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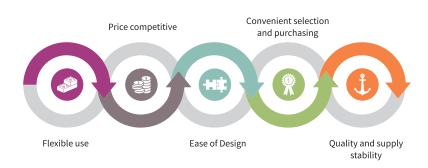
StrongIRFET™ 2 Technology in 80/100V

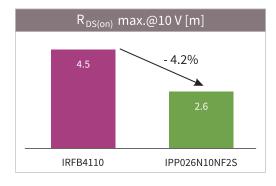
The Power MOSFET addressing a broad range of applications

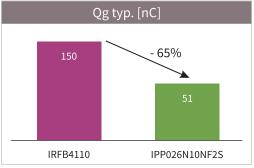
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"80V and 100V targeting a broad range of applications such as motor drives and battery management systems for LEV application"



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1 NEW PRODUCT LAUNCHES

Table 1.1: India Launches – October 2022

Product	Vehicle type	Battery specifications	Other specifications	Price
Ola S1 Air	E2W (E-scooter)	• 2.5kWh Lithium-ion	 Range – 101 km Top Speed – 85 km/hr Charging Time – 4 hr 30 minutes 	INR84,999 (Ex-Showroom)
Baaz Bikes	E2W (E-scooter)	_	 Range – 100 km Top Speed – 25 km/hr 	INR35,000 (Ex-Showroom) (Excluding Battery Price)
VAAN Electric Moto Urban Sport	E2W (E-Bicycle)	• 48V/7.5Ah Lithium-ion	 Range – 60 km Top Speed – 25 km/hr 	INR59,999
VAAN Electric Moto Urban Sport Pro	E2W (E-Bicycle)	• 48V/7.5Ah Lithium-ion	 Range – 60 km Top Speed – 25 km/hr 	INR69,000
Hero MotoCorp VIDA V1 Pro	E2W (E-scooter)	• 3.94kWh Lithium-ion NMC	 Range – 165 km Top Speed – 80 km/hr 	INR1,76,000 (Ex- Showroom) (Excluding Subsidies)
Hero MotoCorp VIDA V1 Max	E2W (E-scooter)	• 3.44kWh Lithium-ion	 Range – 143 km Top Speed – 80 km/hr 	INR1,99,000 (Ex- Showroom) (Excluding Subsidies)
Komaki VENICE ECO	E2W (E-scooter)	 3kWh Lithium Ferro Phosphate (LiPO4) 	• Range – 90-120 km	INR79,000 (Ex-Showroom)
Erisha E-Mobility E-Superior	E3W (Cargo)	• 51.2V Lithium-ion	• Range – 120 km	INR3,89,000
Erisha E-Mobility E- Supreme	E3W (Cargo)	• 51.2V Lithium-ion	• Range – 120-140 km	INR4,09,000
Erisha E-Mobility E-Smart	E3W (Passenger)	• 51.2V Lithium-ion	• Range – 120 km	INR3,87,000
BYD Atto 3	E-Car	• 60.48kWh BYD Blade Battery (LFP)	 Range – 420 km Top Speed – 160 km/h Charging Time – 50 minutes (with 80 kW DC fast charger) 	INR30,00,000 (Ex-Showroom)
MG Motor ZS EV (New)	E-Car	• 50.3kWh	• Range – 461 km	INR22,58,000



Upcoming Launches

Aarya Automobiles to introduce e-bike 'Commander' by Dec

Gujarat-based electric two-wheeler manufacturer Aarya Automobiles is coming up with its high-end electric bike 'Commander'. With a 3,000 W/72 V motor, capacity of 3.7kWh Li-ion battery, and a charging capacity of 4-5 hours, the e-bike will be available in 8 colour variants and is expected to hit the Indian market by the end of 2022. Aarya was founded in 2019 with its headquarters and manufacturing unit in Surat.

After EQS, the carmaker is gearing up to launch the allelectric Mercedes-Benz EQB in India by this year

Mercedes-Benz is all set to drive in its third electric vehicle to India. The EQB seven-seater electric SUV will be launched in the country towards the end of this year.

- The Mercedes-Benz EQB is powered by a 66.7 kWh battery pack that Mercedes-Benz claims a WLTP range of 407 km, while in the real world, expect a drop of ~30 per cent. The battery pack can be charged to 80 per cent in 32 minutes using a DC fast charger, while an 11 kW AC charger takes 5 hours 45 minutes to charge fully.
- The Mercedes-Benz EQB India launch is expected to happen sometime in December, with deliveries starting early next year. The Mercedes-Benz EQB can be expected to carry a price tag of INRR80 lakh ex-showroom.

TVS-backed Ultraviolette to launch premium electric bike F77 next month

Ultraviolette Automotive Pvt Ltd, which is backed by TVS Motor Company, will launch its F77 hyperbike on November 24, 2022. To be available in variants – Airstrike, Shadow, and Laser – the highperformance bike is expected to be priced in the range of INR3.5 lakh to INR4.2 lakh. The e-motorcycle is projected to deliver a range of 200 km on a single charge, accelerate from zero to 60 km/h in just 2.9 seconds, and attain a top speed of up to 140 km/h.

This upcoming Made-in-India EV will offer 402 bhp of power and 500-km range

Pravaig Dynamics, based out of Bengaluru, has been preparing



to launch its first electric car in India for some time. This EV can generate up to 402 bhp of maximum power. The SUV will come with a driving range of more than 500 kms on a single charge and will be able to recharge up to 80 per cent within 30 minutes using fast charging options. The electric SUV also claims to have top speed of more than 200 kmph.



2 EV SALES TRENDS

The overall EV sales in October 2022 increased m-o-m by 28.1% to reach 1,19,889 units. In addition, there was a y-o-y leap of more than 200%.



Fig 2.1: Registered EV Sales Trend in India (October 2021–October 2022)

Source: Vahan Dashboard, Company Press Releases, JMK Research Note: Sales figures represent EVs registered across 1,340 RTOs in 34 states/ UTs.

