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Automotive Industry Weekly Digest

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[OEM Highlights] Tesla omits steering component from some Chinese-made vehicles to deal with microchip shortage

Tesla has excluded one of two electronic control units (ECUs) in the steering racks of some Chinese-made Model 3 and Model Y electric vehicles (EVs) to cope with microchip shortages, reports CNBC, citing two employees and company internal correspondence. This component reportedly is a secondary ECU in the electric power-steering system, which converts the movement of the steering wheel into turning of the wheels. Chinese media source Caijing reports that Tesla said the change poses no safety concerns as this secondary ECU is used primarily to support backup functions.



Outlook and implications

Tesla did not disclose this change and it is unclear whether this is to be a temporary solution for the EV maker to cope with tight semiconductor supply or is part of an effort to lower production costs. However, CNBC reports that Tesla employees said adding “level 3” automated driving functionality, which would allow a driver to operate a Tesla vehicle hands-free without steering in normal driving scenarios, would require the dual ECU system and, therefore, require a retrofit at a service visit. Production at Tesla's Shanghai Gigafactory in China was 486,000 vehicles in 2021, accounting for more than half of Tesla's vehicle production globally.

[OEM Highlights] Kia, Yueda Group to increase investment in Chinese JV

Kia plans to scale up its investment in China and introduce a series of new electric vehicles (EVs). The South Korean automaker signed an agreement with the Yancheng city government on 7 February to expand its existing joint venture (JV), Dongfeng-Yueda-Kia, reports Korea JoongAng Daily. According to the report, Kia will release six EVs in China by 2027, starting with the EV6 next year. A separate report by China Daily indicates that the new investment committed by Kia and its Chinese partner Jiangsu Yueda Automotive Group could reach USD900 million. Dongfeng-Yueda-Kia was originally set up as a three-way JV between Kia, Jiangsu Yueda Investment (Yueda Investment) and Dongfeng Motor Group. However, Dongfeng already withdrew from the JV in December 2021 by selling its 25% share to Jiangsu Yueda Automotive Group, a subsidiary of Yueda Investment's parent company, Jiangsu Yueda Group (Yueda Group). Kia is expected to announce a new name for the JV in April.



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Outlook and implications

Dongfeng's withdrawal from the JV is primarily due to its poor performance, as Kia's sales have been declining over the past five years. The JV posted a net loss of CNY4.75 billion (USD746 million) in 2022 on revenue of CNY21.94 billion. In the next five years, much of Kia's China strategy will be centred on expanding its EV line-up and launching more higher-priced models in China. Between 2022 and 2027, Kia will introduce a new EV in China each year to meet growing consumer demand for them. In addition to EVs, the automaker also plans to introduce the all-new KX5 and refreshed K3 in China. These new products will play a key role in improving Kia's brand image and help the automaker regain support from its dealers. As part of its China turnaround plan, Kia said it will stop rolling out vehicle priced below CNY100,000 (USD15,707) for the Chinese market. According to data from China Association of Automobile Manufacturers (CAAM), Dongfeng-Yueda-Kia's sales volume fell by 62% year on year in 2020 to 249,300 units. Sales volumes of the JV totalled 137,900 units in the first 11 months of 2021.



[Forecast & Analysis Highlights] NIO, Xpeng, and Li Auto report strong y/y sales growth in January

IHS Markit perspective

Implications EV startups in China have been riding the NEV wave in the country. The three startups are poised to break their own records in 2022 with new products coming to the market. To gain a stronger foothold both in China and overseas, and to accommodate the growing demand for their models, Xpeng, Li Auto, and NIO have all been focusing on technology development, new vehicle launches, and the expansion of sales points in China.

Outlook IHS Markit forecasts global sales of NIO, Xpeng, and Li Auto vehicles will be around 156,000 units, 114,000 units, and 86,500 units respectively during 2022.



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NIO, Xpeng and Li Auto, the three leading startups in China's new energy vehicle (NEV) sector, have all reported strong sales growth during January. **Xpeng** sold 12,922 vehicles last month, up 115% year on year (y/y). Deliveries in January consisted of 6,707 units of the P7 electric sedan, 4,029 units of the P5 electric sedan, and 2,186 units of the G3 and G3i electric sport utility vehicles (SUVs).

