

Automotive Industry Weekly Digest

21February – 25February 2022

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[OEM Highlights] Apple supplier Luxshare Precision to form JV with Chery on NEV production

Apple supplier Luxshare Precision has signed a strategic co-operation framework agreement with Chinese automaker Chery on 11 February, and they plan to form a joint venture (JV) to engage in the development and manufacturing of new energy vehicles (NEVs), reports cnevpost.



Outlook and implications

In a company filing to Shenzhen Stock Exchange, Luxshare said the JV will combine the two companies' resources and expertise to support Luxshare's effort to become a Tier-1 supplier in the automotive component sector and explore contract manufacturing opportunities for OEM clients. Luxshare is one of the most prominent suppliers in Apple's supply chain. The company supplies a range of components to Apple including connection cables, internal iPad cables, MacBook power cables, Apple Watch wireless charging bands, and MacBook Type-C and iPhone adapters. As part of the agreement, Luxshare will acquire a 6.24% share in Chery New Energy, the automaker's NEV division, and a 7.87% share in Chery Auto.

[OEM Highlights] New Smart model to be called #1

Smart has announced that its first model under joint venture (JV) ownership between Mercedes-Benz and China's Geely will go under the #1 nameplate, according to an Automotive News Europe (ANE) report. The #1 will be the first model launched under the brand's co-ownership with Geely, with production at Geely's factory in Gian (China). The hashtag naming convention will be used by the brand going forward, and is designed to be "evocative of trendsetting in the digital era." The company also showed a prototype image of the new car which appeared more of a conventional passenger car design, with a slightly raised ride height after the company said its first new generation design under the Geely JV would be a sport utility vehicle (SUV), with the car close to the concept #1 shown at last year's Frankfurt Motor Show. Vice-president of global sales and marketing Daniel Lescow said, "As the first product set to launch following the brand's renewal, the Smart #1 perfectly combines electric-drive technology and premium quality."



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Outlook and implications

The new model will be something of a departure from the original concept of the Smart ForTwo which was originally launched in 1998. The concept shown in Frankfurt last year was solidly a B-segment model with a length of 4290 mm, in comparison to the original 3,495-mm long Smart ForTwo which was a two-seater, while the #1 has four doors and four seats. The prototype's styling has hints of the Mini Electric and that car is likely to be a key competitor to the #1 when sales start. IHS Markit is now part of S&P Global expects 16,000 units of the new model to be manufactured at the Gian plant before the end of this year.



[EV & Energy Efficiency Highlights] Shanghai leads the way on Chinese NEV adoption

IHS Markit now a part of S&P Global perspective

Implications Shanghai is leading the way on EV adoption among Chinese cities. By the end of 2021, cumulative sales of NEVs in Shanghai reached over 677,000 units, the highest in the country.

Outlook The government's efforts to build more EV charging facilities will continue this year and much of the focus will be placed on better integrating battery-swapping stations into the city's public charging network.



Photo courtesy of Stephanie Brinley

New energy vehicle (NEV) sales, including battery electric vehicles (BEVs) and plug-in hybrid vehicles (PHEVs), accounted for 43% of new vehicles sold in Shanghai during 2021, according to data released by the Shanghai Economy and Informatization Commission. In 2021, sales of NEVs reached 254,000 units in Shanghai, up 105% year on year (y/y), and Shanghai leads the way on EV adoption. By the end of 2021, cumulative sales of NEVs in Shanghai reached over 677,000 units, the highest number among Chinese cities. The goal of the local government is not just to electrify its transportation system but also make Shanghai a production hub for EVs. Mayor Gong Zheng said during a recent press conference held by the municipal government of Shanghai, that the city aims to bring its total NEV production output to 1.2 million units by 2025 and for BEVs to account for more than 50% of new vehicle sales. Official data suggest that Shanghai's new vehicle production output totalled 2.833 million units last year, marking an increase of 7% y/y. Of this total, production volume of NEVs reached 632,000 units, an improvement of 160% from 2020. The NEV sector also contributed significantly to Shanghai's manufacturing industry in terms of industry value increase. In 2021, total industry value of NEV manufacturing surpassed the CNY100-billion mark for the first time, reaching CNY177.26 billion (USD278 billion).

