

EV STORY

ELECTRIC MOBILITY IN INDIA

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Eclectic People Behind India's Electric Mobility



There are a few people amongst us who are passionate about travelling the second, demanding mile. Their vitality is not in their ability to persist but the potential to start over. In the growing EV industry, such personalities are beginning to gain ground.

In this inaugural E-Magazine of EV Story, we bring you such eclectic and electrifying personalities who are driving the promising future of mobility. These are people who are not predicting the future, they are inventing it.

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Born Electric Range From M&M

The proof of the pudding is in the eating. It is when the British International Investment's senior officials got to see Mahindra Born Electric range that convinced the team to invest \$250 million along with like-for-like amount by Mahindra into the new entity called EV Co. at a valuation of Rs 70,070 crore (\$9 billion).

M&M will introduce eight new SUV EVs by 2027, of which 5 will be unveiled on 15th August, all developed at Mahindra Advanced Design Europe (MADE) studio in Oxfordshire.

Sharing his views on the Born Electric range during the launch of Scorpio-N, **Aneesh Shah, Group Managing Director & CEO** had said that M&M will be looking to create a unique niche for its Born Electric range and

its pricing too will make a big value proposition. "It will act as a disruptor amongst the offerings made by its competitors," he said.

Engaging 100

All eSUVs of M&M get an interesting 100 added to their names. The famous five include the electric version of the XUV700, getting one leg up in its moniker as XUV800 with a 2,750mm wheelbase based on a skateboard platform taken from its Volkswagen collaboration to also include the batteries and a driving range of over 500kms.

Coupe versions could be called XUV900 and XUV1000 with the XUV 400 to be shown this September and it makes a debut by the first half of 2023 followed by the XUV 800 which is expected to start production in 2024.



Ola's Commuter Segment Scooter & Electric Car I-day Launch



This Independence day, Ola Electric will be introducing its 'Janta' electric scooter that will be priced between Rs 80,000 to Rs 90,000 to arrest its decline in the e2w space where it stands at the No4 slot.

Ola's CEO & Founder, Bhavish Aggarwal, has already teased the arrival of its maiden sports luxury four-door coupe sedan that will have a skateboard architecture and is expected to be priced in the Rs 10 lakh range when introduced by 2024

The Softbank-funded EV maker had managed to rake in a record 1, 50,000 bookings for its Ola S1 Pro; its numbers for July were down to 3859 as compared to 5,874 two-wheelers in June. Ola Electric sold 9,258 electric scooters in May 2022, data from FADA (Federation

of Automobile Dealers Association) and the government's Vahan portal shows.

Ola which had once market leadership has ceded the space to current market leader Hero Electric followed by Okinawa, and Greaves lead Ampere Motors.

The EV maker needs to urgently amp up its service delivery network and add more products at the bottom of the pyramid as the mass market segment within Rs 65,000 to 90,000 is driving electric two-wheeler electric sales with the largest push coming from the rural areas.

Ola has set up a future factory to manufacture the world's largest and most advanced cell research and development facilities with more than 165 'unique and cutting-edge' laboratory equipment to cover all aspects of cell-related R&D.

EV EXPO 2022 Gets Thumbs Up From All Stakeholders

The recently concluded 15th EV EXPO 2022 showcased the latest and technologically advanced, pollution-free 2, 3 & 4 wheeled e-vehicles, parts and accessories, charging solutions, and technology from around 100 exhibitors.

The expo addressed comprehensive market information, and business opportunities, creating a platform for networking amongst all stakeholders such as EV manufacturers, Technology developers, Battery manufacturers, Charging infrastructure partners, Policymakers and regulators from

Government, Private Organisations, Industry Associations, etc.

The Expo was inaugurated by **Minister of State, Ministry of Micro, Small and Medium Enterprises, Bhanu Pratap Singh Verma** at Pragati Maidan. A one-day conference on 'India's EV Sector – Roadmap for Global Leadership' was organised and conducted by **General (Dr.) V K Singh, Minister of State for Road Transport & Highways, Krishan Pal Gurjar, Minister of State for Heavy Industries**, and attended by **Parmeshwaran Iyer, CEO, NITI Aayog**.



Tata Motors 10 new EVs By 2027

Post unveiling of the Avinya concept & Curvv EV in the first half of 2022, Tata Motors is planning to launch 10 new electric cars over the next 5 years.

Tata Motors currently has close to 80 percent market share in passenger EVs as it retails Tigor EV and Nexon EV in the country. Tata also has the XPRES-T electric sedan with two range options – 213km and 165km (ARAI certified range under test conditions).

While Tigor is available at a starting price of Rs 12.49 lakh, the Nexon electric SUV is offered at a starting price of Rs 14.99 lakh. The company has recently launched the long-range version of Nexon EV, which is called Nexon EV MAX. It is claimed to offer a range of 437kms.