NIO announced that it delivered 9,652 vehicles in January, up 33.6% y/y. The deliveries consisted of 1,531 ES8s, the smart electric SUV; 5,247 ES6s, NIO's five-seater high-performance premium smart electric SUV, and 2,874 EC6s, its five-seater premium smart electric coupé SUV. NIO has been focusing on the deployment of its power, sales and service network in the country. As of 31 January, NIO has built 836 power swap stations, 3,766 power chargers and 3,656 destination chargers, and opened 42 NIO Houses, 341 NIO Spaces, 55 NIO Service Centres and 180 authorised service centres across the country.

Li Auto said its deliveries in January soared 128.1% y/y to 12,268 units. The automaker has been expanding its footprint and as of 31 January, it has set up 220 retail stores in 105 cities, as well as 276 servicing centres and authorised body and paint shops operating in 204 cities.

Outlook and implications

China's NEV segment has been experiencing substantial growth in sales despite the impact of the coronavirus disease 2019 (COVID-19) virus pandemic and supply chain constraints. The three startups are poised to break their own records in 2022, with new products coming to the market. Xpeng's product line will continue to expand this year to cover the higher end of the EV market. The G7, Xpeng's flagship electric SUV, will enable the automaker to capitalise on the growth of the electric SUV segment when it enters the market this year. Thanks to



the P7, Xpeng has already become one of the top sellers in the mid-size electric sedan market. NIO will begin sales of several new models this year as well. The ET7 electric sedan will begin deliveries in March, while volume production for the smaller ET5 will begin in the third quarter to meet the delivery timeline of September 2022. These two new models will complete NIO's premium electric vehicle (EV) product line, which is solely centred on SUVs at the moment. Meanwhile, Li Auto is expected to launch its second model, a full-size SUV featuring its range-extending technology this year, although its focus will still be on the family SUV market.

To gain a stronger foothold in China and overseas, and to accommodate the growing demand for their models, Xpeng, Li Auto, and NIO have all been focusing on technology development, new vehicle launches, and the expansion of sales points in China. NIO has started construction of a smart EV industrial park in Hefei, Anhui province. Called the Neo Park, the facility covers an area of 11.2 million square metres and includes manufacturing and research-and-development (R&D) facilities with a designed annual production capacity of 1 million vehicles and 100 GWh of batteries. Xpeng has announced plans to invest in a manufacturing plant in Wuhan, Hubei province. The new plant is to have an annual production capacity of 100,000 units and will expand Xpeng's production network and support the launch of new models.

IHS Markit forecasts sales of NIO, Xpeng, and Li Auto vehicles will be around 156,000 units, 114,000 units, and 86,500 units respectively during 2022.

[Forecast & Analysis Highlights] Hongqi reports sales growth of 30% y/y during January

Hongqi, FAW Group's premium brand, said its sales increased by 30% year on year (y/y) in January to 42,100 units. It did not reveal the sales volumes of individual models. Hongqi currently has eight models on the market, and the HS5 sport utility vehicle (SUV) is its best-selling model.



Outlook and implications

Hongqi started 2022 with strong January sales; last year, it sold more than 300,000 vehicles in China, up 50% y/y. Despite missing its sales target of 400,000 units for 2021, Hongqi has already become the fastest growing brand in the premium vehicle market thanks to rising demand for the HS5 and the H5 mid-size sedan. In the larger vehicle segment, Hongqi's flagship sedan, the H9, sold 40,000 units in 2021, up from 14,757 units in 2020. Hongqi plans to begin production of a new compact SUV and a new multi-purpose vehicle (MPV) this year. These new products will enable the brand to enter new vehicle segments and appeal to a wider range of customers. In addition, Hongqi's effort to grow its presence in the shared mobility market will continue in 2022. In Changchun,



where FAW is headquartered, 2,000 units of the Hongqi E-QM5 electric sedan featuring swappable batteries were added to the city's ride-hailing and taxi fleets during 2021.

[Technology & Mobility Highlights] Continental to bring robotic BEV charging to production by 2024

IHS Markit perspective

Implications	Continental is looking to bring a robotic BEV charging system to production this year in alliance with Volterio.
Outlook	The Continental system looks to be the first viable robotic charging system with a firm production date, a key piece of technology that could be an accelerator of vehicle electrification in Europe and elsewhere.



