ALL INDIA EV

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BATTERY SPECIAL

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Battery Testing Norms by Indian Govt

A special panel was recently created by the Indian government to oversee the requirement for strict regulation of EV battery testing.

In the interest of public health and safety, safer batteries that lower the possibility of thermal runaway are the goal.

The panel has released a list of changes to the "Automotive Indian Standards" that are specific to EVs.

Safety Fuse

This fuse will protect your scooter, much like a trip-fuse in your home, which detects voltage fluctuations and abruptly shuts off the power to all of your appliances before they all blow up. It disengages the battery when it detects too much heat or current.

Cell Spacing

Cells when stacked with sufficient spacing in between each unit offer better thermal solitude. As a result, there are significantly fewer odds of one faulty battery triggering a chain reaction.

Battery Management System

The simple solution proposed here is to add four required sensors that detect any indication of heat or excessive current and quickly report it to the driver of the car via the instrument panel.

Click Here for Amendment 3 to AIS-156

In response to clarification sought by OEMs and battery manufacturers, **MoRTH released Amendment 3 to AIS-156 on Sept 27, 2022**. There have been a few changes from Amendment 2, and the timeline for Implementation is also split into 2 phases. The main changes are:

- The RFID tag requirement at pack level is removed.
- Time-based charge cut-off requirement in the charger is removed.
- At the cell level, the requirement of 5 charge/discharge cycles and data maintenance is reduced to 1 cycle.
- Requirements such as traceability of packs, additional safety fuse, protection against regenerative braking, cell-to-cell spacing, and microprocessor-based BMS with all protections will be effective in Phase-1 from 01-Dec-2022.
- Features such as Earth leakage detection charger, EMC testing of BMS as per AIS 004, IS 16893 testing from NABL accredited lab for cells, Thermal propagation test, Audio-visual warning in case of a thermal event, four temperature sensors in BMS, and Active Parallel Circuits are moved to Phase-2 which is effective from 31-Mar-2023.

Milestones

GODI India Manufactures India's First Ever 3000F High Power Supercapacitors

GODI India has developed a range of supercapacitor products that offer higher power delivery, minimal ESR (Equivalent Series Resistance), excellent energy density, better shock and vibration protection, and lakhs of charge-discharge cycles.

Tata Nexon EV MAX Makes A Landmark Entry To The India Book Of Records

Tata Motors announced that its electric SUV – Nexon EV MAX has made a landmark entry into the India Book of Records. The Nexon EV MAX successfully scaled the World's highest motorable road at Umling La pass, located in Ladakh at 19,024 Ft, above sea level.

Zypp Electric Completes 1.35 Million All-Electric Deliveries In August In Delhi-NCR

Zypp Electric has completed 1.35 Million deliveries in the month of August and has helped reduce 7.4 lakh kg of carbon emissions in the Delhi NCR region. Zypp currently operates with 5% female drivers in its fleet, who have been recruited via Zypp's special female rider employment programme.

Tata Power Sets Up 450+ EV Charging Points Across 350 National Highways

Tata Power has achieved a rare landmark of setting up 450+ EZ Charging points across 350 + national highways in the country. Tata Power EZ Charging Points are now present across major national highways

New Product Launch

Bolt Launches ‘BOLT LITE’ Electric Vehicle Charging Socket

Bolt Lite, a socket for EV charging that is compatible with all portable chargers.
Bolt Lite charging sockets can be used with all EVs, including electric two-, three-, and four-wheelers. It does not need any additional infrastructure and can be installed in less than 30 minutes.

Tata Motors Launches ‘Tiago.ev’ in hatch segment

Tata Motors today launched its first-ever EV offering in the hatch segment. Available in 5 colours – Teal Blue, Daytona Grey, Pristine White, Midnight Plum and Tropical Mist, the **Tiago.ev** will come in two battery and charging options including a 24kWh battery pack and a 19.2kWh battery pack.

Motovolt Mobility launched electric bike "URBN"

Motovolt Mobility launched the electric bike **URBN** in two versions. Company is now looking to establish satellite manufacturing units in order to be more accessible to the market.

Hero Lectro launches 3 new electric cycles

Hero Lectro launched 3 new electric cycles. The **C1** and **C5x** entry-level models from the C Series and the **F1** from F Series are the new models. The C1 and F1 have the battery integrated into the frame, while the C5x has a removable battery.

Vicktor, a new electric thee-wheeler by Omega Seiki Mobility

Omega Seiki Mobility launched **Vicktor** which is an electric three-wheeler. OSM Vicktor runs on a 20 kWh lithium-ion battery pack. It can travel up to 250 km per charge. Customers can choose between two versions of the electric three-wheeler: open or closed.

