



Automotive Industry Weekly Digest

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[OEM Highlights] GM announces EV charger plan, reveals 2023 Corvette Z06, to resume Bolt EV production

IHS Markit perspective

Implications In a news-filled day, General Motors announced a plan to add 40,000 “community-based” charging stations in the US and Canada, working with its dealership network. GM also announced plans to resume some Bolt EV production and revealed a new 2.6-second 0-to-60 mph V8 for the 2023 Corvette Z06.

Outlook The new EV charging station installation programme is part of a planned investment of USD740 million announced earlier to expand home, workplace and public charging, and is designed to help address EV needs in underserved areas with Level 2 chargers. The resumption of Bolt EV production is against the backdrop of the company working to ensure optimal battery production and supply-chain logistics following the recall of all Bolt EVs. The Corvette Z06 V8 could end up being the last clean-sheet V8 developed for light vehicles by GM and reflects that, although EVs may be the future, today’s market requires the meeting of customer demand with the performance of traditional ICE vehicles as well.

General Motors (GM) has announced a plan to add 40,000 “community-based” electric vehicle (EV) charging stations in the United States and Canada, as well as plans to resume some Bolt EV production. In addition, GM has revealed the 2023 Corvette Z06 with a new V8 engine, claiming acceleration from 0 to 60 mph in 2.6 seconds.



GM Ultium home charger.

Picture courtesy of General Motors

Under GM’s new EV charging station programme, 40,000 Level 2 Ultium-branded EV chargers are to be installed across the US and Canada, beginning in 2022; however, a specific investment amount under the programme has not been disclosed. GM plans to provide the chargers and its dealers will determine the optimal installation locations. Installation at dealerships is discouraged under this programme. The charging points are to be installed “at key locations in the dealer’s respective communities, including workplaces, multi-unit dwellings, sports and entertainment venues and colleges and universities”, according to a company statement announcing the programme. The chargers are to be available to all EV owners, although the dealerships will be able to add their own branding information. GM will give each of its EV dealers up to 10 Level 2 destination charging stations and work with the dealers to help them deploy them in key locations. GM will assist dealers in applying for incentives and other funding and access to programmes, which could expedite deployment. An Automotive News report cites GM’s chief architect for EV charging infrastructure, Alex Keros, as indicating that GM expects that site owners will cover the cost of installation for most of these chargers and set the pricing or decide if they will let



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customers use them free. In addition, more charging stations than planned currently could be deployed, as Keros reportedly said, “We’ll keep our ear to the ground on how they’re deployed if there’s interest in more.”

In addition to the EV charger programme with dealerships, GM has announced a new line of Ultium-branded Level 2 smart charging units to be made available to retail and commercial customers, both through dealerships and online, in 2022. The Ultium chargers to be available to EV owners will include three units, developed with CTEK. Customers can choose an 11.5-kilowatt/48-amp smart charger; an 11.5-kW/48-amp premium smart charger; or a 19.2-kW/80-amp premium smart charger. Each charger is Wi-Fi and Bluetooth enabled and each features dynamic load balancing and is upgradable via over-the-air updates. The premium versions also have a customisable touchscreen and embedded cameras. As part of the app ecosystem and overall Ultium 360 programme, customers will be able to set a charging schedule, view statistics on charging habits, and obtain information on charger status through GM-branded mobile apps. Customers will be able to roll the cost into a loan or lease with GM Financial; however, GM has not yet indicated the cost of the chargers.

GM president Mark Reuss said, “These two initiatives are part of our plan to put everyone in an EV, making access to charging even more seamless than before. We want to give customers the right tools and access to charging where and when they need it, while working with our dealer network to accelerate the expansion of accessible charging throughout the U.S. and Canada, including in underserved, rural and urban areas.”

2023 Chevrolet Corvette Z06: 670-hp, 5.5-litre LT6 V8



*2023 Chevrolet Corvette Z06 with Z07 package.
Picture courtesy of General Motors*

Chevrolet has announced the latest Corvette Z06 for the 2023 model year and claims in a statement that it is “the highest horsepower, naturally-aspirated V8 to hit the market in any production car, ever”. Chevrolet describes the Z06 as “designed and engineered to act as a precision tool for the track”. Along with a new engine, the vehicle has a wider, sculpted front and rear fascia and elevated interior appointments. In a statement emailed to IHS Markit, Steve Hill, vice president of Chevrolet, said, “This new Z06 was designed and engineered to set a higher bar with increased levels of craftsmanship, personalization and performance so customers can truly have their own bespoke performance car.” Chevrolet says the engine has an all-new flat-plane crankshaft and an 8,600-rpm redline, and that the company worked on the exhaust tone for two years. The car is due to arrive in mid-2022 and is to be available as a coupe or convertible. The pricing and estimated fuel economy are to be announced closer to the launch date.



2023 Chevrolet LT6 5.5-litre V8 engine.

Picture courtesy of General Motors

As with previous Z06 models, the 2023 Z06 has a close relationship to the racing programme; the Z06 chassis is the same as for the C8.R racing car, which has been in competition since 2020. The first Z06 launched in 1963 was an optional special equipment package meant for racers. The model is 3.6 inches wider than the standard Stingray, in part to accommodate 345-series rear tyres and more airflow through the side vents. Chevrolet says the 2023 model year is the first time the Z06 has had unique front and rear fascias, designed to optimise cooling. The standard 20-inch front and 21-inch rear wheels are forged aluminium; however, lightweight and rigid carbon-fibre wheels are optional. The 2023 Z06 has specific tuning, Magnetic Ride Control 4.0 as standard, and larger brakes than previously. The 8-speed dual-clutch transmission has a 5.56 final drive ratio for improved acceleration. The interior has up-level materials, including a new carbon-fibre trim. Finally, there is an optional Z07 package for the Z06 that provides 734 pounds of downforce at 186 mph with a carbon-fibre high rear wing and ground effects, further chassis tuning and specific Magnetic Ride Control calibration, and Michelin Cup 2 R ZP tyres and Brembo carbon ceramic brakes. The 2023 Z06 has as standard a front splitter and unique rear spoiler with an installable fixed wickerbill to provide 365 pounds of downforce.