In the coming months, Tata Motors will launch the electrified

version of Altroz premium hatchback in the country. Tata Motors is also working on an all-new electric micro-SUV based on the Punch SUV. The Tata Punch EV is expected to be priced as low as Rs 10 lakh.

The Curvv Coupe SUV, when launched in 2024, is expected to offer a range of over 400kms. The Avinya concept-based Born Electric model, scheduled to be launched in 2025 is based on the GEN 3 architecture that supports multiple body styles.

Tata Motors is also preparing to bring back the Sierra nameplate in the market. The company showcased the Sierra concept at the 2020 Auto Expo. The production version of the Sierra Electric Vehicle will be based on Tata's new SIGMA platform heavily modified for electrification.



Simple One To Start Deliveries From This September



Bengaluru-based Simple Energy is all set to start deliveries of its Simple One by this September. **Co-founder Suhaj Rajkumar** told **EV Story** that the firm is working on an affordable scooter that it plans to showcase very shortly. Rajkumar added that they are eyeing the motorcycle market too with an electric car also in the works.

To fund its expansion plans, the startup raised around Rs 170 crore last year and is planning to raise 100 million dollars in the near term. In the next 12-15 months, the hunt for the next 500 million dollars will begin to fund the expansion of the product portfolio, dealers, sales, and service networks.

Simple Energy has signed

an MoU with the Tamil Nadu government for an investment of up to Rs 2,500 crore to construct the largest fund electric two-wheeler manufacturing plant in Dharmapuri in Karnataka.

As part of Phase 1, the first plant of 200,000 square feet is being constructed near Shoolagiri (Hosur) and will have a capacity of up to a million units on an annual basis.

Rajkumar said the unique part of the plant is that Simple Energy will also invite vendor partners to set up their shops inside the newer larger facility. "We are also talking to multiple cell manufacturers and we are open to joint R&D for our future designs," he said.

Sun Mobility Earns ARAI Certification as Battery Swapping Provider

The Chetan Maini-founded battery swapping major, Sun Mobility has emerged as India's first Automotive Research Association of India (ARAI) certified battery swapping provider to get its swapping station equipment validated to the latest standards.

With the government's battery swapping policy yet to be notified, currently, there is no set benchmark for such stations.

Sun Mobility also received

certification for its swappable battery pack as per the latest applicable standard AIS 156 from ARAI, which the company claims makes its battery pack one of the safest in India.

All safety and electrical tests, such as battery pack overcharge, over-discharge, fire resistance, short circuit, mechanical and thermal shock, vibration, and drop test, were performed at ARAI by the AIS 156 Standard.



THE EV PEOPLE

Here are the people from the EV world who have heard the sacred call of transformation. And they have already set the benchmark, while inviting the world to an era of endless innovation...

Triumph On The ROADS

NITIN GADKARI
MINISTER FOR ROAD
TRANSPORT &
HIGHWAYS, GoI



It is said that accomplishments are the ornaments of life. In that perspective Nitin Gadkari own many jewels in his crown. In 2014, when he became the Minister of Road Transport and Highways, Gadkari quickly proved that 'a vision is a joke until the first man accomplishes it. Once realised, it becomes commonplace'.

But Gadkari does not sit on achieved laurels. He gave renewed speed to construction of highways in every nook and cranny of the country.

Highway construction pace post 2019 was 36 km per day in 2020 and Gadkari aims to take it to 68 kms per day with a target of 25000 kms in 2022-23.

It has been his dynamic approach

to the EV industry that under Faster Adoption and Manufacturing of Electric Vehicles (FAME) Phase-II scheme, 2,877 public EV charging stations have been sanctioned in 68 cities and 1,576 EV charging stations across 9 expressways and 16 highways.

Always one to encourage the EV industry, he had said, 'Indian automakers are more than capable of producing the world's best electric vehicles and the country has a plethora of young, skilled designers who are improving their craft'.

Gadkari also believes that before the end of 2025, India's auto sector will become the 'world's number one manufacturer hub and will be exporting to the entire world'.

Amitabh Kant, the former CEO of National Institution for Transforming India (NITI) Aayog is a man for whom aspiration is discontent. No wonder, he made a difference when he was Chairman of the Empowered Committee on the transformation of Aspirational Districts Programme of the Government of India, which was launched by the Prime Minister of India in 2018.

And in his new responsibility as India's Sherpa at G-20, Amitabh will have to carry on from his highly successful stint as the poster man of India's EV revolution who took on existing auto OEMs to show them the mirror that there is no future for companies that do not go green.

He strongly felt that sunrise sectors comprising renewables,

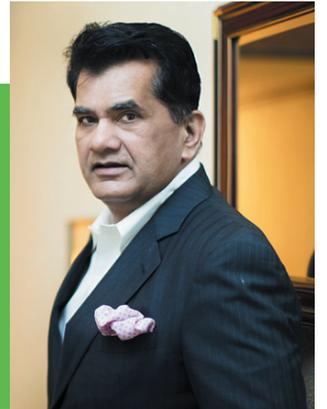
battery storage, clean mobility, electrolyzers and green hydrogen would grow faster, adding that with India's commitment at the Glasgow summit, the country would require focus on these technologies.