Feb-22

Mar-22

Apr-22

1ay-22

Jun-22

Jul-22

Aug-22

Oct-22

Sep-22

54,557

49,672

Jan-22

50.866

Dec-21

60,000

40,000

20,000

0

38,684

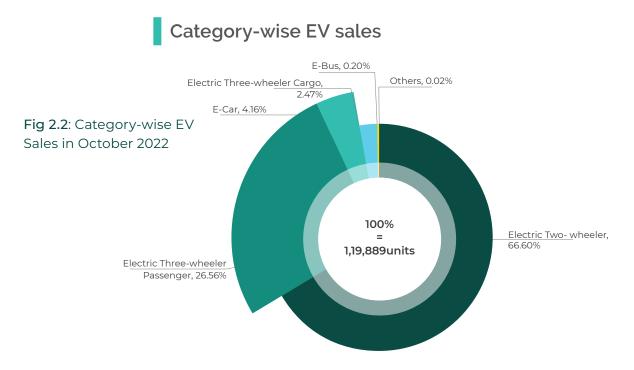
Oct-21

42,055

Nov-2

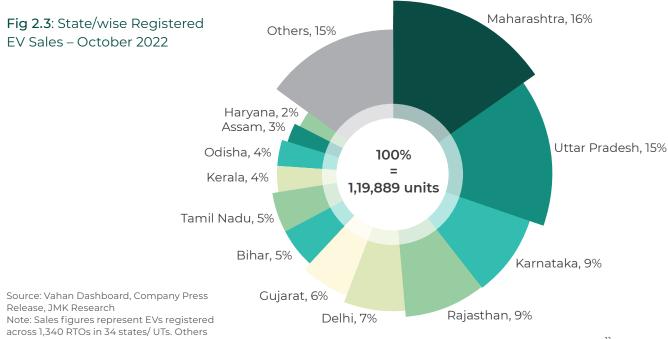
As depicted in the figure below, EV registrations in October 2022 were driven by electric two-wheelers and passenger-type electric three-wheelers, which together accounted for 93.16% of total registrations in the month. The shares of these categories were followed by E-Cars (4.16%), cargo-type electric three-wheelers (2.47%), and so on.





Source: Vahan Dashboard, Company Press Release, JMK Research Note: Sales figures represent EVs registered across 1,340 RTOs in 34 states/ UTs; Others include fork-lifts and goods carriers.

Among the states and UTs, Maharashtra accounted for the highest EV registration this month witnessing an m-o-m rise in sales of more than 44%. This was followed by Uttar Pradesh accounting for 15% of overall EV sales. Rajasthan and Karnataka both attained third spot this month with 9% shares each. This was followed by Delhi (7%), Gujarat (6%), and Bihar (5%). Delhi witnessed a rise of more than 69% in registrations this month. The highest rise in registrations however was witnessed by Chhattisgarh (82%) this month.



include Chhattisgarh, Andhra Pradesh, Uttarakhand, Punjab, and 18 other states/UTs.



High-Speed Electric Two-Wheeler (HS-E2W)

The overall HS E2W sales in the country in October 2022 stood at 79,844 units, signifying an increase of more than 50% m-o-m and more than 3x y-o-y leap in registrations. The Top 10 players accounted for 93% of the total registrations witnessed in the month of October 2022.



Fig 2.4: High-Speed E2W Sales Trend

Source: Vahan Dashboard, JMK Research

Note: Sales figures represent only high-range E2W (Top speed > 25 kmph) registered across 1,340 RTOs in 34 states/ UTs.

Ola Electric retained its top slot this month as well, becoming the first ever E2W manufacturer in India to dispatch 20,000 units in October. The festive season accompanied by the opening of physical stores primarily led to this surge in sales. Okinawa retained its number two position while Hero Electric further slid to number four slot. Ampere jumped to number three position witnessing an increase in more than 50% of sales from the previous month. Jitendra New EV-Tech made a surprise entry to the top 10 club, replacing Revolt.



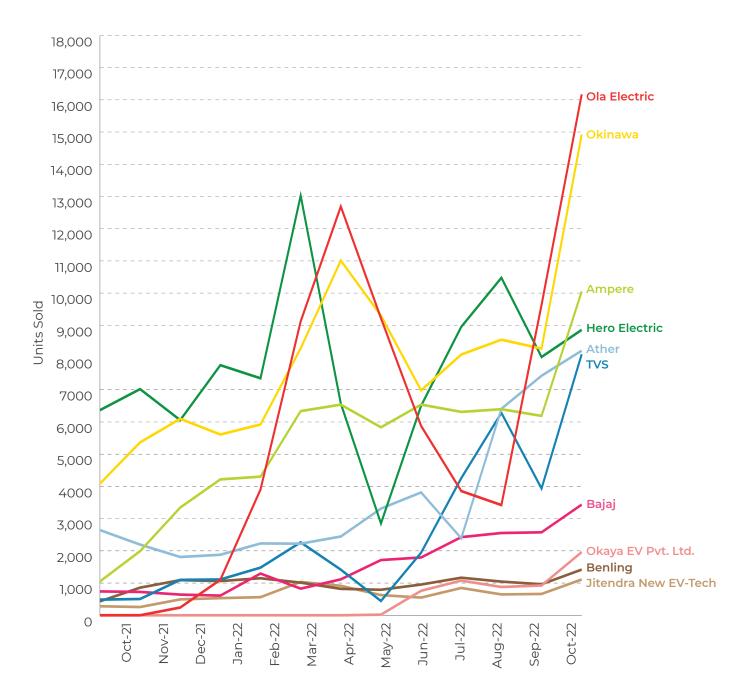


Fig 2.5: Top High-Speed E2W Players in October 2022

Source: Vahan Dashboard, Company Filings, JMK Research Note: Sales figures represent only high-range E2W (Top speed > 25 kmph) registered across 1,340 RTOs in 34 states/ UTs. Others include Revolt, Pure EV, GoGreen E-mobility Private Limited, MEW Electricals Ltd (BGauss), KLB KOMAKI, and 59 other players.



Electric Three-Wheeler (E3W)

The sales of registered E3Ws passenger and cargo-type in October 2022 stood at 31,837 units and 2,959 units respectively, signifying a m-o-m decline of 4.82% for E3W - Passenger and rise of 10.12% for E3W - Cargo. The decline in sales of E3W - Passenger this month was primarily on account of reduced sales of E-Rickshaw (P).



Fig 2.6: Sales Trend of E3W – Passenger (Left) and E3W - Cargo (Right)

Source: Vahan Dashboard, JMK Research

Note: Sales figures represent E3Ws registered across 1,340 RTOs in 34 states/ UTs; E3W (Passenger and Cargo) sales shown in the figure takes into account both e-rickshaw and three-wheeler classes as categorized in the Vahan dashboard.