The new engine has an all-new aluminium cylinder-block casting. This includes Chevrolet's Small Block engine family signature 4.4-inch bore spacing, all-new dual-overhead-camshaft cylinder head design, dual-coil valve springs with titanium intake and sodium filled exhaust valves, forged aluminium pistons and forged titanium connecting rods and new six-stage dry-sump oiling system. The engine is hand assembled at the automaker's Performance Build Centre, which is inside the Bowling Green Assembly plant, where the sports car is produced. The 2023 Z06 also has a drive mode selector and features including launch control, active handling with StabiliTrak, traction control, performance traction management, and electronic limited slip differential.

Bolt EV production

Reuters reports that GM is to resume production of the Bolt EV and electric utility vehicle (EUV) on 1 November 2021 for two weeks. The plant that builds the Bolt has been offline since August. In August, GM expanded a recall of the Bolt EV and EUV to include all vehicles that had been produced, on concerns over a potential fire risk. The resumption of production also follows GM and battery supplier LG reaching an agreement on the cost of the recall. In September, the two companies announced that they had found a fix for the battery issue behind the recall, an issue claimed to be related to 13 fires, which involved no injuries; the issue caused GM to make specific recommendations to vehicle owners on charging patterns and storing the vehicles outside.

Outlook and implications



The new EV charging station installation programme is part of a planned investment of USD740 million announced earlier to expand home, workplace and public charging, and is designed to help address EV needs in underserved areas with Level 2 chargers. The resumption of Bolt EV production is against the backdrop of the company working to ensure optimal battery production and supply-chain logistics following the recall of all Bolt EVs. The Corvette Z06 V8 could end up being the last clean-sheet V8 developed for light vehicles by GM and reflects that, although EVs may be the future, today's market requires the meeting of customer demand with the performance of traditional ICE vehicles as well.

GM involving dealers in the charging station installation programme reflects their importance to the automaker as the company transitions to new forms of mobility products and services and an expanded business model. In addition, the charging station investment programme builds on GM's work with various EV charging companies, in an effort to make the charging experience as easy as possible for vehicle owners. Dealers typically are highly involved and invested in their communities and they should help to determine optimal locations for the chargers. GM says that 90% of the US population lives within 10 miles of a GM dealership, indicating the level of integration that these sales points have with US communities.

The Z06 is the Corvette that brings racing technology most directly to the street. However, due to racing regulations, the Z06 is more powerful than its racing cousin, despite the engines of the two models having the same 5.5-litre displacement. Compared with the prior Z06, the 2023 model's new engine develops an extra 20 horsepower, from 650 hp in the prior car, although this is still impressive for a naturally aspirated engine. Although the Z06 is the closest model to the track model, a true range-topper in the ZR1 is expected to arrive, which has been rumoured to develop 800 hp. However, as Corvette is to remain a key part of the future of the GM group, the brand will need to begin to pivot its image and performance away from the traditional high-power V8 to emphasising the performance that EVs can accomplish.

[OEM Highlights] Chery New Energy and Cowarobot to jointly develop automated vehicles

Chery New Energy Automotive Technology has signed a strategic co-operation agreement with Anhui Cowarobot, according to a news report by Pandaily. The deal will enable Cowarobot to integrate its technology developments with applications in the autonomous vehicle space. In the future, Cowarobot will collaborate with Chery to implement Level 4 commercial applications in public spaces. The two parties will fully utilise their respective advantages and will work closely in the fields of online control of vehicle chassis, key sensing devices for automatic driving, and automatic driving algorithms.



Outlook and implications



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Chery New Energy focuses on research and development (R&D), production, sales, and investment in new-energy vehicles (NEVs) and their key components. It has an international-level vehicle development process and standard system, as well as core technologies in 32-bit vehicle control, integrated thermal management, heat pump air conditioning, and NEV-integrated battery packs. Cowarobot is a new and prominent enterprise in China's field of autonomous driving. SB China Venture Capital (SBCVC), BAIC Capital, Chuangshi Partner, and HuaJin Capital have all invested in the company since its inception in 2015. It focuses on autonomous vehicle technology in dynamic urban environments and applies it to vertical scenarios. Cowarobot recently announced the completion of a USD250-million Series C financing round. Chery and Cowarobot collaborated on a public road test project in Wuhu and Shanghai as early as 2019. This project was built on Chery's NEV and worked well with Cowarobot's automated vehicle system.



[2021 SEMA Expo Highlights] Automakers highlight accessories at 2021 SEMA expo

IHS Markit perspective

Implications

As with other automotive expos in 2020 and 2021, the annual SEMA (Specialty Equipment Manufacturers' Association) event scheduled for November 2020 was cancelled due to the COVID-19 pandemic. This year, the show is scheduled to be held from 2 to 5 November with COVID-19 protocols in place. Among the automakers that have shared their plans ahead of the event are Ford, GMC, Honda, Nissan, and Stellantis.