Car charging port

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Continental has unveiled a potentially key piece of technology in the acceleration of the electrification of the global vehicle parc in the form of a robotic battery electric vehicle (BEV) charging system, according to a company press statement. Continental is partnering on the new technology with startup Volterio; it became clear after discussions that they were both working on a similar solution simultaneously. Continental's development and production service provider Continental Engineering Services (CES) will combine its own know-how and proprietary technology with Volterio's; CES will also be able to meet all necessary certification criteria while developing the system to production maturity. The plan is for the first near production-ready system to be available this year. It will be demonstrated practically to OEMs and other potential customers before full series volume production begins in 2024, and Germany is planned as the production location.

Continental's and Volterio's robotic charging system comprises two separate elements. A charging portal unit is built into the underbody of the vehicle and the charging unit is placed on the garage or parking space floor. As soon the vehicle is parked, the two elements connect automatically via a smart system, which can be controlled via ultra-broadband – a radio-based communication technology for short-range data transmission. This means that the car does not have to be parked precisely in the right position for the charger and connector to be able to connect; there is a tolerance of up to 30 cm allowable from the optimum parking position, and the robot automatically aligns itself with the connector. This gives the system advantages over wireless charging systems



that have been proposed for parking garage charging, as there is a physical connection. This means that no energy is lost and the vehicle does not have to be perfectly positioned to get a full charge. The physical connector is of a conical shape, which allows a variety of alignments and orientations between the units. Commenting on the alliance Dr. Christoph Falk-Gierlinger, managing director of CES said, “Our charging robot is a real step in the evolution of making electric mobility more convenient and suitable for everyday use. With Volterio, we have the ideal partner for developing an efficient and simple solution for charging electric vehicles. Through this cooperation, we are combining the creativity and flexibility of a young start-up with the development experience and automotive expertise of Continental Engineering Services.”

Outlook and implications

This robotised BEV charging system is potentially an exciting development for the speed of electrification in Europe and in other regions. As around half of the EU’s residents do not have access to a garage or driveway in which they can home charge a BEV, compelling home charging solutions for those consumers are needed. While this solution does not necessarily help those potential BEV owners who live in houses with no off-street parking, it could be easily rolled out in city centre parking garages and the kind of car parking spaces that are allocated to flat developments in Europe and elsewhere. There are also many potential benefits for the user. Unlike conventional charging stations, users no longer have to worry about handling heavy, potentially contaminated or rain-soaked charging cables in confined garages, while the system does not require very accurate parking – unlike aforementioned wireless charging infrastructure. It will also be considerably cheaper and more flexible to install than any wireless solution, with the expense of installing them, especially into pre-existing infrastructure, the principal objection to this kind of system. Continental and Volterio have placed a lot of emphasis on developing the system for production and for scalability. Other companies have proposed robotic charging systems, most notably Volkswagen (VW), but its solution with a mobile energy storage unit appeared far more conceptual than Continental’s technology. This means it is easy and cost-effective to manufacture. The system can also be retro-fitted, so can be applied to existing BEV designs, according to Continental. The system will initially be offered for use in private households with a charge rating of 22 kW alternating current. The second stage of the product’s roll-out will be as a fast-charging solution for public areas that can be retracted into the ground. This will be able to serve parking garages, filling stations or factory areas with a charging capacity of more than 50 kW direct current. The really exciting aspect of this technology is how close it is to volume production. Continental will no doubt spend significant time over the next two years trying to sell it as a first-fit solution, initially most likely to premium OEMs, before serial production begins in 2024.

[Technology & Mobility Highlights] Shell begins hydrogen output in China to power Beijing Winter Olympics FCV fleet

Shell has unveiled a power-to-hydrogen electrolyser and hydrogen refuelling station in Zhangjiakou, Hebei province (China), reports Automotive News China. The project will be able to fuel a fleet of more than 600 fuel cell vehicles (FCVs) at the Zhangjiakou competition zone during the Beijing 2022 Winter Olympics, which began on 4 February. The 20-megawatts (MW) power to hydrogen electrolyser is its first commercial hydrogen development project in China, according to Gizchina. The project is part of a joint venture (JV) between Shell China and Zhangjiakou City Transport Construction Investment Holding Group formed in November 2020.



