast chargers utilize DC instead of AC? In order to understand this it is important to understand DC and AC power and what makes them different. AC electricity constantly changes direction, flowing back and forth at a specific frequency (usually 50 or 60 Hz). While AC is efficient for transmitting power over long distances due to minimal energy loss, it requires additional steps for battery charging. AC power needs to be converted to DC for battery charging through a process called rectification. Whereas DC electricity flows in a single, constant direction. It's the native language of batteries, as they store and deliver energy in DC form.

## The AC/DC Dilemma in EV Charging

While our homes use AC power, EV batteries operate on DC. This creates a need for conversion during charging. Here's where the limitations of AC come into play.

Firstly, AC to DC conversion incurs energy loss, reducing the overall efficiency of the charging system. This loss becomes more significant when dealing with high power levels involved in fast charging. Secondly, AC to DC conversion requires additional circuitry like transformers and rectifiers.

These components add bulk and complexity to the charging system, making them less ideal for the space-constrained environment of charging stations. Fast chargers overcome these limitations by utilizing DC power directly. Since DC is already in the same form as battery power, there's no need for conversion. The high-voltage DC from the charger connects directly to the battery, minimizing energy loss and maximizing charging speed.

Eliminating the AC to DC conversion stage leads to a simpler and more compact design for fast chargers. This translates to potentially lower costs and easier installation at charging stations.

Although fast chargers utilize DC, most EVs have an onboard AC/DC converter to handle Level 2 charging. This onboard converter allows EVs to charge from AC sources like home outlets.



EVs have Battery Management Systems (BMS) that regulate charging parameters for optimal battery health and safety. These systems interact with the fast charger to ensure safe and efficient charging within battery voltage and current limits.

## Why is DC Fast Charging better?



Fast chargers primarily utilize DC power for efficient and rapid charging, offering direct electricity flow to the battery for faster rates.



DC chargers are ideal for public stations and highway rest stops due to their high-power capabilities, reducing charging times significantly and enhancing accessibility.

They provide higher voltage and current levels, leading to quicker energy transfer and eliminating the need for onboard conversion. With less heat generation and scalability features, DC fast chargers offer cost-effective solutions for high-traffic areas and long-distance routes.

Standardization efforts ensure interoperability and compatibility across different EV models, promoting widespread adoption and ease of use. As battery technology advances, DC fast chargers remain essential for meeting the demands of electrified transportation and future mobility solutions.

*The dominance of DC in fast charging is set to continue due to its inherent efficiency and simplified design. As EV technology advances, we may see improvements in battery capacity and charging speeds, pushing the boundaries of fast charging capabilities. Additionally, research is ongoing into alternative fast-charging technologies, such as ultra-fast charging using even higher DC voltages, further streamlining the process and reducing charging times.*

*The reliance on DC in fast charging stems from the fundamental difference between how power is delivered (AC) and how it's stored in EV batteries (DC). By bypassing the conversion stage and delivering power directly in the form usable by batteries, DC fast charging achieves efficient and rapid charging, paving the way for a more convenient and future-proof EV experience.*