Outlook

The show focuses on the aftermarket and accessories business, although automakers have often used the event to highlight and inspire consumers and aftermarket companies with versions of their latest and most exciting models. With traditional auto shows continuing to be under pressure, several automakers are leveraging the 2021 SEMA event to show off key models. SEMA was once heavily skewed towards street and racing performance cars, but in recent years, the show has reflected consumers' interest in outdoor overlanding and off-roading with accessories for already-capable utility vehicles to go further or to carry more stuff.

Automakers including Ford, GMC, Honda, Nissan, and Stellantis have shared their show plans ahead of the 2021 SEMA (Specialty Equipment Manufacturers' Association) expo in the United States this week. The annual show, cancelled last year, is being held, with coronavirus disease 2019 (COVID-19) protocols in place, at the Las Vegas Convention Center, Nevada, on 2–5 November.

As with other automotive expos in 2020 and 2021, the annual SEMA event scheduled for November 2020 was cancelled due to the COVID-19 pandemic. With COVID-19 protocols in place, this year's show focuses on the aftermarket and accessories business, although automakers have often used the event to highlight and inspire consumers and aftermarket companies with versions of their latest and most exciting models. Several automakers will leverage the 2021 SEMA event to show off key models. Among the automakers that have shared their plans ahead of the event are Ford, GMC, Honda, Nissan, and Stellantis. SEMA was once heavily skewed towards street and racing performance cars, but in recent years, the show has reflected consumers' interest in outdoor overlanding and off-roading with accessories for already-capable utility vehicles to go further or to carry more stuff.

Honda will have something for both its traditional sporty compact car fans and the overlanding crowd, continuing to have a strong presence at the show. There will be seven vehicles, including the Civic, Passport, Ridgeline, and motorcycles. Supporting the ongoing rollout of the 11th-generation Civic and the recently revealed Si model, the HPD (Honda Performance Division) Civic Si racing car to be displayed is an entry-level prototype for touring racing. Also to be displayed is a Team Honda Research West Civic Si car set up to race later in 2021 at an event called 25 Hours of Thunderhill. The prototype previews the brand's expectations for a turnkey, race-ready Si with a turbocharged engine and 6-speed manual transmission. The Si racing car prototype forgoes a sunroof, sound-proofing insulation, underbody coating, and seam sealer to reduce weight and aid in roll-cage installation. To make it race-ready, a selection of HPD and other performance and safety components are installed. These include a performance-tuned, production-based ECU from HPD, a racing limited slip-differential developed with Cusco and HPD, and a turbo-back dual outlet exhaust from Borla. The chassis has upgrades from HPD, Bilstein, Eibach, and Wilwood and Pagid for brake upgrades. The Team Honda Research West Civic Si race car was developed and tested by Honda employee volunteers involved in design, engineering, manufacturing, marketing,



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and finance, Honda said, and it will be raced by Honda employees. In addition, Honda will have a 2022 Civic hatchback on display decked out with accessories designed to celebrate its partnership with Team Liquid, a professional e-gaming organization. Most components on the Team Liquid Civic are from HPD or the Honda Genuine Accessories catalog, compared with the SEMA vehicles that leverage and display more aftermarket brands and partners. A Civic Si will also be decked out by HPD with performance and genuine accessory parts; a total of four Civic vehicles with various levels of accessorisation or modification will be displayed. With an all-new Civic, the idea is to inspire owners to accessorise. Other Honda vehicles on display aimed at enhancing the adventure image of current products include the Passport TrailSport Rugged Roads Project 2.0 and the Ridgeline HPD Trail Tour Project Vehicle. Both are part of Honda's overall efforts in recent years to improve its image relative to off-road capability. The TrailSport Rugged Roads Project 2.0 enhances the features that support Honda's new TrailSport subbrand, largely from the Honda Genuine Accessories catalog. The Ridgeline starts with the HPD option package and adds bed and rooftop accessories, stainless steel underbody skid plates, and a suspension lift kit from Jsport.



2022 Honda Civic Si HPD prototype racing car.
Picture courtesy of American Honda



2022 Honda Passport TrailSport Rugged Roads 2.0.
Picture courtesy of American Honda



2022 GMC Hummer EV pick-up.
Picture courtesy of GMC



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At the SEMA expo, **GMC** will attempt to woo the aftermarket crowd and introduce what could be possible with a full-size electric vehicle (EV) pick-up and SUV, with three vehicles “showcasing a comprehensive range of accessories from a portfolio of almost 200 products”, GMC says. There will be three Edition 1 models; one will be the GMC Hummer EV SUV and two will be the Hummer EV pick-up. One of the EV pick-up trucks will be displayed in production specification, with the other to be complemented with “dozens” of available accessories, “highlighting the functional, lifestyle and aesthetic possibilities for the revolutionary EV supertrucks”, according to GMC. Also on display will be a Chip Ganassi Racing Extreme-E electric off-road race vehicle, with looks to be inspired by the Hummer EV. GMC notes the Hummer accessory portfolio items were designed in parallel with the vehicles, taking a page from the Stellantis Mopar book, which leads to tailor-made fitment and production-specification validation. GMC will also display accessories not on the truck, including a 50-inch, roof-mounted off-road light bar, power-retractable hard tonneau cover, off-road recovery kit, and front off-road auxiliary lights. While many automaker-displayed vehicles at SEMA integrate components from aftermarket brands, the GMC Hummer displays feature General Motors (GM) components; the vehicle and vehicle segment are new enough that the aftermarket sector has not had access or time to develop solutions, and although interest is high, initial volumes are low enough that the aftermarket companies may build for it slowly. Displaying the products at the 2021 SEMA show is an effort to inspire both consumers and the aftermarket industry.