So much so that the former head of the apex public policy think tank of the Government of India got himself a white-coloured Tata Nexon EV, which serves as his daily commute.

At NITI Aayog, he helped the government to draft the policy for PLI scheme incentivising EV production and even facilitating the development of the country's EV ecosystem. At the same time, he encouraged the industry to work on its R&D capabilities for use of alternative fuels like ethanol, bio-LNG, and green hydrogen.

Believer of GREEN

AMITABH KANT
FORMER CEO
NITI AAYOG



Aiming at
VALUE
MAHUA ACHARYA
CEO & MD
CESL

Heading Convergence Energy Services (CESL), Mahua believes that excellence must above all conform with realistic standards. It is but obvious because she is at the center of redefining the future of public transport in India. A state-run energy transition company, it was recently contracted to procure 50,000 electric buses across India worth over 10 billion dollars.

CESLs latest tender is aimed to support India's mission to decarbonise public transportation and achieve net zero emissions.

CESL is instituted under the Ministry of Power, New and Renewable energy is bringing various stakeholders together

to enable a large-scale switch to electric mobility in the public domain by aggregating demand for electric buses from various state transport undertakings to meet the country's net-zero emissions goals.

She has been focusing on enhancing the overall EV usage experience, address range anxiety, and hence, encourage EV adoption. According to her, the government is planning to include crucial details about the charging stations on the app including their availability, charger types, and tariffs. The app is expected to go live very shortly.

Acharya is already in the process of collating information from the private sector for the super app.

Wizard of Great POWER

**NAVEEN MUNJAL
MANAGING DIRECTOR
HERO ELECTRIC**



Naveen Munjal, the MD of Hero Electric, India's largest two-wheeler EV-maker is highly optimistic about the future. So much so that he has taken the battle pitting his product against the ICE variants at the entry level mass market which forms more than 70% of India's two wheeler sales.

His entry level scooter, Optima, is strategically priced at Rs 65,000 and is making rapid strides with a days charge of 1.5 units at a minuscule Rs 20 insuring EV patrons from the vagaries of petrol prices.

With this aggressive pricing strategy and lower total cost of

ownership, Naveen's company was at the pole position in July with 35% increase in sales and overall 35-40% market share unseating Okinawa, pegged at No. 2.

Hero Electrics' latest greenfield plant in Ludhiana is expected to have an annual production capacity of 200,000 vehicles and increase to touch 1 million units in the next three years.

Besides EVs, Naveen is also looking at global business interests in bicycles, healthcare & rehabilitation products, real estate and fitness & sports equipment that he manages in the capacity as Group Managing Director.

For Girish Wagh, purpose has always been the keystone in his temple of achievements. And in his sustained determination to achieve, purpose seems to have evolved as an invincible power towards the march to success.

In his illustrious career of 29 years with Tata Motors, Girish has held several senior roles with increasing and complex responsibilities across Passenger Vehicle and Commercial Vehicle Business Units. Leading teams across multiple functions, he successfully delivered game changing projects including the Tata ACE - Mini Truck and the new generation cars including Nano, Bolt, Zest, Tiago,

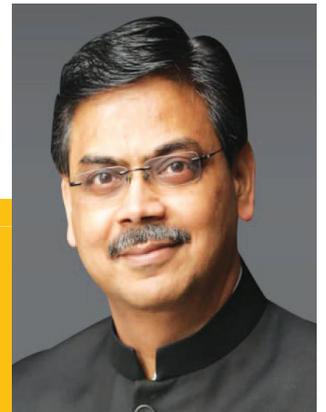
Hexa and Tigor.

And with focus on electrification of passenger and cargo, his Group is expected to unveil 10 EVs including SUVs by 2027, while the third-generation EV architecture Curvv and Avinya concepts sits beautifully with its existing product line that has market leadership with the Nexon EV, Tigor EV and fleet-only XPres-T EV.

The company's acquisition of the Sanand plant for Rs 726 crore will boost its annual production to 300,000 units in the first phase with an additional capex of 1,20,000 units adjacent to its existing facility aided by rich supplier ecosystem for seamless transition.

Determined SOUL

**GIRISH WAGH
EXECUTIVE DIRECTOR
TATA MOTORS**



Her Impulse to

SOAR

**SUMAN MISHRA
CHIEF EXECUTIVE
MAHINDRA ELECTRIC**

Beethoven once said, "The barriers are not erected which can say to aspiring talents and industry, 'Thus far and no farther'". Suman is one such talent in the EV world. And she makes no little plans.

Having been associated with the Mahindra Group since 2015, she has been hitching the ambition wagon to ride to higher stars. Deservedly, the MBA from University of Michigan, Ross School of Business and a Computer Engineer from NTU Singapore, was appointed Suman as the Chief Executive of Mahindra Electric Mobility Ltd (MEML) last year on August 14.