OTUA, the first cargo electric 3-wheeler by Dandera Ventures

Dandera Ventures, a sustainable mobility startup unveiled its first cargo electric three-wheeler, **OTUA**. The cargo EV weights 183 CC, and has a load carrying capacity of over 900 kg. It can travel 165 km on one charge and it is expandable to 300 km.

Mahindra launched XUV400 Electric SUV

With a speed of 100 kmph in just 8.3 seconds, **XUV400** is India's first passenger vehicle with the fastest acceleration.
A full charge delivers an anxiety-free range of 456 kilometers as per Indian driving cycle standards

Kinetic Green Launches ‘Zing HSS Electric Scooter

Kinetic Green has entered the high-speed scooter market with **Zing HSS** (after FAME II subsidies). After the Zing and Zoom electric scooters, which were launched last year, this will be Kinetic Green’s third e-scooter offering.

TI Clean Mobility Launches Electric Three-Wheeler, ‘Montra Electric

TI Clean Mobility launched the Montra Electric three-wheeler. It is a category-best 10 kWh battery pack that delivers a superior range of 197km with ARAI Certified and 155+/-5km in the typical range. It is also claimed to have an industry-best peak torque of 60 Nm, and a top speed of 55 kmph.

What is Battery Swapping?

Battery swapping allows EV owners to replace the discharged batteries with charged ones at the swap stations. When the battery is discharged, the owner can change it to a fully charged one.

This will address the problem of setting up charging stations and also reduce the range anxiety of drivers. Further, battery leasing can help EV owners save on the cost of purchasing a battery.

The service is less time-consuming and takes only a few minutes compared to charging at a battery station which could take hours. It also requires minimum infrastructure.

How does Battery Swapping work?

EV owner can visit any of the battery swapping station to swap the discharged battery with the charged battery. The EV owner have to pay a small payment for swapping.

The swapping station operator puts up charging stations and buys batteries in bulk.

- Customers can buy a vehicle without a battery. The battery can be leased from an Energy Operator.
- When the battery drains, it can be swapped with the fully charged battery. Customers would have to pay only for the electricity consumed.
- Similar to LPG cylinders, household owners never own a cylinder. EV users won't own the battery. Security deposit could be paid.
- The Energy Operator owns the batteries. It also setups charging stations to charge multiple batteries.

Indian Startups offering Battery Swapping Solutions

BatteryPool

Battery Pool, a tech stack based in Pune and launched by Ashwin Shankar in 2018, offers fleet operators real-time, actionable insight to help them overcome operational problems associated with operating EVs and increase vehicle utilisation.
The startup is implementing and creating hardware and software solutions that are technology-driven and designed to satisfy the requirements of EV fleet operators. It is a battery-neutral swapping station with IoT capabilities and an API-first software environment.

RACEnergy

Arun Sreyas and Gautham Maheswaran, both graduates of BITS Pilani, founded RACEnergy in Hyderabad, which creates inexpensive battery switching stations and swappable batteries for three-wheelers.

Additionally, it produces powerful drivetrains for three-wheeled vehicles.

Battery Smart

Battery Smart is a network of EV-battery swapping stations for electric three-wheel rickshaws and two-wheelers, and it is situated in Delhi. Battery Smart was formed in 2020 by Pulkit Khurana and Siddharth Sikka.

A fully charged battery can be exchanged for a drained battery at any of the business's partner switching stations. The startup provides superior Lithium-ion batteries to e-rickshaws on a subscription basis.

SUN Mobility

Ajay Goel, Ajay Maini, Uday Khemka, and Anant Badjatya founded the Bengaluru-based Sun Mobility in 2017, a cutting-edge technological platform that enables battery swapping solutions.

By isolating the battery from the car and lowering the initial cost of EVs, it provides interoperable smart mobility solutions for EVs, making them commercially viable.

Joint Ventures and Partnerships

Sun Mobility With AI Logistix To Deploy 500 EVs By March 2023 In Bangalore And Hyderabad

AI Logistix, a logistics firm, announced its collaboration with Sun Mobility in order to benefit from the latter's energy services. Sun Mobility and AI Logistix have partnered to provide 500 loaders and two-wheelers for the partnership. This will be in place until March 2023. Each month, they plan to add around 100 vehicles to their fleet.