The cumulative sales of top 7 electric 3-wheeler players across passenger and cargo segments in October 2022 accounted for 37.15% share of the entire E3W market. YC Electric Vehicle replaced Mahindra for the top position, accounting for ~9% share of the entire E3W market. Mahindra came at second position and accounted for a share of 8.91%. This was followed by Saera Electric Auto (5.47%), Dilli Electric (4.50%), Champion Poly Plast (3.72%), Mini Metro EV LLP (3.44%), and Piaggio Vehicles Pvt. Ltd. (2.47%). Piaggio made its entry to the top 7 club this month for the first time, replacing Unique International.

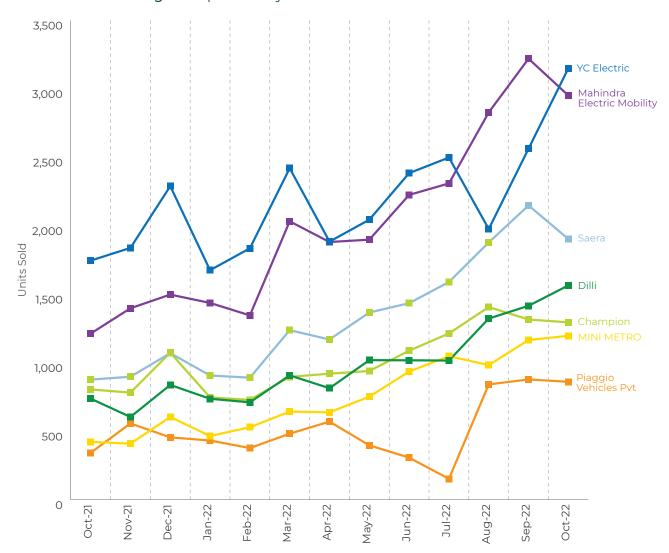


Fig 2.7: Top E3W Players in October 2022

Source: Vahan Dashboard, JMK Research

Note: Others made up 62.85% of the E3W market in October 2022; sales figures for players are inclusive of both cargo and passenger offerings; Sales figures represent E3Ws registered across 1,340 RTOs in 34 states/ UTs; E3W (Passenger and Cargo) sales shown in the figure takes into account both e-rickshaw and three-wheeler classes as categorized in the Vahan dashboard.



Electric cars (E-cars)

The total sales of E-cars in October 2022 stood at ~4,984 units, witnessing a m-o-m rise of 17.6% however a y-o-y surge of more than 2.8 times in registrations. Tata Motors has been driving the E-car sales this month as well. The Company accounted for more than 80% share of the total E-car registrations. Other than Tata Motors and MG Motor, Hyundai was the only other car manufacturer that witnessed a slight increase in its E-car sales this month. Kia Motors witnessed sales of its E-cars for the first time this month.

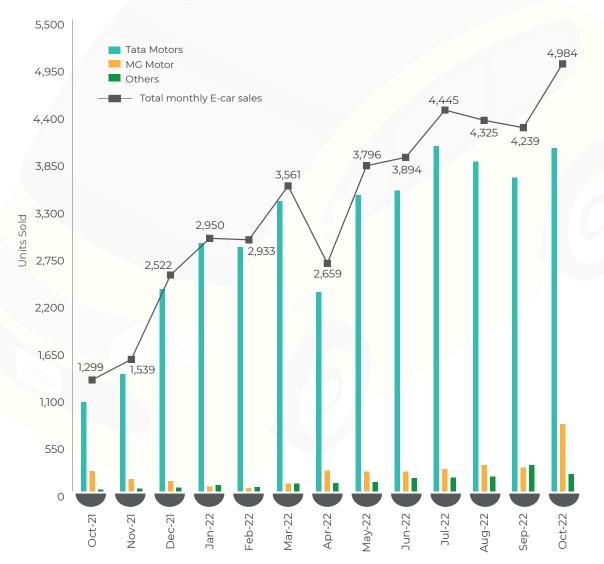


Fig 2.8: Player-wise E-car sales trend

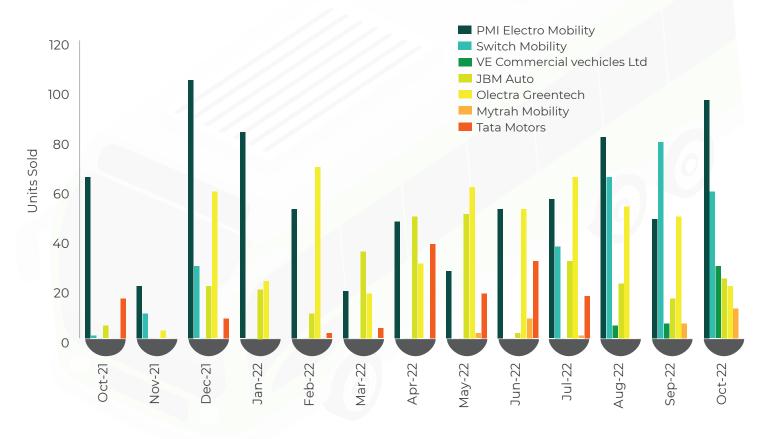
Source: Vahan Dashboard, Company Press Release, JMK Research Note: Sales figures represent E-cars registered across 1,340 RTOs in 34 states/ UTs; Others include Hyundai, BYD, Audi, Mahindra & Mahindra, Mercedes-Benz, BMW, Jaguar, KIA Motors, and Porsche.



Electric buses (E-buses)

The cumulative sales of E-buses in October 2022 stood at 241 units, with a m-o-m rise of 18.14% and a y-o-y surge of more than 170%. This month's sales were driven by PMI Electro Mobility (39.83%) followed by Switch Mobility (24.48%). This was followed by VE Commercial Vehicles (12.03%), JBM Auto (9.96%), and Olectra Greentech (8.71%) which sold more than 20 E-buses each this month. Mytrah Mobility (4.98%) sold 12 E-buses this month against 6 E-buses the last month. Tata Motors has not been witnessing any sales of E-bus from the last three months now.

Fig 2.9: Player-wise E-bus sales trend



Source: Vahan Dashboard, JMK Research Note: Sales figures represent E-buses registered across 1,340 RTOs in 34 states/ UTs.



3 POLICIES AND REGULATIONS

UP Cabinet Approves New Electric Vehicle Policy

The Uttar Pradesh Cabinet has approved a new electric vehicle policy which was drafted in September 2022.