Under Suman's able tutelage, Mahindra Electric Mobility Limited (MEML) has achieved a key milestone

of 50,000 electric 3-wheeler sales from a humble start with its debut vehicle, e-Alfa Mini in 2017. MEPL's Treo range has received the maximum awards for indigenous powertrain and a Li-ion battery pack with a real world driving range of 130 km on a full charge with 0 to 100 per cent in 3 hours and 50 minutes through a 16V charging socket.

Prior to Mahindra, Suman worked with Cipla and McKinsey. She joined the Mahindra Group in 2015 as Senior Vice President, Group Strategy Office.

She was recognised as Economic Times 40 under 40 business leaders and Economic Times Woman Ahead in 2019. She is part of the Group Corporate Office Leadership Team and Group Diversity Committee.

Chetan believed from the beginning of his career that dreams are the seedlings of realities. So, when he was completing his masters degree in mechanical engineering at Stanford University after obtaining a bachelor's degree in mechanical engineering at the University of Michigan in 1992, he was already dreaming lofty dreams.

The Founder of Reva, one of the first in India's electrification space, is now looking to further help e-commerce players by installing battery swapping stations inside the warehouses of Amazon India,

pan India. According to him, the company wants to make refuelling electric vehicles 'faster, cheaper and more convenient' for fleet operators.

Chetan is bullish on swapping as a service and on the back of the government's recent policy, has deployed over 115 swap points in 18 cities, powering over 40 million km and over 1.8 million swaps.

Their recent partnership with Lets Transport will see over 2,000 vehicles contributing to the last-mile delivery segment. The immediate plan is to roll out 100 electric three-wheeler cargo vehicles presently deployed across Delhi-NCR and Bangalore.



In a Class of His

OWN

**CHETAN MAINI
CO-FOUNDER
SUN MOBILITY**



Man with a Midas

TOUCH

**UDAY NARANG
FOUNDER & CHAIRMAN
OMEGA SEIKI MOBILITY**

After running a successful hedge fund outfit in the United States for three decades, Uday decided to listen to his heart, a calling which poked him to try, change, and go on creating, endlessly. He returned to India and found his mission to redefine sustainable mobility.

Eventually floating Omega Seiki Mobility (OSM) Pvt. Ltd, his strong belief has been that his firm will disrupt the Indian mobility landscape with ground-breaking but affordable electric vehicles. His focus is now on developing commercial EVs primarily deployed with e-commerce for last-mile delivery.

His company's first vehicle, Rage+, was indigenously designed and developed in his manufacturing facility in Faridabad. Launched in February 2020, Rage+ is claimed to be India's first smart electric cargo three-wheeler.

Recently, he announced a strategic partnership with Agri Junction to deploy more than 10,000 electric two and three-wheeler vehicles in rural markets by FY2023. Uday has been growing his product lineup and manufacturing footprint rapidly. His OEM has two-, three- and four-wheelers in its product portfolio.

Venkateswara Pradeep Karumuru is a shining example of someone recognising his course by discovering the paths that stray from it. With over 22 years of experience in business development, execution of projects and general management of EPC & aviation business, Pradeep was enamoured by the EV world.

The Chairman and Managing Director of Olectra Greentech Limited has led the EV manufacturing firm to achieve its goals by believing in his instincts and keeping objectives slightly out of reach to be of maximum value. And his achievements speak.

Recently, Olectra, a group company of Megha Engineering & Infrastructures Limited, bagged a huge order from Telangana State Road Transport Corporation to supply 300 electric buses. The value of the order is approximately ₹500 crore.

And in terms of revenue, he has ensured the figures bring in joy. Olectra reported standalone revenue from operations of Rs 304.7 crore for the quarter ended 30th June 2022, as against Rs 41.2 crore recorded in the corresponding period of the previous year, registering a year-on-year growth of 640.4 per cent.

Master in Matters of GOALS

**VENKATESWARA
PRADEEP KARUMURU
CMD
OLECTRA GREENTECH**



Taking Ideas for a

RIDE

**BHAVISH AGGARWAL
CO-FOUNDER AND CEO
OLA CABS & OLA ELECTRIC**



After a bachelor's degree in computer science and engineering at Indian Institute of Technology Bombay in 2008, Bhavish had started to engage himself in pursuit of path breaking ideas. Starting his career with Microsoft, he used his intellectual instrument to break into phenomena. Ola Cabs was launched in 2011.

And as a good idea is like a brilliant diamond having many facets, Bhavish knew the potential EV will have on his brainchild.

He recently confirmed that Ola Electric is going to launch

a new electric vehicle on India's 75th Independence Day. The CEO teased the launch of its upcoming EV online. His company captioned the new product as the 'greenest EV' it has ever made.

Bhavish has already made public his intention for Ola to launch its first electric car in the next 2-3 years to be produced at a new 4W factory to be built.