Omega Seiki Mobility To Provide 5,000 Electric Cargo Three-Wheelers To Porter

According to Omega Seiki Mobility (OSM), the company will provide Porter with over 5,000 electric cargo-three-wheelers for last-mile delivery as part of a partnership with the logistics operator.
Porter will receive the vehicles by 2023. Porter already has around 1,000 EVs in its fleet and plans to increase that number five times by 2023.

EKA Mobility With goEgoNetwork To Set Up EV Charging Infrastructure

The partners will work together to provide a high-quality EV charging infrastructure for their customers and advanced charging stations through this partnership.
According to the agreement, goEgoNetwork is now the official provider of electric charging solutions for EKA's nine-meter buses.

E-Fill Electric Signs MoU With Chargebyte GmbH To Develop DC Fast Chargers For Electric Buses

E-Fill Electric, an EV tech startup, has announced it has signed an MoU with Chargebyte to develop its products and expand its business.
Both companies will also collaborate closely on the development of onboard chargers for passenger EVs with 4W.

- **Hero MotoCorp Partners With HPCL To Create EV Charging Infrastructure**
- **Hero Electric, Readily Mobility Will Provide 24 By 7 Service Assistant To B2B Fleet Partners**
- **Hero Electric Partners With Adani Electricity And VoltUp To Set Up EV Charging Stations In Mumbai**

Neuron Energy Announces Strategic Partnership with EV Giant KLB Komaki Pvt. Ltd.

Under this partnership, Neuron Energy will deliver 15000 battery packs per year, generating an approximate revenue of INR 50 crores annually with a monthly order value of INR 4 crores. The Bluetooth enabled batteries are not just one of the most innovative offerings of Neuron but also possess the advantage of being repaired remotely.

AMU Leasing, 3ev Industries and 3eco Systems collaborated to Deploy 1,000 3W EVs

3eco Systems has accumulated a large backlog of more than 1,000 EVs produced by 3ev Industries, as proof of the high performance, reliability, and scalability of the freight, passenger, and conversion kit platform. AMU Leasing Pvt Ltd has a large and efficient capability in vehicle finance, and has partnered with 3ev and 3eco to meet rapidly growing end-market demand with strong unit economics as operated by 3eco.

Chartered Bike and Grip Sign a $3 Million Lease Financing Partnership

Grip, India's has partnered with Chartered Bike to offer individual investors an opportunity to invest in sustainable and environment-friendly asset products. The partnership will also help Chartered Bike fastrack its deployment rate across geographies, help the company scale better, and have far more users in the country use a sustainable mode of last-mile commute.

Log9 Collaborated with Gravton Motors to Offer InstaCharge Battery Technology

Powered by Log9 batteries and a high-power motor, the Gravton RapidEV gets fully charged in 15 minutes, and offers a load carrying capacity of up to 250 kgs and gradeability of up to 22 degrees. In addition, it also comes with a long life of 10+ years, best-in-class safety, and proven reliability throughout the complete life of the vehicle, as well as a class-leading 5 years and unlimited kms warranty on both on the vehicle and its battery.

Flipkart Partners With Magenta Mobility To Deploy 400 Electric Cargo Vehicles

Flipkart joins forces with Magenta Mobility to deploy electric vehicles for its last-mile transportation. According to the company, Magenta Mobility has entered the Delhi NCR region and will provide around 400 electric cargo vehicles for the Flipkart fleet.

Amplus Solar Expands Its Clean Mobility Fleet With Mahindra Electric's Zor Grand

Amplus Solar's electric mobility vertical has signed an MoU with Mahindra Electric, India's No. 1 Electric 3-wheeler company, to procure their Zor Grand, a brand-new breakthrough electric vehicle.
The agreement signifies a major step forward in Amplus Solar's mission to advance clean mobility solutions to its customers.

Neuron Energy Partners With EVTRIC Motors To Supply 12,000 EV Batteries

Neuron Energy announced its partnership with EVTRIC Motors.
Neuron Energy will supply 12,000 batteries per year through this partnership. EVTRIC Motors will receive ongoing support from Neuron Energy for its battery pack needs through this long-term strategic partnership.

Evolution of Batteries

Batteries have been around since at least 250 BC, and possibly even earlier. One may argue that the development of batteries altered the entire trajectory of human civilization.

The battery first appeared in western culture in 250 BC. Its official name is Baghdad Battery.

However, Rishi Agastya is credited as the creator of portable batteries in the Indian Sanatan literature.