- The main objective of the EV policy is to make the state a global hub for the manufacturing of electric vehicles, batteries, and associated equipment.
- As per the draft of the UP Electric Vehicle Policy 2022, a 15 per cent rebate will be given on the purchase of two-/three/fourwheeler electric vehicles and e-buses. For the first three years after implementation of the EV policy, a 100 per cent exemption will be given for the registration of electric vehicles and road tax. In the fourth and fifth years, 50 per cent relaxation will be given.
- Government employees will be encouraged to buy EVs for which advance will also be allowed by the state government.
- The new policy provides capital subsidy at the rate of 30 per cent on investment subject to maximum INR1,000 crore per project to maximum of first two Ultra Mega battery projects, investing INR1,500 crore or more each for setting up battery manufacturing plant in the state of minimum production capacity of 1 GWh.
- The policy provides stamp duty reimbursement to the manufacturers, which is at the rate of 100 per cent to Integrated EV Project and Ultra Mega Battery projects for setting up facility anywhere in the state.

Govt may clear semiconductor unit proposals in next 30-60 days

The government is likely to start approving proposals to set up electronic chip and display manufacturing plants in the country in the next 30-60 days. The government has received proposals from five companies for setting up electronic chip and display manufacturing plants with an investment of INR1.53 lakh crore. Vedanta Foxconn JV, IGSS Ventures, ISMC propose to set up electronic chip manufacturing plants with US\$13.6 billion investment and have sought support of US\$5.6 billion from the Centre under the INR76,000 crore Semicon India Programme.

1000+ EV Charging Points in Delhi in Less Than Year under single window facility

The capital of Delhi attained a new milestone as it now boasts



of 1,000 Electric Vehicle charging points that too in less than a year under its single window facility. In November 2021, the Delhi government set in place an innovative, single-window facility for installation of EV chargers in private and semi-public spaces in Delhi, which includes residential spaces like apartments and group housing societies, institutional buildings like hospitals, and commercial spaces like Kirana stores, shops, and malls.

Crack down on EV sellers that claim low top speeds to evade regulation: Centre to states

The Ministry of Road, Transport, and Highways has cautioned state governments about higher battery capacity electric vehicles that are evading checks under the garb of low-speed ones. Many dealer showrooms have mushroomed across the country that have indulged in sale of battery-operated two-wheelers in contravention to the provisions under the Central Motor Vehicles Rules (CMVR), 1989. The state governments have been asked to take action against such errant operators.

Govt halts sops for Okinawa, Hero Electric on manufacturing norms

The government has cracked down on electric two-wheeler companies that allegedly did not comply with the requirement for localisation of components and has suspended incentive payment to Hero Electric and Okinawa. In addition, companies including Greaves Cotton's Ampere, Rattanindia's Revolt, Okaya and Jitendra EV have to face an audit by ARAI (Automotive Research Association of India) to check if they meet the required level of localisation under the FAME-II scheme. The INR10,000-crore scheme provides incentives for multiple categories of registered vehicles using advanced batteries with an aim of electrifying 10 lakh electric two-wheelers.

Another PLI scheme in offing for more advanced EV battery tech

In a bid to encourage research on new technologies and innovations, the central government is likely to notify another Production Linked Incentive (PLI) scheme for more advanced EV battery technologies. The scheme launch is expected by December this year. 6 companies are in discussions with the policy making body for the additional ACC PLI Scheme. The scheme will target technology players who could not participate in the existing ACC PLI Scheme. It will also focus on the advancement technologies that may come to market 5 years or later, including solid state battery technology.



Govt buys EVs back from users to take apart and check for local parts

Dismantle and investigate is the new approach being adopted by the government to get to the bottom of the alleged electric vehicle subsidy misappropriation scam. On a direction from the heavy industries ministry, dozens of electric two-wheelers have been bought back from customers to pull them apart and inspect whether the manufacturers have violated the localization rules under the government's flagship EV-promotion scheme, Faster Adoption and Manufacturing of Electric and hybrid vehicles in India (FAME-India). The Automotive Research Association of India, Pune (ARAI) and International Centre for Automotive Technology (ICAT), Manesar are undertaking the inspection.

Implementation of API based online data transfer for FAME II registration

The Ministry of Heavy Industries has decided to implement the API based on-line Data Transfer System for FAME-II scheme for e-2W OEMs w.e.f. 01st Oct 2022. This online data transfer system will be applicable for those eligible e-2W OEMs having Enterprise Resource Planning (ERP) system. Those OEMs not having ERP systems at present will always have option available to migrate to this online Data Transfer System or they may continue with the existing system.

More than 3,000 electric buses to ply on roads in 2 yrs under FAME-II scheme

Over 3,000 more electric buses will ply in various cities of the country in the next two years under the FAME-II scheme. The Faster Adoption and Manufacturing of Electric Vehicles in India Phase II (FAME India Phase II) scheme was passed in 2019 for encouraging electric mobility in the country. The plan elaborates on supporting 10 lakh electric two-wheelers, 5 lakh electric three-wheelers, 55,000 electric fourwheelers and 7,000 electric buses.

FAME-II schemes: Govt to digitally monitor EV parts localisation

The government is in the process of making live an automated data transfer system to monitor localisation content of electric vehicles availing subsidies under the INR10,000 crore FAME-II policy to promote indigenous manufacturing and ensure imported vehicles do not get incentivised at the expense of Indian taxpayers. The



IT-enabled system based on Application Programming Interface (API) would enable smooth transfer of a set of critical data related to domestic value addition (DVA) from the beneficiaries' existing enterprise resource planning (ERP) systems to the nodal ministry's portal along with traceability of products based on digital footprints from October 1.



4 CHARGING INFRASTRUCTURE & BATTERY SWAPPING

Stakeholder(s)/ Player(s)	Description
Fortum India	 Fortum India installed 46 new electric vehicle charging points at the Nexus Shantiniketan mall in Whitefield. The charging points include both AC chargers and even Combined Charging System (CCS) chargers. The Government of India is promoting EVs adoption in India and its target to reach 25 per cent EV adoption by 2030. The company earlier commissioned 50 EV charging points at Nexus Whitefield mall and decided to expand the charging points after it received a warm response from the users.
CESL	 Convergence Energy Services Limited (CESL) has selected agencies to set up 124 battery swapping stations and 352 standing chargers for electric two and three-wheelers. The selected agencies will also set up 1,294 standing DC fast chargers for electric four-wheelers. Kerbside charging is an emerging concept globally wherein EVs can be charged while being parked on roadside kerbs using either street light lamp posts or through dedicated charging posts. The business will be delivered under a Build, Own, and Operate (BOO) model valid for eight years with charging stations installed across Ahmedabad, Bengaluru, Chennai, Delhi, Kolkata, Mumbai, Pune, and Surat.
BPCL	 Bharat Petroleum Corporation Limited (BPCL) announced the launch of EV Fast-Charging stations on two corridors in India's southern region, Bangalore-Chennai and Bangalore-Mysore-Coorg Highway. The first phase included the Chennai-Trichy- Madurai highway. The fast chargers adhere to the CCS-2 protocol and are strategically placed at nine of its fuel stations located approximately 100 kilometres apart on both sides of the routes. Customers will be able to discover and charge their EVs in about 30 minutes, which gives them a travel range of up to 125 kilometres.
	nine of its fuel stations located approximately 100 kilometres apart on both sides of the routes. Customers will be able to discover and charge their EVs in about 3