This year, Bhavish announced the first indigenously developed Li-ion battery cell.

Ola S1 and S1 Pro scooters were launched in India in August last year.

Rajeev heads the Indian subsidiary of China's largest automaker SAIC, MG Motor India which is looking at expanding its presence at the lower end of the market by launching a sub-Rs 20-lakh electric vehicle later next year.

His firm operates one manufacturing plant in Halol, Gujarat with a capacity of 80,000 units per year and was previously owned by General Motors India. MG Motor India has invested more than ₹2,000 crore in revamping the 178 acre facility after its takeover from General Motors.

"We are working on finalising the

details of a battery assembly facility this year, which is likely to go on stream next year," he had announced.

Ever since he started his journey in India in 2018, driven by the vision of CASE (Connected, Autonomous, Shared, and Electric) mobility, Rajeev's firm brings to the table cutting-edge augmented experiences across-the-board within the automobile vertical. His company has introduced several 'firsts' to the Indian automotive industry with the first Internet SUV – MG Hector, first Pure Electric Internet SUV – MG ZS EV, and first Autonomous (Level 1) Premium SUV – MG Gloster.



Keen Eye on COSTS

**RAJEEV CHABA
PRESIDENT AND MD
MG MOTOR INDIA**

Optimist with a PLAN

**JAY GALLA
CHAIRMAN & MD
AMARA RAJA BATTERIES LTD**



Last year, the board of Amara Raja Batteries Ltd. (ARBL) decided to rejig the company board and announced 'Energy and Mobility' as the strategic focus. It announced expansion of the Lead Acid Batteries business and the establishment of a New Energy SBU encompassing Lithium cell and battery pack, EV chargers, Energy Storage Systems, Advanced Home Energy Solutions and related products and services.

And spearheading this new development was Jayadev Galla, popular as Jay Galla. The Vice-Chairman who took over

as Chairman had said, "After a careful review of the global business opportunities, the ARBL Board has decided to future-proof our business by repositioning ARBL as an Energy and Mobility player," he said.

Along with the new energy SBU, Amara Raja Batteries posted a net profit of ₹131.45 crore in the quarter ended June 30, 2022, as against ₹124 crore in the same quarter last year. During the period, the company registered revenues of ₹2,620 crore as against ₹1,886 crore in the corresponding period last year.

Not many people come close to the league of those who possess both courage and perseverance, in equal measure.

The combination has a magical talisman to overcome difficulties, and Mahesh surely has both traits instilled in him.

With over 25 years of experience in mobility, Mahesh joined Switch from Mahindra Electric where he was Managing Director and CEO.

Under his leadership, Mahindra Electric launched six new electric vehicles including 3-wheeler and 4-wheeler commercial vehicles,

as well as the innovative software platform NEMO. One of the most prestigious projects under his leadership was India's first monocoque SUV, the XUV500.

He has also been instrumental in shaping future mobility policy in India by delivering electric TCO solutions through groundbreaking initiatives in passenger vehicles, commercial fleets, and last mile mobility. Mahesh actively contributed to various EV committees of both central and state governments, CII and FICCI.

For Him, Courage is a

HABIT

**MAHESH BABU
CEO, SWITCH
MOBILITY, INDIA**



Getting the Facts

RIGHT

**SUBIR CHARABORTY
MD & CEO,
EXIDE INDUSTRIES**



Facts are stubborn things, and Subir loves that very nature of all his business facts. Strategically planning every move with a keen eye for detail, the mechanical engineer from IIT, Madras and PGDM from IIM, Calcutta, he has grown with Exide Industries from 1996, serving as a director on the board and deputy managing director of the company since May 1, 2019.

After his elevation to MD & CEO, under his leadership, Exide Industries has seen an 81 per cent growth in standalone net profit for the quarter ended June 30, aided by a growth in top-line despite high input cost inflation.

And keeping a close watch on Exide's wholly owned subsidiary, Exide Energy Solutions, Subir oversaw procurement of 80 acres of land in Karnataka to set up its planned lithium-ion cell manufacturing project.

Exide joined hands with SVOLT Energy Technology Co Ltd (SVOLT) in the new scheme of things of lithium-ion manufacturing.

The land will be used to set up a greenfield multi-gigawatt li-ion battery cell manufacturing facility for the new-age electric mobility and stationary application businesses in India.

A mechanical engineering graduate, Diego got his start in the industry with Fiat Automobiles in Torino, Italy. From there, he joined motorcycle company Moto Guzzi, which was acquired by the Piaggio Group in 2003. Having spent about five years in a purchase environment, in 2012, he was Global Purchasing Head for the entire Piaggio Group. In 2017, Diego was invited to head up the Indian subsidiary on the condition that he transform the company's public image in the country.

The opportunity to head Piaggio Vehicles, to become Chairman and Managing Director of an important company of 3,000 people with a

US\$500 million revenue, was huge. But Diego did not fret. He believed that if excellence has the potential to bring enough joy, it is only reasonable to focus on higher excellence. And he did.