1786: Electricity in Frog Legs

1800: Voltaic Pile

1820: The Daniell Cell Battery

1859: Lead Acid Batteries

1866: A Carbon-Zinc Battery

1886: Carl Gassner's Leclanche Cell

1899: Nickel-Cadmium Battery

1903: The Edison Battery

1955: Alkaline Batteries

1912: Lithium and Lithium-Ion Batteries

- In 1980, John Goodenough's discovered the LiCoO2 cathode.
- In 1982, Rachid Yazami discovered graphite anode.
- IN 1985, Asahi Chemical's developed a rechargeable lithium battery prototype.

The lithium-ion battery was first commercialized by Sony in 1991.

Indian Lithium Battery Manufacturers

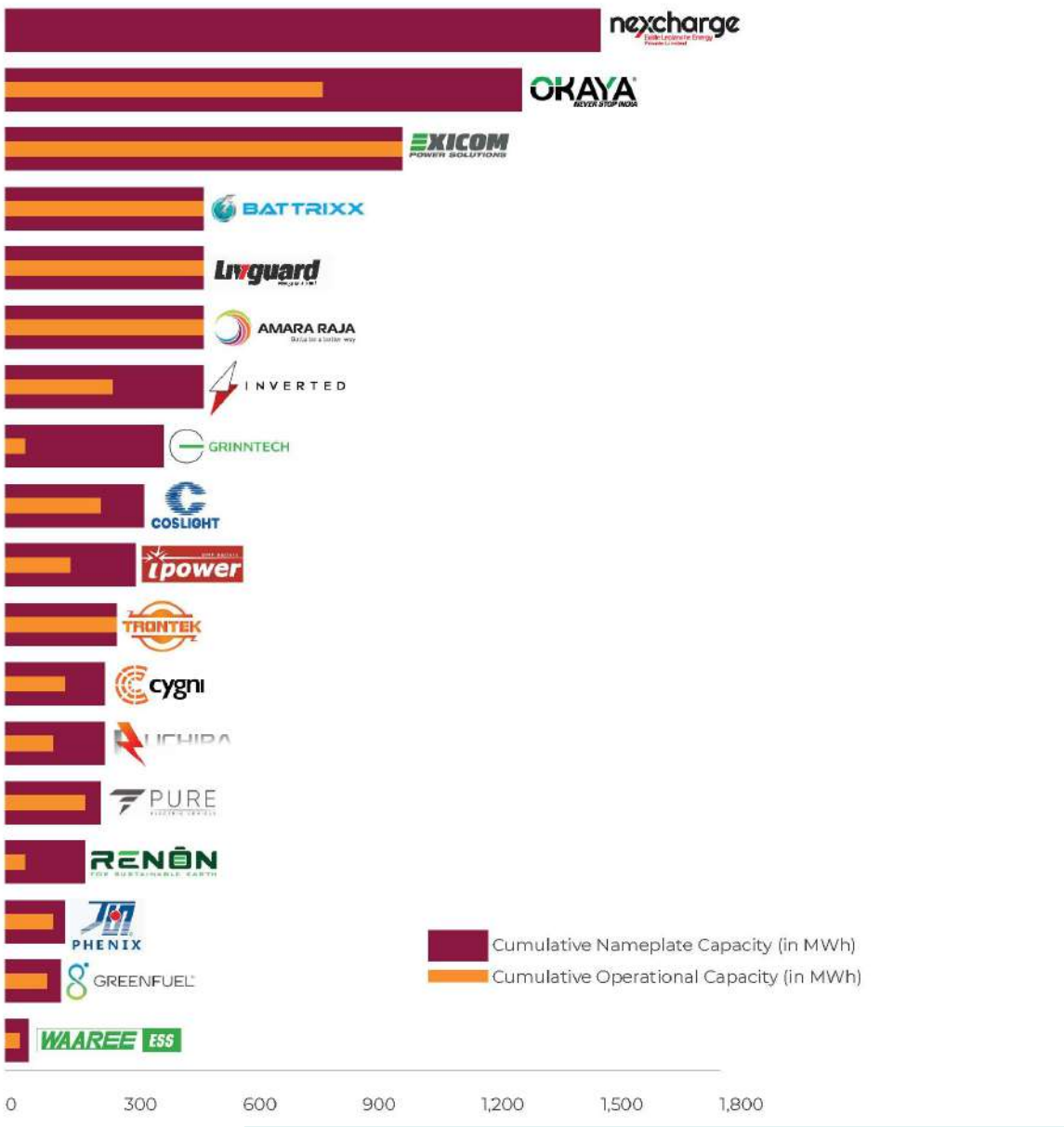

Image from JMK Research

Future of Batteries

Cell Schematic	Pros	Cons
Lithium sulphur 	• Higher specific energy and power discharge compared with conventional LiBs • High tolerance for extreme temperatures • Uses low-cost and easily disposable input material	• Low cycle life and longevity