Source: Industry news articles, JMK Research



5 KEY MANUFACTURING UPDATES

OGO Energy aims 1 GWh/year lithium battery capacity by Dec 2023

Indian start-up OGO Energy targets lithium battery manufacturing capacity of 1 GWh by December next year. Currently, it is setting up its first 100 MWh lithium battery assembly plant in Noida, Uttar Pradesh. It expects this plant to start production by Jan. 2023. OGO Energy will target stationery and e-mobility sectors with its products for behind -/front-of-the-meter applications in commercial and industrial (C&I) microgrids, data centers, e-mobility (3-wheeler electric vehicles), telecom, and automated guided vehicles. OGO Energy recently raised an undisclosed amount of capital. It plans to set up a state-of-the-art R&D facility and assembly plant to develop lithium-Ion battery energy storage systems with an in-house developed battery management system.

Maharashtra to create INR493 crore electronic manufacturing cluster, e-mobility to get a boost

Under fire for losing big-ticket projects like Vedanta-Foxconn and Tata-Airbus to neighbouring Gujarat, Maharashtra's deputy chief minister, Devendra Fadnavis, announced the establishment of an electronic manufacturing cluster (EMC) in Ranjangaon, near Pune. It will be developed over an area of 297.11 acres and will cost INR492.85 crore. This EMC is targeted to attract an INR2,000 crore investment and to generate 5,000 employment opportunities. It will target units of industrial electronics, consumer electronics, solar PV manufacturing, e-mobility products/components, etc.

Vedanta-Foxconn to establish chip plant at Gujarat's Dholera

India's first semiconductor fab unit will be set up in Dholera by a joint-venture entity formed by Vedanta Limited and Foxconn for a US\$20 billion investment. The entity has agreed to choose Dholera and will be the first semiconductor unit in India. Last month, Vedanta-Foxconn signed an MoU with Gujarat government to set up a semiconductor fab unit, a display fab unit, and a semiconductor assembling and testing unit.



6 OTHER MARKET UPDATES

Tata Motors bags order for 200 e-buses; to be deployed in Jammu, Srinagar

Tata Motors has received an order for 200 electric buses which will be deployed in Jammu and Srinagar. The Mumbai-based auto major has won the tender of 200 electric buses floated by Jammu Smart City Ltd. The automaker will supply 150 units of 9-metre and 50 units of 12-metre Star bus electric buses. As part of the contract, Tata Motors will operate and maintain the buses for a period of 12 years.

Ramkrishna Forgings wins INR121 crore EV parts order from Swedish OEM

Ramkrishna Forgings, one of India's leading suppliers of rolled, forged and machined products, has bagged a long-term supply contract worth INR 121 crore from a Swedish OEM. The supply order is for two components – tie rod arm tag and spring link – for an electric vehicle for supplies till 2030.

BYD India inaugurates PV showroom in Chennai

BYD India, a subsidiary of Warren-Buffett-backed EV maker BYD Auto has inaugurated its first passenger vehicle showroom in Chennai. The showroom, which is located at Ambattur, the automotive hub of Chennai, will be operated by KUN BYD. The facility is spread across 2000 square feet and features a 3S facility (Sales, Spares, and Services).

BYD India Inaugurates passenger vehicle showroom in Gurgaon

The world's leading new energy vehicle manufacturer BYD inaugurated its first passenger vehicles showroom in Gurugram and its eleventh outlet in India. Spread across 2,002 square feet, equipped with ultra-modern set-up with provision of charging about 100 EVs at any given point of time, the showroom is offering customers the best in-store experience.

Amid economic gloom, e-mobility to drive e-logistics sector, to swell to US\$9 bn industry

Amid widely talked about economic gloom, the Indian e-mobility sector is set for a roll. The e-logistics sector, which has become one



of the largest and fastest growing logistics markets globally, is all set to swell to a whopping US\$9 billion industry according to a recent Redseer Strategy Consultants report. The Indian e-logistics sector is likely to witness a compound annual growth rate of 35%. The number of e-commerce logistics shipments is expected to grow by four times in the next five years.

LoanTap opens online E-2W marketplace

LoanTap, a FinTech lender in the country, has launched an electric two-wheeler online marketplace. With the presence of India's top brands and over 1,000 dealers in one place, customers will have a wide range of options to choose from. They can check out the features and pick the bike of their choice without worrying about funds as LoanTap aims to provide seamless online E2W loan processing in the marketplace itself. The marketplace aims to be the one-stop-solution for enhancing clean mobility with loans up to 80%-100% of the e-bike value to be repaid in EMIs across a tenure extending up to 36 months. Its E2W loan will help fund e-bikes in the range of INR 20,000 to INR 200,000. Anyone with a minimum income of INR10,000 and above 21 years is eligible to apply, and the company will make E-2W loan approvals and disbursals easy and within 24 hours.

E-scooter battery sparks blaze, 15 e-bikes damaged

Hours after the 'faulty' battery of an e-scooter manufactured by a Jaipur-based start-up Batt:RE was returned to a Vasai dealer by the owner for replacement, it exploded. The battery, under warranty, was not being charged when sparks led to the explosion and a fire. While no one was injured, 15 e-bikes and furniture of the showroom were destroyed. It is the second case of an e-scooter battery of the same company exploding in Vasai. Last month, a 7-year-old boy died after the battery, being charged, exploded. While e-scooters in both cases are of the same model, the batteries belong to different companies. The battery that exploded was manufactured by 'Inverted company'. The battery that exploded in September was manufactured by 'Osaka'.

One in ten petrol pumps now offers EV charging, CNG

More than 8,000 petrol pumps, or one in every ten pumps across the country, now offer facilities to charge an EV or refuel a compressed natural gas (CNG) vehicle in a boost to customers who own or plan to buy the less polluting vehicles. India has about 84,600 fuel retail outlets, of which 8,900 offer alternative fuels such as CNG, auto LPG



or EV charging facilities. EV charging facility is available at 4,100 pumps, CNG at 4,000 pumps, and auto LPG at 700. The private sector, which controls a tenth of the country's fuel stations, offers alternative fuelling options at less than 200 pumps.