Ford is in full launch mode for the Bronco and Bronco Sport, leveraging most industry and consumer opportunities in 2021 to highlight these two vehicles (along with the Ford F-150 Lightning EV truck, which does not make an appearance at the 2021 SEMA expo). Similar to other automakers, Ford is displaying several custom and project Broncos and Bronco Sports, with six custom builds which Ford commissioned from aftermarket builders; these vehicles also showcase factory-installed Ford Performance Parts components and dealer-installed and aftermarket accessories. Ford is also showing some new Bronco accessories that enhance an already formidable off-road capability, including a new front-wheel-drive unit, which supports up to 5.28:1 gears; new off-road wheels; and performance tuning for the 2.3-litre EcoBoost engine. The efforts are part of both new-vehicle launches and especially important as Ford is creating a distinct brand with the Bronco. The Ford display will have four custom Broncos and two Bronco Sport vehicles, aligned with the likelihood that more Bronco owners will accessorise than Bronco Sport owners. Both vehicles are strong canvases for those looking to the aftermarket to customise for specific use cases. Ford states that the components on display are available at the [Accessories.Ford.com](https://www.accessories.ford.com) web site. The Bronco, in particular, was designed from the start with a modular approach meant to enable quick, easy, and thorough personalisation. Ford custom builds include the Bronco RTR Fun-runner, starting with a two-door Badlands Bronco and adding cosmetic accessories and functional elements, including an Ultimate Dana 44 FDU front axle with Spicer Extreme CV shafts, long-travel spec Ultimate Dana 60 semi-float rear axle and a performance intake. BDS Suspensions created a first responder vehicle, starting with the two-door Black Diamond series. The vehicle is designed as the ultimate fire truck, including a modified half-truck hardtop. Upgrades include CrawlTek Revolution bumpers with recessed winch mount, recovery hooks, and front belly skid and winch mount and recovery hooks in the rear. While Ford had been expected to bring a pick-up companion for the Bronco, indications are the project had been scrapped. However, Ford is likely to watch reaction to this truck closely. A company called Tucci Hot Rods has converted a Bronco to a quad-track snow adventure vehicle, including B-series tracks in place of all-terrain tyres. Finally, both the founder and the co-owner of BAJA FORGED created a project from the Bronco four-door. One started with the Outer Banks, with a focus to modern amenities, including onboard fridge, premium sound bar and cargo organizer, as well as deliver off-road adventure. The BAJA FORGED version also got a three-inch lift kit. A second BAJA FORGED Bronco Sport started with the Badlands series and added accessories for improved off-road credibility, including a two-inch lift kit.



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2021 Ford Bronco FunRunner concept.

Picture courtesy of Ford



2021 Ford Bronco BDS project.

Picture courtesy of Ford

Nissan has an all-new Pathfinder, Frontier, and Z sports car to pitch in 2021 and 2022. The automaker's 2021 SEMA display will feature Project Overland Pathfinder and Project Overland Frontier, as well as the Nissan Z Proto Spec show property, shown at previous events. The Project Overland Pathfinder adds a prototype NISMO off-road 2-inch lift kit with Bilstein gas-pressurised shocks and custom 18 x 8 inch NISMO off-road wheels with Maxis RAZR AT tyres. The display Pathfinder also sports a prototype NISMO off-road expedition roof rack, NISMO off-road 6-inch driving lights, custom fabricated rack rails, custom front bumper guard with driving lamps, and a specific hitch carrier with a built-in table. With this, Nissan is demonstrating more of its internally developed parts than those of aftermarket partners. Nissan says many of the NISMO elements can be ordered beginning in the second quarter of 2022. The Project Overland Frontier has more comprehensive chassis upgrades, including NISMO off-road performance suspension kit, with a 2-inch lift in the front; SPC front upper control arms with eAxis sealed flex joints; NISMO off-road performance shock absorbers; custom NISMO off-road rear leaf springs with 2-inch lift; and 17-inch wheels with Maxis RAZR MT tyres. The Frontier also includes a list of exterior modifications, from lights to bed rack, roof rack, rooftop tent, and cargo boxes for carrying equipment on trails. As with the Pathfinder, many components will be available from early 2022.



2022 Nissan Project Overland Pathfinder.

Picture courtesy of Nissan



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2022 Nissan Project Overland Frontier.