Outlook and implications

China is pushing for the large-scale adoption of hydrogen fuel cell technologies in commercial vehicles, especially logistics vans, buses and long-haul heavy trucks. The Hebei Fuel Cell Vehicle Demonstration City Cluster is one of the five industry clusters that identified by Chinese authorities to lead the lead the promote of FCVs in the country. According to Shell, the 20 MW electrolyser and hydrogen refuelling stations in Zhangjiakou are phase one of the JV. The companies have plans to scale up to 60 MW in the next two years in phase two. According to hydrogen energy company Beijing SinoHytec, more than 1,000 hydrogen FCVs are being used for the Winter Games.



[Chicago Auto Show 2022 Highlights] Toyota, Lexus, BMW feature recent new models; Hyundai to focus on safety

The 2022 Chicago Auto Show opens to the public on 12 February, following a media preview on 10–11 February. Ahead of the event, Toyota, Lexus and BMW announced they will show recently revealed new models. Toyota will give the recently revealed Sequoia and Tundra Capstone models their first auto show appearances, as well as highlight the bZ4X shown just ahead of the Los Angeles auto show in November 2021. Toyota will have 44 vehicles on display, and for the first time at this event, will have a Toyota Track available for the public to ride in some of the new products with a professional driver. Lexus will feature the all-new LX 600 and NX, as well as a SEMA project version of the IS 500. BMW will also display a number of recently introduced vehicles that have not previously been highlighted at a traditional auto show. Among them are the 2023 BMW iX M60, which was displayed at the CES technology show in January 2022 and the first M treatment for an EV. BMW will also show the new i4 M50, the M5 CS, the M3 Competition, the X5 xDrive 40i and the X3 M40i. Hyundai has also announced that its press conference on media days will discuss the company's safety technologies and have two safety-related news items.



Outlook and implications

While not all automakers have discussed their plans for the event, the announcements leading up to the show start reflect that automakers see the opportunity to connect with customers in this environment, which has largely been unavailable since the coronavirus disease 2019 (COVID-19) virus pandemic cancelled the March 2020 Geneva Motor Show. Although the Chicago auto show media days have been host to fewer all-new models in the recent years ahead of the pandemic, it remains highly attended in the region and is one of the most significant US auto shows for consumers. The announcements also reflect that automakers intend to continue supporting these events, integrating the new-found expertise with virtual reveals that automakers were essentially forced to use during the pandemic.

[Chicago Auto Show 2022 Highlights] Kia reveals Sportage PHEV; Chevrolet displays updated Blazer

Kia has revealed the plug-in hybrid electric vehicle (PHEV) version of the Sportage, while Chevrolet has announced a freshening up of the Blazer. Both models are to be displayed at the 2022 Chicago Auto Show in Illinois, United States, on 12–21 February. The Kia Sportage is new for the 2023 model year and production has just started in the United States. Kia's Sportage PHEV has a 13.8-kWh battery and an all-electric range of 32 miles. The PHEV has a 1.6-litre 177-hp 4-cylinder gasoline (petrol) ICE and a 6-speed automatic transmission



(Kia has not yet announced the total system power of the PHEV). The PHEV has an onboard 7.2-kW high-efficiency charger. On a Level 2 charger, Kia says the PHEV is able to be fully charged in about two hours. The Sportage PHEV is to be offered in X-Line PHEV all-wheel-drive (AWD) and X-Line Prestige PHEV AWD trim levels. The PHEV has a long list of equipment as standard, such as advanced driver-assistance features, including highway driving assist, as well as a 12.3-inch digital driver's cluster and 12.3-inch infotainment screen. Using the X-Line treatment as a base gives the PHEV an aggressive look. Kia has not yet disclosed the pricing of the Sportage PHEV. Meanwhile, the refreshed 2023 model-year Chevrolet Blazer is not all-new, but it receives a new front fascia, new grille, new LED headlamps and daytime running lights, and new tail-lamps. In addition, new wheels are available, in 18-, 20-, and 21-inch sizes. The interior has a new 10-inch diagonal infotainment screen as standard, and with more models, wireless charging comes as standard, while adaptive cruise control is available on more trim levels. In terms of powertrain, the current 228-hp 2.0-litre 4-cylinder and 308-hp 3.6-litre V6 engines are carried over, both mated to a 9-speed transmission.