Uber reportedly begins electric car service in India

Uber has started its Uber Electric pilot program in India. The cab aggregator has started offering EV service in select places of Delhi-NCR. The company will be expanding the service to more areas in the coming months. The electric cabs are presently available for prescheduled trips only.

Volvo rolls out first locally assembled unit of XC40 Recharge

Swedish luxury vehicle manufacturer Volvo has rolled out the first locally assembled unit of its electric sport utility vehicle (SUV) the XC40 Recharge. The XC40 Recharge was rolled out from Volvo Car India's manufacturing facility in Hoskote near Bangalore Rural. XC40 Recharge recorded online bookings of 150 cars within hours of opening bookings on July 27 this year. The model gives over 400 km on a single charge. The XC40 Recharge is Volvo's first electric car in India. It was launched on July 26 this year at a starting price of INR55.9 lakh (ex-showroom). The SUV is the first locally assembled luxury electric vehicle in the country. The XC40 Recharge has an electric range of up to 418 kilometres and can accelerate from 0-100 km/hour in 4.9 seconds.

MG Motor to launch affordable EV car in bid to compete with Tata in Indian market

MG Motor India is set to launch an affordable electric vehicle priced below INR15 lakh in the local market next financial year to challenge the dominance of home-grown auto major Tata Motors in the green mobility segment. The company will source batteries for the product locally to keep prices competitive. With this vehicle in the mainstream market, the company expects EVs to generate up to a quarter of its sales next year.

BNY Mellon to convert its corporate vehicles fleet into electric in India by 2025

Global financial services provider BNY Mellon plans to convert its corporate vehicle fleet into electric in India by 2025. The company has a total fleet of 700 diesel-powered Multi-Purpose Vehicles (MPVs). In the first phase of the project, BNY Mellon has unveiled a fleet of 20 Electric Vehicles on its company premises in Pune on a pilot basis. They are likely to make 30,000 trips and are expected to save



over 99,000 kilograms of carbon emissions annually. These MPV style cars have a range of 500 kilometers on a single charge and will primarily be used as part of the company's employee transportation programme in Pune and Chennai.

Three Wheels United forays into electric two-wheeler financing

Three Wheels United (TWU), a global fintech company for EV financing, has forayed into electric two-wheeler financing. Over the next 6 months, TWU aims to finance 2,000 two-wheelers across Karnataka and Delhi NCR. Three Wheels United provides affordable financing solutions for drivers to easily make the switch from conventional vehicles to electric two- and three-wheelers.

Carzonrent to convert its entire fleet of 5k cars to electric by next year

Car rental firm Carzonrent has launched an initiative to transition its entire existing fleet of 5,000 cars to electric vehicles within the next 12 months. Under its electric service platform Plug, the company is looking to expand its reach across different cities by adding 20,000 cars to its fleet over the next five years. The company is set to induct EV fleets to service its corporate, airline, hotel, government/ PSU customers, besides air travelers who are transiting from major airports in different cities across the country.

Gadkari launches Toyota's pilot project on flex fuel-strong hybrid EV

Union minister Nitin Gadkari launched Japanese car maker Toyota's first-of-its-kind pilot project on flex fuel-strong hybrid electric vehicle (FFV-SHEV) that can run on 100 per cent ethanol. During the launch, the Toyota Corolla Altis FFV-SHEV, which has been imported from Toyota Brazil for the pilot project, was unveiled. As a part of this project, a Memorandum of Understanding was also signed between Toyota Kirloskar Motor (TKM) and the Indian Institute of Science (IISc), Bengaluru.

India becomes the first base for Mercedes Benz to assemble EVs outside Germany

Luxury carmaker Mercedes-Benz, which launched the EQS 580, India's first locally-assembled Luxury electric car with a claimed range of 857 kms. Claimed that its plant in Pune is the company's first assembly plant for EVs outside Germany.



7 DEALS & INVESTMENTS

Company name	Company type	Deal type	Investor(s)	Deal value (US\$ Mn)	Details
Revfin	EV financing digital platform	Equity	Green Frontier Capital (GFC), a VC fund focusing specifically on climate in- vestments and LC Nueva Investment Partners	10	Revfin raises US\$10 million in a Series A funding
Ather Energy	E2W Manufacturer	Equity	Caladium Investments	50	Ather Energy raises US\$50 Mn led by Caladium Invest- ments
Vecmocon	E2W Manufacturer	Equity	Tiger Global, Blume Ven- tures and other investors	5.2	EV solutions start-up Vec- mocon raises \$5.2 Mn for business expansion
Electriq	E2W Solution Provider	Equity	Yamaha Motors	Undisclosed	Yamaha Motors Leads Fund- ing in EV Startup Electriq
Euler Motors	E3W Manufacturer	Equity	Government of Singapore Investment Corporation (GIC)	60	Euler Motors raises US\$ 60 Mn, to expand EV retail network to 12 new cities by March
Revolt Motors	E2W Manufacturer	Aquisition	RattanIndia	Undisclosed	RattanIndia buys out elec- tric vehicle maker Revolt Motors

Source: Industry news articles, JMK Research

Magna to invest US\$120 Mn to establish innovation centre in Bengaluru

Canadian Tier 1 major Magna International plans to invest over US\$120 million to set up a new engineering centre in Brigade Tech Garden, Bengaluru. The technology development centre will focus on vehicle electrification and software defined vehicles. Approximately 1,000 engineers and technical experts are expected to be hired by the end of 2023, with the capacity to add up to 250 more as needed. The centre will serve as a key base for the company in powertrain electrification, electronics, and software defined vehicle development.



PE funds in electric vehicles may cross US\$1 billion in 2022

Private equity investment in India's electric vehicle industry could top a billion dollars this year, as investors see new policy initiatives and rising cost of fossil fuel accelerating the adoption of green mobility. Investors pumped in US\$904 million through 26 deals in the nine months to the end of September, including in battery manufacturing and battery swapping and charging stations.