Picture courtesy of Nissan

Stellantis, in its former FCA form, often participated at SEMA, a natural fit, particularly given the strength of its Mopar accessories business. In 2021, Mopar will show concepts based on Jeep, Ram, and Dodge brand vehicles. From Jeep, concepts include a highly accessorised Wrangler 4xe plug-in hybrid electric vehicle (PHEV), a Wrangler Overlook concept based on the four-door Sahara model, and a Grand Cherokee L Breckenridge, designed for trips to the mountains and ski resorts. The Breckenridge has exterior cosmetic accessories and a roof-mounted Thule cargo box on dual Mopar crossbars for skis and snowboards. The Wrangler Overlook extends the cabin by 12 inches to add a third row of seats and has a custom modular roofline five inches taller for better headroom. The Overlook also has 20-inch wheels, a Jeep Performance Parts (JPP) 2-inch lift with Fox shocks, a JPP stamped steel front bumper with improved approach angle, among other functional and cosmetic accessories. The 4xe concept includes the JPP 2-inch lift with shocks tuned for the heavier 4xe, custom underbody rock lights, a JPP stamped steel bumper with winch protector, and JPP Gorilla Glass windshield. The 4xe concept has an Ivory Pearl exterior that includes JPP tube doors, JPP rock rails; original-production black elements have been painted gray; and there is a distinct Mopar Blue Katzkin leather interior. For the Ram TRX, there is a TRX RexRunner concept, which, among other touches, beefs up the rugged exterior, adds a RamBar accessory bar with 14-inch LED lights, and adds metal skid plates front and rear, improving the approach angle. The Ram 1500 Outdoorsman concept is designed to go from job to outdoors more easily. The concept starts with the Big Horn crew cab, and adds Mopar graphics and eye-catching colours. However, it is really about the accessories that increase functionality, including concept two-height-position aluminium Mopar bed rack system; a bed-slide system with dual rolling panels for easier loading and unloading of contents; and Mopar bed rails with adjustable cleats. The concept also has a Mopar 2-inch lift kit and Fox shocks. Although the SEMA show was once dominated by muscle cars, Stellantis is displaying only one Dodge Challenger. At the 2021 show, there is a Holy Guacamole concept, which starts with the limited-production R/T Scat Pack Widebody 50th Anniversary edition and gives it a heritage-look colour, shaker hood scoop, staggered 20-inch wheels and Mopar coil-over suspension-lowering kit. The interior's wood panel trim and green and yellow plaid inserts in the seats and door panels are meant to pay tribute to colours and materials from the original 1970 Challenger.



Ram 1500 Outdoorsman Concept.

Picture courtesy of Stellantis



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2022 Jeep Wrangler 4xe Concept.

Picture courtesy of Stellantis

Outlook and implications

The SEMA show focuses on the aftermarket and accessories business, although automakers have often used the event to highlight and inspire consumers and aftermarket companies with versions of their latest and most exciting models. With traditional auto shows continuing to be under pressure, several automakers are leveraging the 2021 SEMA event to show off key models. SEMA was once heavily skewed towards street and racing performance cars, but in recent years, the show has reflected consumers' interest in outdoor overlanding and off-roading with accessories for already-capable utility vehicles to go further or to carry more stuff. In 2021, this trend continues, exemplified by Ford highlighting the Bronco and Bronco Sport, with no Mustang presence; Stellantis only showing one Dodge car; and Honda augmenting the all-new Civic with truck and utility vehicle concepts.

Overall, the automakers participating in this event have been consistent, and the vehicles and accessories displayed are consistent with brand priorities. Several also pay homage to the past with modified versions of historically important models, although these are less relevant to today's production and sales and they are not detailed in this report. The event focuses on showing vehicles as canvases that owners can tailor to their lifestyles and vehicle hobbies and passions, and is less about the practical side of transportation.



[Sales Highlights] Chinese EV startups Xpeng and Li Auto post substantial growth in sales, NIO registers decline during October

IHS Markit perspective

Implications EV startups in China have been riding the new energy vehicle (NEV) wave in the country. The 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.

Outlook IHS Markit forecasts sales of NIO, Xpeng, and Li Auto vehicles will be around 91,400 units, 72,000 units, and 73,000 units respectively during 2021.

Chinese electric vehicle (EV) startups Xpeng and Li Auto have reported substantial increases in vehicle sales during October, while EV maker NIO has registered a sales decline during the month.

Xpeng reported deliveries of 10,138 vehicles in October, a 233% year-on-year (y/y) increase, making deliveries of over 10,000 units for a second month in a row. In October, the EV startup's deliveries included 6,044 units of the P7, the sports smart sedan, and 3,657 units of the G3 and G3i smart compact sport utility vehicles (SUVs). Sales of the P5 sedan launched in September were 437 units last month. In the year to date (YTD), Xpeng's cumulative deliveries stood at 66,542 units, up 289% y/y.



During October, Li Auto posted 107.2% y/y growth in sales of the Li One SUV to 7,649 units, the only model launched by the company so far. In the YTD, the startup's deliveries stood at 62,919 units. Yanan Shen, co-founder and president of Li Auto, said, "It took us 708 days to reach the production milestone of 100,000 Li ONEs, making us the fastest to achieve this among emerging NEV manufacturers in China."

Meanwhile, NIO said that its EV deliveries in October declined by 27.5% y/y to 3,667 units due to restructuring and upgrades of manufacturing lines and preparation for launches of new products.

Outlook and implications

EV startups in China have been riding the new energy vehicle (NEV) wave in the country. The 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. According to a recent statement by the China Association of Automobile Manufacturers (CAAM)'s executive vice-chairman, Fu Bingfeng, Chinese NEV sales are expected to increase by more than 40% each year for the next five years.



Xpeng, Li Auto, and NIO have all been focusing on technology development, new vehicle launches, and the expansion of sales points in China to gain a firmer foothold in the Chinese NEV market. NIO and Xpeng are working towards expanding their production footprint 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. Separately, earlier this year, Li Auto set up a new subsidiary to produce NEVs. Called Beijing Li Auto Co Ltd, the new entity has a registered capital of CNY1 billion and focuses on manufacturing new smart NEVs, refitted smart NEVs, mobile charging vehicles, and NEV-related powertrains. The automaker aims to have a total of more than 200 direct retail stores by the end of this year. As of 31 October, the company had 162 retail stores in 86 cities.

IHS Markit forecasts sales of NIO, Xpeng, and Li Auto vehicles will be around 91,400 units, 72,000 units, and 73,000 units respectively during 2021.