Under his watchful eye, Piaggio India launched the all new Ape NXT+ passenger 3 wheeler. The CNG variant offers fuel efficiency up to 50 km/kg CNG. "The new Apé NXT+ is designed and developed in India for the Indian market and will also be exported to markets overseas. With the launch of this Apé NXT+ we aim to further strengthen our position in the alternate fuel segment space," he had said during the launch.

Excellence for Sheer

JOY

**DIEGO GRAFFI
CHAIRMAN & MD
PIAGGIO VEHICLES**





‘We have taken huge strides towards New Gen Vehicles Based on *Skateboard Architecture*’

One of the early adopters of EV in India, Tata Motors has studied the evolving market and is devising strategies to get hold of a big chunk. Anand Kulkarni, Product line Head – Passenger Electric Vehicles Business Unit, Tata Motors speaks to **Aditi Kelkar** from EV Story about the road ahead.

ICE equivalents. The current certified ranges vary from 250km to 430km+.

We showcased the concept curve in April 2022 which is based on the Gen 2 architecture. The Gen 2 approach aims to improve Gen 1 architectures while retaining the opportunity for the ICE vehicle developments as well. The design philosophy for Gen 2 is “Less is More”. Hence in this concept curve, modern SUV presents simplicity in its complexity.

We have taken a large stride towards a new generation of vehicles based on “Skateboard Architecture”. This was exhibited in the latest unveil of Avinya which is a Gen 3 EV. Gen 3 has the ability to incorporate ADAS.

Q What have been the major consumer trends as captured by Tata Motors, in EV passenger vehicles?

Interesting question! EV sales growth is exceeding our expectations. We have sold over 31k EVs to date. Our quarterly sales surged with around 9280 cars sold in Q1.

We also sold the highest ever monthly units, over 4k in July 2022. We have a large database of customer profiles, habits, usage methods etc. Most of our consumers are based in metros, in the age range of 35-40 years, with above average income.

Q Can you give our readers an overview of the EV platform strategies devised by Tata Motors?

For the last 4 years, we’re on a mission to mainstream EV technology in India. This started off with the 2017 EESL contract for 10k vehicles. So, from a small beginning to taking on a completely new approach on building pure EVs like the recently showcased concept Avinya, we’ve come a long way. Not only are we the only ones to have such a big EV portfolio, but we also have rich data of how consumers in India tend to utilise electric vehicles and how they meet their use cases. That helps us to devise electric-specific strategies while evolving our platforms. As early adopters of EV in India we are working on multiple strategies, such as number of body styles and new technologies. We aim to launch 10 new EVs in the country by 2025.



Q Please elaborate on Tata Motors’ Gen1, Gen2 and Gen3 architectures.

Our electrification drive started with the Gen 1 cars, where we electrified some of our existing products and checked its suitability, adoption rates, customer requirements and effectiveness. We built on this feedback information and started evolving this architecture into Gen 2. We have also unveiled the Gen 3 architecture with Avinya.

These 3 EV architectures will help us drive in a range of EVs across various price points. The flexibility of the architecture allows for efficient scaling of the process. We have introduced products like the Nexon EV in January 2020, followed by the Tigor EV, Citron Platform and recently an enhanced variant of the Nexon EV with larger battery and newer technologies called Nexon EV Max. All these are based on Gen 1 architecture, derived essentially from their

They typically have an EV as their second or third car and have a fixed commute within their city or at most 2 nearby cities. They are tech savvy and well-informed individuals with exposure to Indian and global trends.

The customer cars have clocked approximately 320 million ‘Green’ km between them. We clock over 2 million km daily. This will have a significant impact on pollution, oil imports, fatigue-free easy drives. ♦

‘IC (chips) revolutionised last century, now too it is about IC - *India and China*’

Dr. Yashodhan Gokhale is a true battery specialist and passionate about battery chemistries! He started Octillion India operations in October 2016 and by June 2022, he has been leading innovation as **Vice-President at Kalyani Powertrain.**

The Vice President of the 100 per cent subsidiary of Bharat Forge speaks to **Aditi Kelkar** about alternatives for lithium ion and latest battery design technologies.



Q Today Lithium battery energy storage is the most cost-effective, flexible solution to solve grid issues. Do you think in the long-term we will require broader range of technologies that can provide long duration energy storage where lithium ion may not be suitable?

That's a good question. Lithium-ion batteries have their pros and cons. After the Russia Ukraine war, the prices have shot up by more than 30% in China. There are some other technologies apart from Lithium ion such as Sodium, Hydrogen fuel cell which give a good alternate solution for grid storage application. Other technologies such as Vanadium Redox flow are also there but they will take time to mature. At the end of the day, battery technology should be cost effective, sustainable and safe. People are trying and in the next 2-3 years we should get more mature solutions. Lithium-ion technology was developed in the 1980s and has only now matured as a technology. People keep developing new materials for anode and cathode. So, I think for grid storage, hydrogen and sodium can be a good answer.