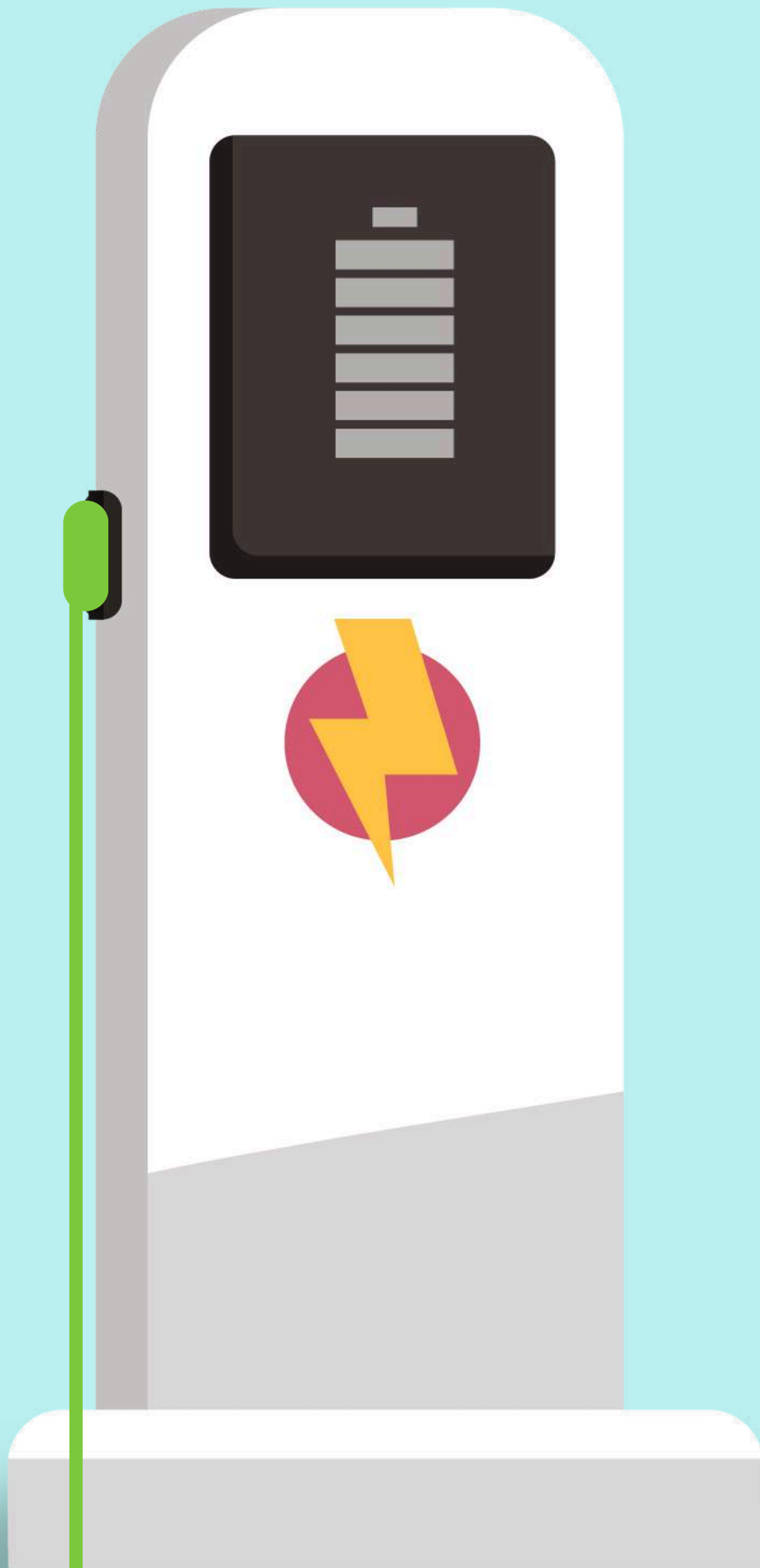




# Other EV Updates

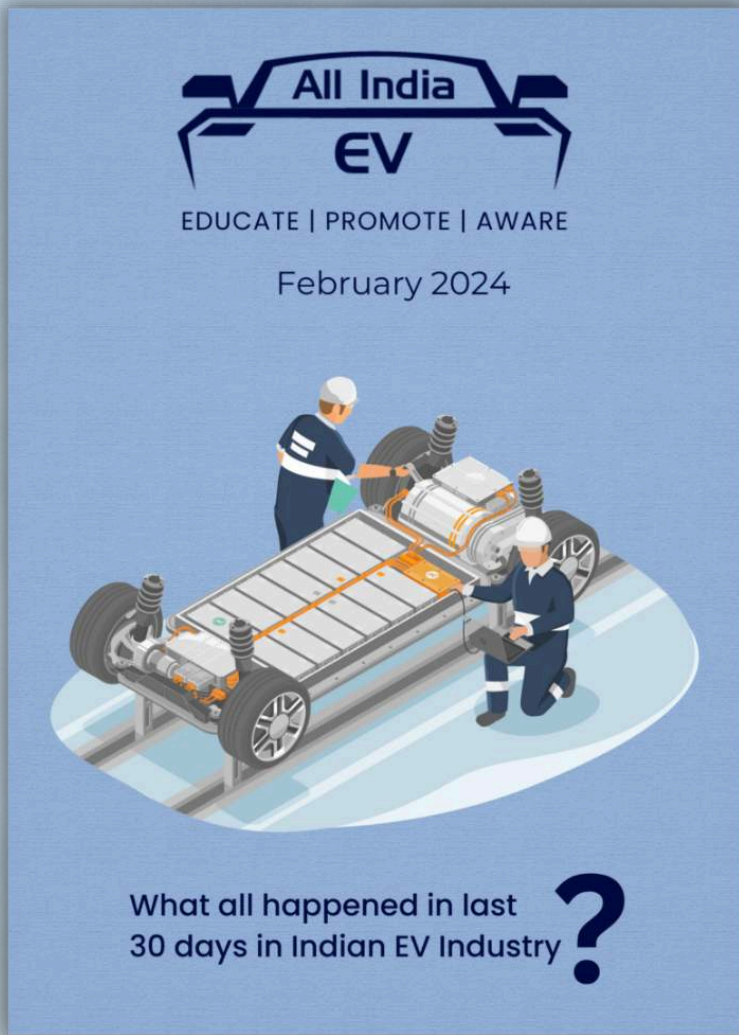
- Breaking Ground: **The ePlane Company** Electric Taxi Prototype Nears Completion
- **Chargeup's** Strategy To Enroll 100,000 Drivers And Expand Services To One Million Across 30 Cities
- **Sokudo Electric India** Ventures into Advanced R&D with New Motor Plant
- **ICRA** Projects Rs. 25,000 Crore Capex For EV Components In Next 3-4 Years
- **Bolt.Earth** Secures ARAI Certification For Advanced EV Chargers
- **EMotorad** Revolutionizes Electric Cycle Market with 370% Growth in India for FY24
- **Raptee Energy** Unveils First Production-Ready Electric Motorcycle, Marks Milestone in EV Industry