[Sales Highlights] Great Wall's net profit surges 91.1% y/y in Q1–Q3

Great Wall Motor (GWM) has reported 91.1% year on year (y/y) surge in its net profit attributable to the shareholders of the company during the first three quarters of 2021 to CNY4.95 billion (USD772 million), reports Gasgoo. GWM's revenues jumped by 46.1% y/y during the period to CNY90.80 billion, according to the report. The company posted a 29.9% y/y increase in new vehicle sales during the period to 884,000 units. In the third quarter alone, the automaker's revenues grew by 10.1% y/y to CNY28.87 billion. However, GWM's net profit went down by 1.7% y/y to CNY1.42 billion in the quarter.



Outlook and implications

The strong growth in GWM's net profit during the first nine months of 2021 came on the back of strong sales and a low base of comparison. Chinese automakers' financial results were hit hard during the same period last year – especially the first quarter – because of the coronavirus disease 2019 (COVID-19) virus pandemic, which severely affected sales and production and forced automakers to suspend operations. However, the global semiconductor shortage issue did weigh on GWM's results during the first three quarters of 2021 and it is expected to have an impact in the remaining months of this year. GWM announced in June that it is aiming to sell



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4 million vehicles annually by 2025, with revenues expected to reach CNY600 billion. The automaker continued to expand its global footprint during the past quarter, entering the Egyptian, Bruneian, and European markets. The company has stated a goal of selling one million vehicles in overseas markets in 2025. GWM sold 98,000 vehicles outside of China from January to September, up 136.3% y/y, accounting for 11.1% of its total vehicle sales. In Thailand, the HAVAL H6 hybrid vehicle commanded 33.2% of the market in September, making it the country's best-selling C-class sport utility vehicle (SUV). GWM sold 3,513 vehicles in Russia in the same month, up 147% y/y, highlights the report. Furthermore, GWM expects its new energy vehicle (NEV) sales to account for 80% of its total annual sales by 2025. To help ensure an uninterrupted supply of batteries for GWM's NEVs in the Chinese market, the automaker has signed a framework agreement on a 10-year partnership with Chinese battery manufacturer Contemporary Amperex Technology Co Ltd (CATL) to develop NEV technologies.



[GSP] South America Sales and Production Commentary -2021.10

South America sales

September 2021: -12.8%; 301,000 units vs. 281,000 units

YTD 2021: +23.5%; 2,713,000 units vs. 2,197,000 units

Spring in the Austral Hemisphere did not allow for a thawing of light vehicle sales in Brazil and Argentina, the markets of which slid year on year (y/y). This is Brazil's fourth continuous month-on-month (m/m) contraction. There is a somewhat different environment in Chile, Colombia, and Peru, where the presence of Chinese OEMs is much larger thus deflecting some of the inventory limitations the semiconductor crisis has brought. Nevertheless, they are likely to experience similar bottlenecks in the coming months. The good news is that COVID-19 case counts have decreased in the region, and the economies are experiencing a recovery. This will allow for pent-up demand once the dearth of products in showrooms around the world normalizes. The bottleneck on the production side will likely extend well into 2022.

South America's year-to-date (YTD) figures remain solid, having expanded by close to one-fourth relative to 2020 during the first three quarters of the year to 2.7 million units (although the 2020 base is low given the COVID-19 pandemic). IHS Markit analysts will closely watch the situation in Argentina, where a midterm election may create uncertainty in demand in coming years. Currently, there is a fading effect owing to the gap between the blue dollar and the official exchange rate. Consumers are swapping their dollars in the black market at a rate of ARS180/USD1, but cars are sold at the official exchange rate of ARS98/USD1, which makes the operation more than one-third cheaper. Also important, Brazil's seasonally adjusted annual rate (SAAR) closed below 1.7 million in September, the lowest of the year, as a result the constraint in inventory as Brazilian production has also been hit by supplier constraints.



The macroeconomic model for Brazil signals toward sales of 2.2 million units in 2021. The affordability model suggests a market around 1.9 million units. IHS Markit analysts anticipated sales would break the 2.4-million-unit milestone last December. IHS Markit analysts had to revise the forecast downward five times in 2021 to under 2.0 million units owing to the absence of product created by the limited availability of semiconductors and raw materials.

Sales within the region were at 4.5 million units in 2019; not an all-time high, but this is the benchmark being used globally for how long it will take to recover from COVID-19. IHS Markit analysts estimate that 2020 closed with sales of 3.2 million units and will climb toward 3.5 million units in 2021. The long-term outlook projects sales to approach 5.0 million units by 2026 as the region heals.



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South America production

September 2021: -14.7%; 213,005 units vs. 249,817 units

YTD 2021: +28.6%; 1,905,414 units vs. 1,482,151 units

Following in the steps of the weak month of July, volumes suffered another pronounced decline in September 2021 in South America, with about 213,000 units built—down 14.7% over September 2020. The main culprit for this decrease remained the ongoing semiconductor supply crisis that is affecting manufacturers throughout the globe. Still, on a year-to-date (YTD) basis, South American volumes kept trending upward 28.6% year over year (y/y), slightly over 1.9 million units. Unfortunately, the difficulties within the supply chain will likely linger (if they do not worsen) in the coming few months and continue suppressing performance well into 2022.



[Supplier Trends and Highlights] Analysis of software R&D growth in the automotive industry

The global automotive industry is spending more on research and development (R&D) than ever before, as vehicle manufacturers (OEMs) and tier-1 suppliers are trying to stay ahead of a rapidly shifting market and fierce competition from the technology industry.