Q Tell us more about the research focus on battery design.

One of the new battery research design technologies is the cell-to-pack technology. Although there are challenges, there are good improvements like almost 10% reduction in weight, the batteries can be chassis-mounted, etc. The whole automotive

industry is in favour of chassis-mounted batteries due to better weight balance and weight ratio while driving the car. Sleekly designed battery packs are the way forward as it improves the energy density by 10-15% as compared to normal batteries where people go from cell to module to pack which is managed by an external intelligent battery management system. These packs can comply with different certifications such as USABC, ARAI ICAT in India with AIS 038, 048 new standards which take care of shock and vibration, thermal runaway issues and such.

Q What are your views on India's foray into EV?

The last century was revolutionised by IC (integrated circuits). This century is also about IC (India and China). At the moment, the dominance of C (China) is more than that of I (India). When India becomes truly dominant, we can push for Make in India. There are many good startups maturing into good companies such as Ather Energy in the EV domain. At some point we have to create a truly Atmanirbhar Bharat. Big companies in India make complex products such as BMS (Battery Management System) for say Volkswagen or Audi. It is high time that they start making it for the Indian OEMs.

My message to everyone is to buy Electric since it is lighter on the carbon footprint and it's our responsibility to pass on a safer environment to the next generation. Don't worry about the range because that will be

resolved in due time. Although the prices are high currently, the overall ROI is very competitive and lucrative. So, go green, go Electric! ♦





'Aeris has contributed to India's goal of being *carbon neutral*'

Dr. Rishi Mohan Bhatnagar is an established leader in starting strategic initiatives, executing and profitably scaling. Currently, as the **Board Member and President - Aeris Communications India**, a pioneer in IoT/M2M Technologies, he is leading the Aeris business in the Indian subcontinent, MEA & the APAC region. He speaks to **Aditi Kelkar** from **EV Story** about the direction Aeris is taking in the Electric Vehicle space

Q Can you tell our readers how Aeris's IoT solutions are helping fuel the EV revolution in India?

Since the year 2018, Aeris has been helping multiple EV OEMs transform their standard EV into a smart and connected product! Aeris-powered smart vehicles don't just act as an accessory to the consumers, but also help OEMs in having detailed insight on how their product is performing on road.

By supporting the electric vehicle ecosystem with connected technologies and clocking 120 million kilometres of green driving, Aeris, India has contributed to India's goal of being carbon neutral, saving 9100 metric tonnes of CO₂.

This translates to about six lakh trees. I believe that the tech industry will revolutionise the future of services and this is only possible if the IoT-driven solutions are made cost-effective.

Q While EV adoption is gaining traction, there are safety concerns bothering many. How do

you think Aeris is filling this gap?

We introduced the Aeris Aertrak Platform, which offers connected telemetry to 'everything moving'. The single dashboard view of all the vehicles can be monitored on a mobile device or a desktop computer from any location. Fleet

an unsuspecting owner.

Fortunately, his eScooter was already equipped with Aeris AerTrak, which resulted in the eScooter's ignition being turned off, making it impossible for the thief to move the vehicle any further.

“EV is the new sunrise space. India has joined the global EV30@30 initiative, which aims to switch at least 30% of vehicle sales to electric vehicles by 2030.”

owners and logistics managers can track and monitor their vehicles using our state-of-the-art track & trace technology.

AerTrak analyzes the data gathered in order to enhance vehicle performance, usage, safety, and security. AerTrak saved the day for one of the scooter's owners in Odisha, where a female thief posing as a doctor stole an EeVe Xeniaa electric scooter from

Aeris was the first one to launch India's First IoT-based connected eRickshaw Solution. This solution tracked and recovered the sole source of livelihood of an Electric Rickshaw owner.

Q What would you want to leave the readers with on account of the 75th Independence Day and with India's EV revolution?

EV is the new sunrise space. India has joined the global EV30@30 initiative, which aims to switch at least 30% of vehicle sales to electric vehicles by 2030. With the government's help, India's EV market has risen significantly, fuelled by the 2/3-wheeler segment, with major contribution coming from the EV cars.

Low fuel and operating costs, increased demand for first and last-mile connectivity, and the need to achieve carbon neutrality are all driving large-scale adoption of EV.

While the regulatory support and technology advancements would certainly lead to better TCO economics for EV customers, this development is going to significantly impact manufacturers across the automotive value chain.

Accepting this shift, exploring expansion opportunities to venture into newer areas of value addition and reinventing the ways to manage revenue and profit, automotive players can be a part of the success story of e-mobility in India. ♦



Vilas Tank is a business leader having 25 years of global experience in overall business transformation, product development, commercialization, strategy, sales, marketing & manufacturing as well as startups. The founder and managing director of Aventose Energy speaks to Aditi Kelkar about his electric scooter, research areas and his views on mass adoption of EVs in India

‘We have been focusing on all ecosystem parameters to support mass adoption of EVs’



Q Tell us more about your upcoming maiden electric scooter, Aventose S110?