Outlook and implications

Kia is holding a media conference at the Chicago Auto Show to reveal the Sportage PHEV; however, Chevrolet is not doing the same. The addition of the PHEV increases the Sportage powertrain line-up to three, including an optional 226-hp hybrid and a 187-hp 2.5-litre 4-cylinder engine as standard. Kia is positioning electrified powertrains as more advantageous to customers – along with offering better fuel efficiency and lower emissions, they should also deliver a better performance, it says. The freshening up of the Blazer is to carry the model through the rest of its lifecycle. However, Chevrolet is due to announce bigger news for the nameplate with the reveal of a Blazer EV by the end of 2022, although sales may not start until 2024.



2023 Chevrolet Blazer.

Picture courtesy of Chevrolet



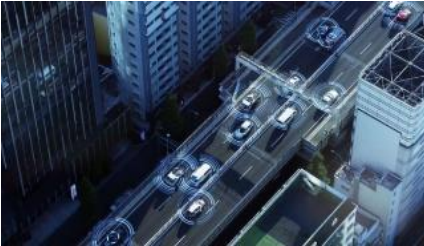
2023 Kia Sportage PHEV.

Picture courtesy of Kia Motor America



[Supplier Highlights] Opsy Tech announces deal to supply lidar sensors to auto supplier Huayu Automotive Systems Co.

New deal with HASCO will enable Opsy Tech to attain significant LiDAR market share by 2024–25



Source: Getty Images Plus/ metamorworks

Opsy Tech to supply light detection and ranging (LiDAR) systems to leading automotive components supplier Huayu Automotive Systems Co. (HASCO) for inclusion in production vehicles as early as 2024 or 2025, according to a press release published by PR Newswire on 9 February.

Eitan Gertel, Opsy Tech chairman, said, "This agreement with a world leading tier-1 automotive supplier HASCO, enables Opsy to enter the Asian automotive LiDAR systems market segment. It represents a strong and growing recognition that Opsy-Tech Pure Solid State Scanning Micro-Flash lidar technology and its superior performance to that of competitive systems, which will increase the safety of vehicles on the road while enabling the evolution of autonomous functionality at all levels up to Level 5."

Outlook and implications

HASCO's reach to several global automakers will enable Opsy Tech to further expand its footprint. Opsy Tech has developed an entirely new and innovative category of lidar: Pure Solid-State Scanning Microflash lidar without the inclusion of any moving parts in the system. The company's patented Scanning Microflash technology integrates the best of existing methods without trade-offs at the same time delivering superior reliability and performance in mission critical applications. According to Opsy Tech, the company's portfolio achieves four times the range of flash lidar while attaining flash lidar's resolution and scanning rate.

The HASCO deal builds on another recent Opsy Tech announcement to supply lidar units to another Asia-based supplier for production vehicles within the next two to three years.

[Supplier Highlights] Continental develops Level 3 automated driving solution capable of calculating high speed manoeuvres

New automated driving technology can calculate driving manoeuvres up to a speed of 130 km/h



Source: Getty/metamorworks

Continental's innovative Level 3 automated driving suite 'Driving Planner' allows complex driving manoeuvres up to 130 km/h. According to a press release by Autocar Professional on 7 February. The statement also said that the second phase of the software development has been completed and Continental is expected to roll out the automated technology in 2024.

Frank Petznick, head of the Advanced Driver Assistance Systems business unit at Continental explained that "With our intensively tested technologies for automated driving conforming to everyday requirements, we are significantly promoting road safety. Our solutions show automated driving can already offer a big plus in safety and comfort if we support drivers in typical, often stressful driving situations with intelligent technology."

Outlook and implications

Continental's Driving Planner is an innovative software technology solution enabling vehicles to master certain driving tasks without the need of a driver's intervention. Driving Planner calculates the combination of longitudinal and lateral movements over several seconds thereby ensuring master complex maneuvers of highly automated and safe driving.

Continental leverages the ShyTech display system to provide intuitive vehicle design and enhanced user experience. The display system is designed to make user guidance invisible when not needed and enabling interaction only on user demand. ShyTech solution seamlessly blends into a interactive cockpit design that creates a calm atmosphere in the cabin by presenting a decorative surface instead of presenting 'empty' black/blank screen or numerous physical buttons.