Source: Getty Images/Jackie Niam

R&D spending by the automotive industry is growing again after a steep decline in 2020. April data from the IHS Markit global automotive R&D survey show automotive companies are increasing their R&D spending by 6.5% compared with 2020. Greater China and Chinese automotive companies are leading the R&D investment, both in the short and medium terms. The R&D pushes were visible in many products and concept launches at the 2021 Shanghai Auto show, with OEMs and suppliers boasting intelligent automobile solutions, future cockpit solutions, 4D imaging radar, augmented reality heads-up displays (AR-HUDs), and AI-based automotive-grade supercomputers, all of which will make the vehicle beyond science fiction to reality.

The automotive industry has been a constant innovator of new products and is the pillar of the economy, job creation, and a leader in driving cutting-edge technology research. Investment in new technologies is making vehicles more efficient, more interactive, running on new fuels, and even begin to drive themselves. This trend is growing faster than sales and revenue, amid a period of technological disruption not seen in the industry for many decades.

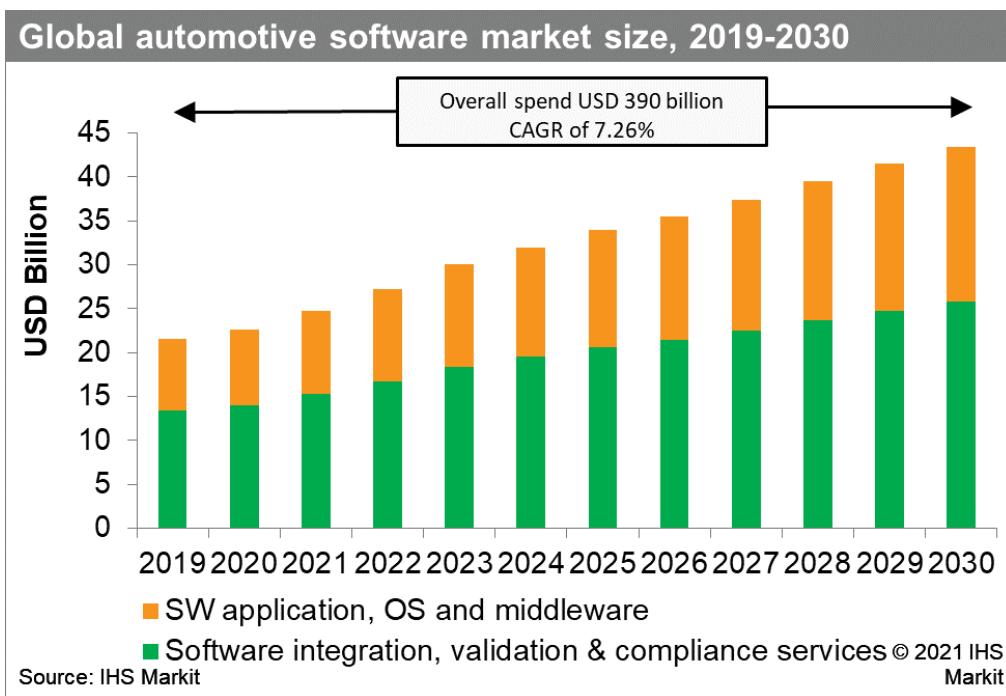
Innovation in the automotive industry is retaking center stage, and many of the software innovations are moving from luxury to commodity solutions. Therefore, the importance of having a competitive advantage over one another is becoming vital. Modern vehicles boast in-car entertainment and connectivity controlled by more than 100 million lines of software code—more than any other single application in other industries—and are powered by smaller and more efficient engines, supplemented by electric batteries or hydrogen. Caught between ever-tougher emission legislation, customer demands for better-connected vehicles, and unprecedented competition from technology providers, automotive industry leaders are attempting to rebrand themselves as innovators rather than manufacturers and are investing more in R&D than any other industry worldwide. That spending is paying dividends. Global patent filings for low-emission engine, connected car, and autonomous vehicle technologies by carmakers have doubled over the past five years. For example, The Ford Motor Company, Toyota Motor, and General Motors (GM) have issued 6,054, 5,349, and 3,193 patents on automotive technologies, respectively.

Looking into 2030, automotive companies expect new customers and new preferences on the horizon, which will change how they sell vehicles. Customers expect car companies to provide them with a seamless customer journey, and that includes a seamless car buying experience. Even as they switch between the channels, new



customer profiles and data are available at all touchpoints, and all points need to offer a consistent brand experience. The customer can go through the entire process online, off-line, or both. In this scenario, the benchmark is not automotive companies themselves, but rather true digital players, especially in the digitalization process. COVID-19 has accelerated the trend toward online purchasing, including in the automotive industry, and this trend is here to stay. Furthermore, the modern functional decomposition of new features, such as electrified vehicles, autonomy, and connected mobility, is changing the relationship between OEMs and their suppliers. To shape this change, automotive companies are rethinking the strategies around technical development. Although the current product development process starts with vehicle hardware, the focus is shifting, placing software development right at the forefront.

The effect of the Connected Autonomous vehicles, along with the supporting electrical architecture evolution, fuels significant growth of the automotive software market. Furthermore, the requirements and user scenarios of the ACE (Autonomous Connected Electric vehicle) significantly influence the growth of automotive software content in the vehicle. While the global automotive market is expected to grow from USD2,163 billion in 2020 to USD3,152 billion, the software content size will grow at a rate of 7.26%, with a total market size of USD389 billion between 2019 and 2030 (cumulative). IHS Markit analysts predict the global software content market size will become USD43 billion by 2030.



With a compound annual growth rate (CAGR) of 8.3%, power electronics has the largest growth rate. This is due to higher investments by OEMs in battery-electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEVs), hybrid electric vehicles (HEVs), as well as existing internal combustion engine (ICE) start-stop powertrain improvements. Growth in software (both in application development and software system validation) and sensor electronics is primarily driven by autonomous vehicle technology development requiring advanced software functionality, such as data and sensor fusion, deep machine learning using a neural network system, and intelligent object detection for light detection and ranging.