8 JVs & PARTNERSHIPS

Companies involved	Purpose of Partnership
Panache Digilife and Revamp Moto	 Panache Digilife Ltd, specializing in design, manufacturing, distribution and services of ICT & IoT devices, will assemble EVs for Revamp Moto, a modular electric vehicle manufacturer at the facility in Bhiwandi, Mumbai. Revamp Moto will work on new product development (NPD), Research and Development (R&D), new technologies, and generating IPs. Panache will focus on quality product assembly, process optimization, and indigenization of components.
IHCL and Tata Power	 India's hospitality brand, Indian Hotels Company Ltd (IHCL) has installed 224 electric vehicle charging points at 92 of its properties. The initiative is in line with Paathya, the company's ESG+ framework to drive its sustainability and social impact measures. The EV charging points have been installed in collaboration with Tata Power and are present at various Taj, SeleQtions, Vivanta, Ginger and ama Stays & Trails properties across the country.
Mahindra and Charge+ zone	 CHARGE+ZONE EV Charging Network company and Mahindra & Mahindra has announced a partnership to set up a network of EV charging stations for Mahindra's range of upcoming electric SUVs. By the end of this fiscal, Mahindra's EV users will have access to the Charge+Zone's network of 2,500+ charging points across 25 cities and 10,000kms highways. As part of the partnership, CHARGE+ZONE and Mahindra will explore the installation, commissioning, and maintenance of fast DC chargers at various locations including owned and rented sites.
Kinetic and IndusInd Bank	 EV maker Kinetic Green Energy and Power Solutions Limited has joined hands with IndusInd Bank to offer easy and affordable financing for customers for its range of electric two-wheelers at Kinetic Green dealerships across India. Kinetic Green has so far designed, manufactured, and cumulatively sold over 60,000 electric vehicles and has marked sales of INR600 crore. Under the current scheme, customers will get up to 100 per cent LTV (loan to value) at lucrative interest rates for flexible tenures. The loan deal will enable financing options for both salaried and self-employed customers.
Tata Motors and Evera	 Tata Motors has bagged an order for 2,000 XPRES T EVs from ride-hailing platform Evera. These vehicles are an addition to the existing fleet of Tata Motors' EVs with the aggregator.



Companies involved	Purpose of Partnership
Triton and BEL	 Electric vehicle maker Triton Electric Vehicle India has issued a letter of intent to defence public sector unit Bharat Electronics for the procurement of battery packs for its semi-truck project in India at an estimated value of INR8,060 crore. The filing stated that the 300-kilowatt lithium-ion battery packs are to be delivered by Bharat Electronics (BEL) to Triton in 24 months commencing from January 2023.
Mahindra and Statiq	 Mahindra & Mahindra and Statiq, an EV charging provider, announced an e-mobility partnership to offer EV users with a robust, accessible, and reliable mobility network in India. Going forward, both the companies will also partner on different e-mobility tech integration projects.
Omega Seiki Mobility and CABT	 Omega Seiki Mobility, an Anglian Omega Group Company, and Creativity at Best Technologies Pvt. Ltd. (CABT), a technology-driven logistics service provider entered into a strategic partnership for leasing 500 Omega Seiki Mobility electric three-wheelers to CABT. Both the companies will expand this partnership to lease 1,500 electric vehicles by the end of 2025.
Hero Electric and Spoctech Green	 Hero Electric has announced a partnership with Spoctech Green Ventures Pvt Ltd to introduce last-mile delivery solutions in Chennai. With this partnership, Hero Electric has agreed to deploy 5,000 electric vehicles in Chennai over the next 2 years and work with Spoctech to offer last-mile delivery solutions. Spoctech is a next-generation platform connecting clean technology with Fintech solutions In partnership with Parveen Travels Pvt Limited, Spoctech launched e-mobility services in Chennai through its EV Aggregator Platform ZeMP (Zero Emission Mobility Platform). ZeMP provides customized solutions to supply chain companies, merchants, operators, and riders to adopt electric vehicles.
SEAPL and LML	 New Delhi-based Saera Electric Auto Private Limited (SEAPL) has inked a contract manufacturing agreement with Lohia Machines Limited (LML) for its proposed three electric two-wheelers – Moonshot motorcycle, Star scooter, and Orion bike – expected to break cover early next year. SEAPL is known for its 'Mayuri' e-rickshaw. LML's electric two-wheelers will be manufactured at Saera's Bawal manufacturing facility in Haryana. From this facility, 2-lakh units of electric 2-wheelers will be manufacturing capacity of around 36,000 units of electric three-wheelers.



Companies involved	Purpose of Partnership
One Electric Motorcycles and ALT Mobility	 ALT Mobility, based out of IIT Delhi and working with multiple OEMs and financing institutions to provide electric vehicles on lease to B2B fleet operators, has partnered with One Electric to provide high-quality and durable electric motorcycles for its last-mile delivery partners. Breaking the convention of investing in low-cost assets, ALT Mobility has evaluated and onboarded its leasing portfolio One Electric's ""Kridn"" motorcycle, positioned as a premium high-speed electric two-wheeler for intra-city transportation catering to passenger and goods segments
Causis and Kalyan Dombivli Municipal Transport	 Causis E-Mobility, a London-based mass transit company, has bagged a contract for providing over 100 e-buses to Kalyan-Dombivli Municipal Transport (KDMT). A total of 107 9-metre midi, AC and Non-AC German-made 'EuraBus' electric buses have been sanctioned by the Kalyan-Dombivli Municipal Corporation (KDMC) with drivers and allied electrical and civil infrastructure on a Wet Lease basis for a period of twelve years.
M&M and Jio-bp	 Mahindra & Mahindra (M&M) and Jio-bp are enhancing their existing partnership by setting up a robust charging network for the upcoming Mahindra e-SUV launches. Starting with 16 cities, Jio-bp will install DC fast chargers at M&M dealership network and workshops across the country.
Toshiba and EVage	 Toshiba India has signed an agreement with EVage Automotive to supply its SCiB (Super Charge ion Battery) rechargeable lithium-ion cells to power the next 10,000 EVage electric commercial vehicles. This partnership follows two years of development and joint validation to incorporate these cells into EVage's proprietary ultra-stable and rapid charging battery packs.

Source: Industry news articles, JMK Research



9 GLOBAL MARKET UPDATES

Panasonic to start building Kansas battery plant next month

Japan's Panasonic Holdings Corp will start building a new battery plant in Kansas in November and aims to begin mass production by March 2025, targeting North America's fast-growing market for electric vehicles. The company would produce its 2170 model lithium-ion battery cells, which are already supplied to Tesla, but may eventually make the more advanced 4680 format battery currently under development that is about five times larger and will offer major improvements in cost and vehicle range.