- **Wise Travel India Ltd** Expands Electric Fleet, Targets Sustainability Drive
- **Zypp Electric** Bolsters Leadership Team Amidst 3X Revenue Surge and Expansion into Hyderabad and Mumbai
- **DS Group** Implements Solar-Powered EV Charging Stations At Noida Base
- **Sona Comstar** Receives PLI Certification For Second Hub Wheel Motor For Electric Two-Wheelers
- **Tresa Motors** Secures Pre-Order of 1000 Electric Trucks from **JFK Transporters**
- **Log9 Materials** Receives BIS Certification for LTO Batteries, Ushering in New Era of Safety and Performance in Indian EV Industry



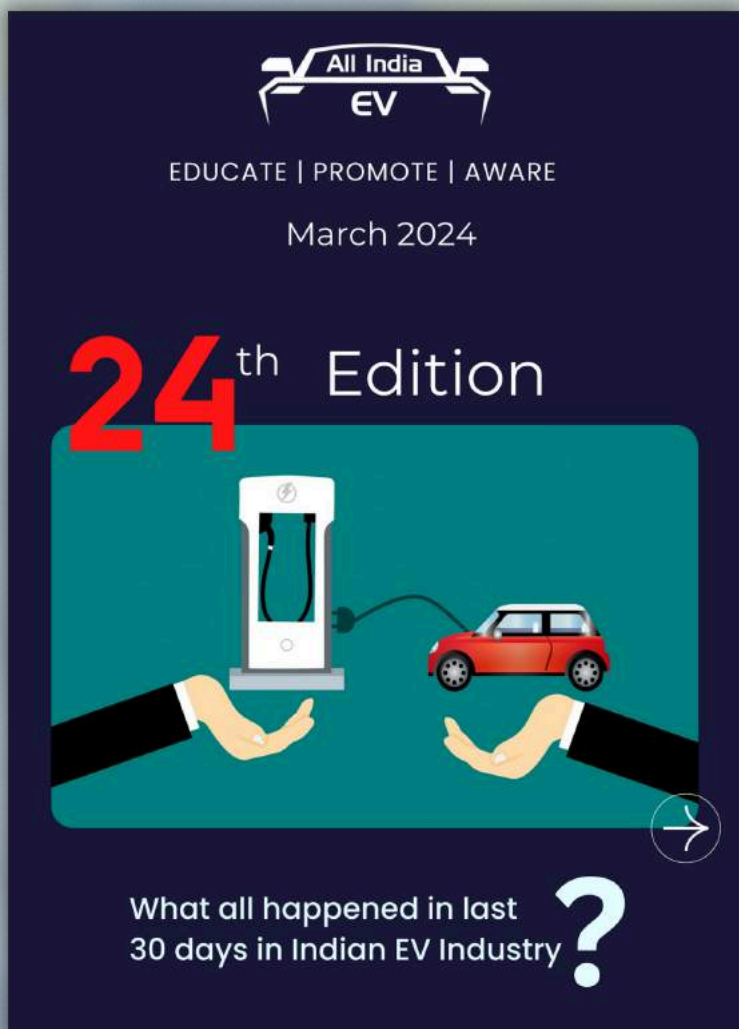




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