Furthermore, the market is still witnessing challenges with autonomous system validation. On one side, there is a lack of actual use cases and requirements from OEMs; on the other side, suppliers do not have complete data to carry out complete training (data is owned by OEMs). As a result, tier-1 suppliers are spending more to use the external resource to develop simulation scripts for system validation. Therefore, costs of software integration and validation, as well as SAE level certification in autonomy, will continue to rise within the medium-to-long term.

Another software cost growth factor is the hardware consolidation. In the medium-to-longer term, all automotive software projects have to integrate various levels of function-specific software stacks into single electronic control unit (ECU) hardware. In the current vehicle environment, to accomplish a single use case, functions are routed through different communication bus protocols that is connected to various ECUs.

For example, to implement assisted parking with a 360° 3D view, sensors, vehicle control, and human-machine interface (HMI) sit in different ECUs, operating services, and communication bus networks, such as FlexRay, MOST/ethernet, and CAN. As the consolidation of hardware further progresses, the current embedded software requirements, as well as applications, need to go through a churn to support integrated functionalities. Therefore, the cost of application software, middleware, and operating service development will also significantly increase.

Software development around connected cars is growing, especially as the industry is engaged to solve the challenges in the app developer ecosystem. OEMs are focusing on the development of an ecosystem (both onboard and offboard) that will allow developers to contribute with app content. An interesting challenge remains how to regionalize the content while keeping the underlying software and ecosystem the same.

CAGR comparison – Software vs. electronics hardware

Components	CAGR 2020 - 2030
Software application (function stack, middleware, OS)	+7.91%
Software integration, validation & compliance certification	+6.83%
Power electronics (excluding battery cells)	+8.30%
Sensor electronics (camera, radar etc.)	+5.40%
ECUs (EPAS, Chassis, keys, AMPs, Head unit, Instrument Cluster, display etc.)	+4.28%
Others (harness, junction box, Body control, door & seating control electronics)	+3.14%

Note: effect of domain controller is excluded in the growth comparison calculation & study

Source: IHS Markit

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Growth in software R&D

The proliferation of autonomous, connected, and electrified vehicle technologies (ACE) will continue to be among the top automotive trends in 2021, which will continue to increase the already soaring costs of R&D. Furthermore, several macro trends will continue to contribute to the disruption of future automotive software. OEMs and



suppliers are trying to tap into several advances that were made in recent years, such as the mainstreaming of cloud-native applications into the vehicle environment, software-as-a-service, and use of data as the basis for business range.

Given the increasing R&D costs and associated technological challenges, many companies are strategically planning to utilize emerging technologies as cost effectively and profitably as possible to optimize their R&D activity. Prioritizing R&D activities, securing talent required to develop cutting-edge technologies, and collaborating with other industry experts are the key strategic considerations.

Companies have spent an average of 3% of their net sales in software R&D between 2017 and 2020. Growth is hurt by the COVID-19 pandemic between 2020 and early 2021, when the automotive industry went through a major shutdown. Many companies have curtailed longer-term innovation projects to adjust their spending budget.

[Supplier Trends and Highlights] Velodyne Lidar showcases automotive lidar solutions at Auto Guangzhou 2021

Velodyne will showcase the classic Puck series and Alpha Prime, as well as advanced solid state lidar sensors, Velarray H800 and Velarray M160



Source: Gettyimage/toxawww

Velodyne Lidar will demonstrate its innovative lidar solutions at Auto Guangzhou 2021 (Hall B, Booth C11) from 19–21 November in Canton Fair Complex, Guangzhou, China, according to a press release on Business wire dated 28 October. The theme of Auto Guangzhou 2021 is "New Technology, New Life," which aims to fulfil people's automotive dreams. The autonomous and intelligent driving exhibition will focus on displaying advanced technologies and innovative products from the automotive industry around the world.

Velodyne will showcase the classic Puck series and Alpha Prime, as well as advanced solid state lidar sensors, Velarray H800 and Velarray M1600.

Velodyne provides the best long-range sensor for autonomous mobility with the Alpha Prime. The Alpha Prime's world-class combination of range, image clarity, and field of view reliably and precisely detects roadside objects. With advanced sensor-to-sensor interference mitigation, power efficiency, and thermal performance, this cutting-edge sensor generates a high-quality point cloud in a wide range of light conditions.

Velodyne's solid-state technology The Velarray H800 lidar sensor is designed for automotive use. Velodyne's proprietary MLA is used to construct the sensor. The Velarray H800 is designed for safe navigation and collision



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avoidance in ADAS and autonomous mobility applications to achieve advanced driver assistance. It has combined long-range perception and a broad field of view

The Velarray M1600, which is built with Velodyne's MLA, has excellent near-field perception for safe navigation, allowing touch-free movement and last-mile delivery robots to operate autonomously and safely without human intervention. This robust and compact sensor can be deployed in a variety of environments and weather conditions, and it can be used in nearly all weather conditions throughout the year.

Outlook and implications

Velodyne Lidar is dedicated to promoting safe mobility by developing cutting-edge lidar solutions. Velodyne offers cutting-edge products, technologies, and solutions in advanced driver assistance systems (ADAS), autonomous vehicles, robotics, smart city infrastructure, delivery, and industrial applications, among others. Velodyne, in particular, empowers electric vehicles (EVs) and vehicle automation to enable safe and autonomous mobility.

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