EU approves effective ban on new fossil fuel cars from 2035

The European Union struck a deal on a law to effectively ban the sale of new petrol and diesel cars from 2035, aiming to speed up the switch to electric vehicles and combat climate change. Negotiators from the EU countries and the European Parliament, who must both approve new EU laws, as well as the European Commission, which drafts new laws, agreed that carmakers must achieve a 100% cut in CO2 emissions by 2035, which would make it impossible to sell new fossil fuel-powered vehicles in the 27-country bloc.

Volkswagen brand will be electric-only carmaker in Europe from 2033

The Volkswagen brand will only produce electric cars in Europe from 2033. In the coming decade the VW brand would narrow down the number of models on offer to focus on core models, with the aim of raising the profit margin for all volume brands – Volkswagen, SEAT, Skoda, and commercial vehicles – to 8% by 2025.

Electric Vehicles Hit 35% Market Share in China in September

While the U.S. continues to push forward on electric vehicle adoption, other countries are racing ahead in terms of the percentage of EVs compared to traditional automobiles. China hit a 35% market share for new electric vehicles in the month of September. Sales of electric vehicles hit 35% of all new vehicle sales in September for China, as Tesla was announcing price cuts in the region. Plugin vehicles were up 78% year-over-year in September and hit 636,000 new





registrations, a new record for the country.

Vietnamese EV maker VinFast receives US\$135 Mn in green funding led by ADB

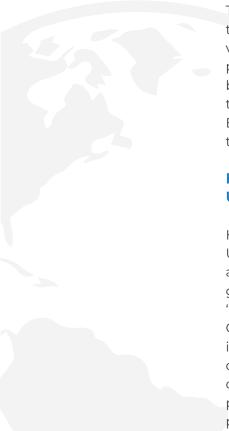
Vietnamese electric vehicle maker VinFast has received a US\$135 million financing package led by the Asian Development Bank (ADB), part of a push by the bank to boost climate-friendly investments in the region. VinFast, which began operations in 2019 and stopped making combustion engine-driven cars in August, is targeting global electric vehicle sales of 750,000 per year by 2026. It is also gearing up to expand in the U.S. market. Vietnam's transport sector accounts for 18 per cent of the country's greenhouse gas emissions. The funding will also support Vietnam's efforts to achieve net-zero greenhouse gas emissions by 2050.

Automakers to double spending on EVs, batteries to US\$1.2 trillion by 2030

The world's top automakers are planning to spend nearly US\$1.2 trillion through 2030 to develop and produce millions of electric vehicles, along with the batteries and raw materials to support that production. Automakers have forecast plans to build 54 million battery electric vehicles in 2030, representing more than 50% of total vehicle production. To support this unprecedented level of EVs, carmakers and their battery partners are planning to install 5.8 terawatt-hours of battery production capacity by 2030.

Hyundai breaks ground at new EV and battery plant in the US

Hyundai Motor Group has officially announced the setting up of a US-only US\$5.54 billion (INR45,943 crore) plant to establish itself as a global top-tier electric vehicle OEM. The Korean carmaker held a ground-breaking ceremony for the new electric vehicle-only plant 'Hyundai Motor Group Meta plant America (HMGMA)' in Bryan County, Georgia, USA. Approximately US\$1 billion (INR8,293 crore) is anticipated to be invested by non-affiliated HMGMA suppliers in connection with the project in other locations. HMGMA will be built on a site of 11.83 million square meters with a scale capable of massproducing 300,000 electric vehicles per year. Construction of the plant will begin in the first half of next year and mass production of EVs will begin in the first half of 2025.





Mercedes signs 1.5 billion euro deal with Rock Tech Lithium to push e-car drive

Mercedes-Benz has signed a supply agreement with Canadian-German Rock Tech Lithium Inc to receive on average 10,000 tons of battery-grade lithium hydroxide per year. The deal allows the luxury carmaker to supply its battery partners with raw material, starting in 2026, including a qualification period, in order to rapidly scale up production of fully electric vehicles. The deal has a volume of US\$1.47 billion and will cover enough lithium hydroxide for 150,000 cars a year.

US award US\$2.8B in grants for EV batteries in 12 states

The Biden administration awarded US\$2.8 billion in grants to build and expand domestic manufacturing of batteries for electric vehicles in 12 states. A total of 20 companies will receive grants for projects to extract and process lithium, graphite and other battery materials, manufacture components, and strengthen U.S. supply of critical minerals.

Tesla tops battery-electric vehicle registrations in Germany, beating Volkswagen

Tesla topped registrations of battery-electric vehicles in Germany in the first nine months of this year at nearly 38,500, beating the Volkswagen brand by around 6,000 vehicles. Tesla's battery-electric registrations jumped nearly 50% from the January-September period last year, while Volkswagen's dropped 40% to just over 32,300 in line with a broader drop across most of the Volkswagen Group brands in Europe's biggest car market.

Amazon to invest over €1 billion in electric vans, truck fleet across Europe

Amazon Inc will invest more than €1 billion (US\$974.8 million) over the next five years in electric vans, trucks, and low-emission package hubs across Europe, accelerating its drive to achieve net-zero carbon. The US online retailer said the investment would help its electric van fleet in Europe more than triple from the current 3,000 vehicles to more than 10,000 by 2025.

US aims to hobble China's chip industry with sweeping new export rules

The Biden administration published a sweeping set of export



controls, including a measure to cut China off from certain semiconductor chips made anywhere in the world with US equipment, vastly expanding its reach in its bid to slow Beijing's technological and military advances. The rules, some of which take immediate effect, build on restrictions sent in letters this year to top toolmakers KLA Corp, Lam Research Corp, and Applied Materials Inc, effectively requiring them to halt shipments of equipment to wholly Chinese-owned factories producing advanced logic chips.

Chinese 'flying car' makes first public flight in Dubai

A "flying car" built by Chinese electronic vehicle maker Xpeng Inc made its first public flight in the United Arab Emirates, as the company works towards launching the electric aircraft in international markets. The X2 is a two-seater electric vertical take-off and landing (eVTOL) aircraft that is lifted by eight propellers - two at each corner of the vehicle.

SIXT agrees to purchase around 100,000 e-vehicles from China's BYD

SIXT has committed to buying around 100,000 electric vehicles from China's BYD in the coming years under a new partnership agreement signed by the two companies. Under the first stage of the agreement, SIXT is to order several thousand all-electric vehicles from BYD, the first of which will be available to SIXT customers in Europe in the fourth quarter of 2022. SIXT has then agreed to purchase around 100,000 more electric vehicles by 2028.



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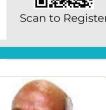














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