Applications	Major Developments
• Truck and bus electrification	• Industry expects LiS technology evolution for specialist, high-performance applications. • Research groups at Monash University and University of Michigan have reported advancements at laboratory scale in membrane/interlayer materials that can allow higher cycle life.[16]

Cell Schematic	Pros	Cons
Solid state 	• High thermal and impact safety because liquid electrolyte is replaced by a solid • Reduced dendrite growth issues extend service lifetime • High specific energy and low cost	• Cycle life highly dependent on specific anode-cathode mix (currently less than 1,000 cycles) • Not commercially viable currently; expected to reach mass market in 3–5 years

Applications	Major Developments
• Long-range EVs	• Samsung SDI announced the construction of a solid-state pilot line in South Korea; Nissan plans to mass-produce proprietary solid-state batteries by 2028 at $75/kWh pack targets.[17] • Solid Power is already producing 20 Ah solid-state batteries in low-volume batches.[18] • Volkswagen may be planning for EVs with solid-state batteries as soon as 2025, using QuantumScape's technology.[19]

Cell Schematic	Pros	Cons
Lithium carbon 	• Combines benefits of traditional LiBs with capacitors—good energy/power density and fast recharging • Promises low carbon footprint • Low cost, relatively abundant materials • Not susceptible to thermal runaway;[iv] does not need external cooling system	• Technology in very early stage, with limited number of makers

Applications	Major Developments
• EVs (especially 2-/3-wheelers) where fast charging can add value	• Allotrope Energy announced this technology for long-range and fast-charging use in last-mile delivery segment (electric 2-wheelers) in partnership with Mahle Powertrain.[20]

Cell Schematic	Pros	Cons
Semi-solid 	• Design eliminates the need for binder material, making the cell cheaper and lightweight • Storage capacity not limited by battery size (as in flow batteries) • Promises safer performance than incumbent battery technologies	• Technology not expected to be commercialised before 2025 • Currently faces issues with electrode separators, R&D in solid electrolyte material with sufficient electrical conductivity

Applications	Major Developments
• Can be tailored for specific applications (e.g., stationary storage, EVs)	• 24M announced the advanced semi-solid manufacturing process in 2015 and has since struck strategic partnerships with Kyocera (residential storage solutions) and Volkswagen, as well as Lucas TVS to set up production capacity in India.[21]

Cell Schematic	Pros	Cons
Lithium air 	• Very high theoretical energy density • Uses abundant, low-cost materials for electrodes, offering lower bill of materials	• Technology still in R&D stage, currently limited by low efficiency and poor cycle life

Applications	Major Developments
• Residential storage, EVs	• Technology is still in R&D phase (advanced materials research)

Other Updates

Gulf Oil India Launches EV Fluids to Support Electric Mobility

Hero Electric To Invest Rs 1,200 Crore In Greenfield Facility In Rajasthan

Mallawa Ventures Plans To Invest USD 1 Billion In Tamil Nadu To Produce Hydrogen-Powered Electric Buses By 2030

REIL Issues Tender To Set Up 738 EV Charging Stations Across India

Hero Electric, **DSEU** Partners For EV Skill Development Program

Mangalam Industrial Finance Ltd Signs MOU With **WardWizard Innovations & Mobility Ltd** To Finance Their Low, High-Speed Electric Vehicles

Kinetic Green Collaborates With **Tata Capital** To Provide Electric Two-Wheeler Loans

EV Startup **Esmito** Raises Rs 10 Crore In Seed Round Led By Unicorn India Ventures

Ola Electric To Open 200 Experience Stores By March Across The Country

Saera Electric Auto Opens A New Manufacturing Facility In Bhiwadi, Rajasthan

Delhi Government To Install More Than 5000 Kerbside Charging Stations In 3 Years

Basavaraj Bommai Distributes Electric 2-Wheelers To Sanitation Workers

WardWizard Innovations And Mobility To Set Up Global Research And Development Headquarter In Singapore

Magna Enters Micro-Mobility Market By Investing $77 Million In Yulu

A Group Of Financiers Launches ‘Electric Mobility Financiers Association Of India’ For EV Financing

Tork Motors Introduces ‘PIT CREW’ – A Complete Service And Sales Solution On Wheels

ALL INDIA EV

All India EV is an independent platform developed & managed by a few EV enthusiasts with the prime objective of educating people about the EV ecosystem, making them aware about what's all happening in the EV industry & promoting the EV industry

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To collaborate with us, you can reach us on business@allindiaev.com

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