Aventose S110 is a rugged electric 2-wheeler indigenously developed for Indian use conditions in tier 1, 2 & 3 cities. It will come with max speed of 60 kmph and range of 100 km in eco mode. Its design is result of detailed voice of customer (VOC) and targets 85% of Indian 2-wheeler market which is currently dominated by petrol 100cc -125cc two-wheelers. Due to our obsessive customer focus and many differentiating factors, Aventose S110 will be able to have very high adoption rate.

Q Tell us about the research focus areas at Aventose that would support the EV adoption in India.

We are continuously working on component, software as well as system level research areas to push the boundaries and bring our electric vehicles at par with the ICE counterparts. But building a good electric product by itself may not help achieve mass adoption. In order to achieve mass adoption, we will have to also create an ecosystem which allows same user convenience as currently enjoyed by the ICE vehicle users. This includes ease of refuelling, reselling, dealership presence, servicing, spare parts availability, financing, insurance etc. Apart from product level development we have been focusing on all the ecosystem parameters to support mass adoption of Aventose vehicles in India.

Q According to you, what are the infrastructure and resources required

to support mass adoption of EV in India?

There are 3 low hanging fruit categories which can be targeted to ‘initiate’ mass adoption of EV in India. By targeting these 3 categories we can achieve higher mass adoption without investing too much on the charging infrastructure ‘upfront’. All these should be slow, mostly overnight charging solutions which do not put burden on the grid during the day when the requirement is already high.

First category of two and three wheelers don’t require very big batteries and hence can work with portable battery solutions which can be charged off board mostly at homes. Charging off board will increase the adoption of this category as the dependency on day charging at public fixed charging and swapping stations is reduced. Having said that it does not mean that we do not focus on public fixed charging and swapping solution. These will also develop parallelly but may take time to spread infrastructure all over India.

Second low hanging fruit category is passenger car segment. For mass adoption of this category charging points need to be made mandatory at parking lots of apartments, office buildings, shopping centres, restaurants, petrol pumps etc. This will not require new infrastructure but update of existing one with slow charging.

Last category is city buses for which charging stations can be made at all bus depots for overnight charging.

Needless to say that above or any other mass adoption plan will only work if government lays down very strict battery safety policy and ramps up the electricity supply and setup of efficient grid network. Focus also should be on slow overnight charging as fast daytime charging may put load on already stressed electric supply. ♦



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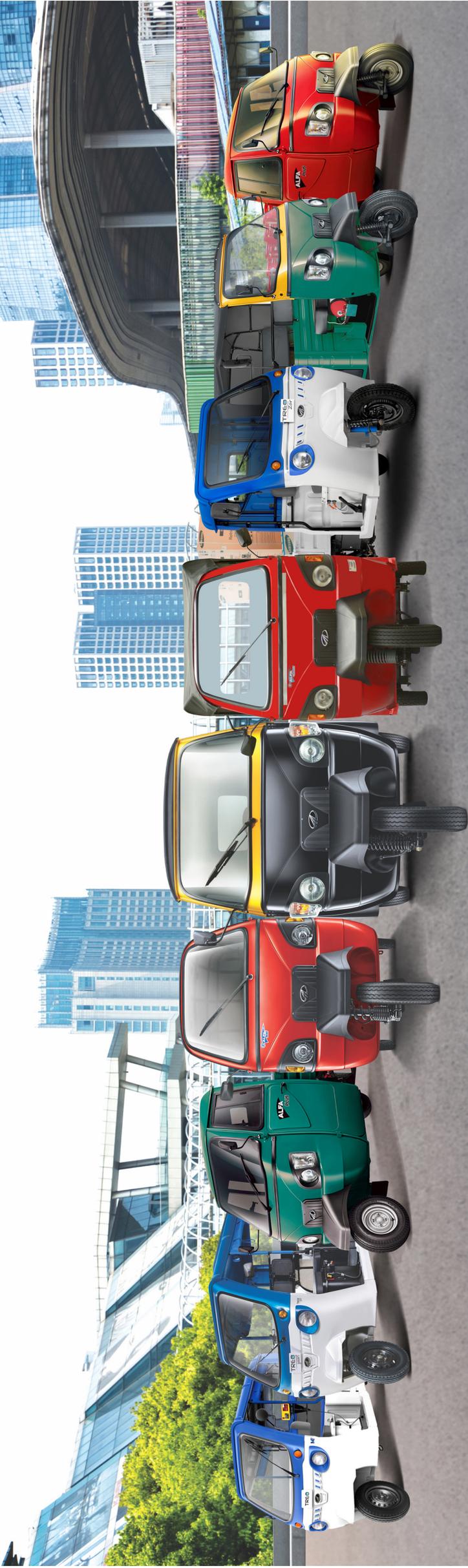
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