[VIP ASSET] BEVs emit more CO₂ than conventional cars in parts of northern China: researchers



09 February 2022 Max Tingyao Lin

Battery electric vehicles (BEVs) are emitting more lifecycle CO₂ than internal combustion engine (ICE) cars in parts of northern China, mainly due to the region's fossil fuel-dominated power generation mix, according to a recent study from Chinese researchers.

With strong policy support measures, including subsidies for vehicle purchases as well as government-sponsored technology and infrastructure rollouts in the past decade, China has emerged as the largest producer and buyer of BEVs globally.

Chinese policymakers see higher penetration of low-emission cars as essential to meeting the country's targets of peak CO₂ emissions by 2030 and carbon neutrality by 2060.

But the study from Bowen Tang of Hubei University of Technology, Yi Xu of Wuhan University, and Mingyang Wang of State Grid Sichuan Electric Power Company suggests more BEVs do not always lead to lower emissions.

Assessing 30 Chinese provinces and municipalities, the study found higher CO₂ emissions from BEVs than ICE vehicles in Beijing, Heilongjiang, Jilin, Tianjin, Shandong, Shanxi, and Hebei. In Beijing, where the difference is widest, a BEV would emit 45.7 metric tons (mt) in its lifecycle while an ICE vehicle would emit 42.2 mt.

In contrast, BEVs can help reduce CO₂ emissions in other areas. In Yunnan, where the decarbonization impact is the strongest, a BEV's lifecycle emissions amount to nearly 12 mt while an ICE vehicle's emissions are 30.3 mt.

"The promotion of BEVs helps to reduce carbon emissions in most regions in China," the researchers said. "However, the effectiveness of the emissions reduction dramatically varies ... due to the difference in electricity generation mix, thermal power generation technology, and electricity transmission efficiency."

The study highlighted the high proportions of coal, natural gas, and oil-fired power units in the electricity mix of the seven Chinese regions where BEVs have negative climate effects. Fossil fuels are responsible for 85%-90% of the power generation in three of them, and more than 90% in the other four.

"The effectiveness of the carbon emissions reduction through the promotion of [BEVs] is weakened in the regions with high penetration of thermal power," the study concluded.



Battery emissions

The study took into account the emissions from a car's production, operational, and recycling phases. It assumed a BEV emits 6.28 mt of CO₂ while an ICE car emits 3.38 mt when their raw materials are extracted and processed, without considering regional disparity.

The greater pollution caused by a BEV in the production stage is due to emissions created by producing batteries, which contain cobalt, lithium, nickel, aluminum, and rare earth elements, according to the researchers.

"For BEVs, the key technology is around the battery," according to the study, whose analysis is based on the lithium iron phosphate battery option, one of the two main types used in China. Such a battery consists of a cathode and anode, electrolyte, separator, packaging, and battery management system.



The components' production involves a graphite-coated copper foil and binder, polypropylene, polyethylene, lithium hexafluorophosphate, dimethyl carbonate, aluminum foil, a wire, circuit board, and sensor whose emissions are taken into consideration.

"Sufficient knowledge of the lifecycle carbon emission of BEVs is necessary for the sake of evaluation of the CO₂ emissions reduction, and guidelines on the BEVs' market development and policymaking," the study said.

Policy recommendations

Based on their findings, the researchers called on the Chinese government to create incentive schemes for original equipment manufacturers (OEMs) that use renewable energy during the production of BEVs.

They suggested the government can issue renewable energy certificates (RECs) to those companies—such certificates can be sold in a domestic trading scheme. Also, Chinese policymakers could design a vehicle score system that can promote the BEVs produced with low-carbon electricity.

Moreover, the government should provide more subsidies for driving BEVs in the areas with higher renewables penetration, the researchers said. Policies in fossil fuel-dominated areas should focus on generating more electricity from renewable sources, they added.

"Targeted promotion needs to be adopted in different regions," said the researchers, adding that the government should simultaneously improve cross-regional power exchange and transmission.

Electricity trading in China



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However, some experts told Net-Zero Business Daily that focusing on renewables over EVs in some regions and vice versa in others might not help China achieve its climate goals.

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