To encourage adoption of NEVs, Shanghai has invested heavily in EV charging infrastructure. By the end of November 2021, Shanghai already had a public charging network with more than 100,464 EV chargers, and 84 battery swap stations. Gong said the government's effort to build more EV charging facilities will continue this year, and that much of the focus will be placed on better integrating battery-swapping stations into the city's public charging network. In 2021 alone, Shanghai has added 50 new battery-swapping stations.

Outlook and implications

According to data compiled by local media using new vehicle insurance data, the Tesla Model Y and Model 3 are the best-selling passenger NEVs in Shanghai, followed by the Roewe RX5, BYD Han EV, NIO ES6 and VW ID.4 X. These top-selling models, which are predominantly BEVs, except for the Roewe RX5, and have a price tag above CNY150,000, indicate BEVs are entering the mass market of Shanghai with adoption led by private car



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buyers. The city's success in transitioning its transport system to low-emission vehicles is built on a mix of factors, including effective preferential policies, an expanding EV charging network, and a strong economy that leads to higher purchase power of consumers.

With regard to preferential policies, Shanghai does not provide local-level subsidies on passenger BEVs and PHEVs, however, NEV buyers enjoy a much shorter waiting time in applying for a licence plate while those intending to buy an ICE model have to bid for a licence plate through a monthly auction system, which many car buyers deemed a painful process as it could take months or even up to a year to get one. Shanghai's push to expand its public charging network also helps encourage NEV adoption among consumers. The city has the second largest public EV charging network across China, lagging only behind Guangdong province. NIO is the largest operator of battery-swapping stations in China; it has more than 800 battery-swapping stations in China, of which 72 are located in Shanghai.

Tesla's presence in Shanghai with its Gigafactory Shanghai, and SAIC-VW's MEB plant, have greatly raised the public's awareness of low-emission vehicles. The automaker last year made more than 480,000 vehicles at the Gigafactory Shanghai as the largest EV manufacturer in the city. At this stage, we are not aware of any major government-led marketing campaigns targeted BEVs or PHEVs, however, the growing numbers of NEVs on the roads are the best advertisement for such vehicles.

[EV & Energy Efficiency Highlights] China aims to provide charging infrastructure for 20 mil. EVs on roads by 2025

Chinese authorities will push for the expansion of the country's electric vehicle (EV) charging infrastructure in the next few years to meet demand for 20 million EVs on the road by 2025. According to gasgoo citing a statement issued by several Chinese governmental departments including the National Development and Reform Commission (NDRC), China will improve the public charging network in central urban areas, boost the construction of public charging facilities in peripheral urban areas, and deploy battery swapping stations based on local conditions of different regions. The authorities also urged the housing department to introduce regulations to facilitate the installation of EV chargers in residential buildings.



Outlook and implications



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The document issued by NEDC provides guidelines for local authorities to deploy EV charging facilities in their regions. The focus is to address issues like poor regulatory support for EV owners to install private chargers in their residential buildings, and the lack of EV charging stations in expressways and less developed rural areas. By the end of 2021, China had around 2.617 million EV charging facilities and 1,298 EV battery-swapping stations. The country's new energy vehicle (NEV) parc amounted to 7.84 million units by the end of 2021, according to the data from China's Ministry of Public Security.



[Forecast & Analysis Highlight] Chinese NEV sales growth continues to outpace broader passenger vehicle market in January

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Implications Growing demand for battery electric vehicles and plug-in hybrid vehicles from private car buyers has propelled retail sales volumes of passenger NEVs to reach 347,000 units in January, up 132% year on year (y/y), data from the CPCA shows.

Outlook The ranking for the top 10 NEV manufacturers in January looks familiar, as last year's top performers, including BYD, Tesla, and SAIC-GM-Wuling, continue to lead sales in the market. Chinese automakers' dominance in the NEV market is unlikely to be weakened by their joint venture counterparts during 2022.



Photo credit: Abby Chun Tu

China's passenger new energy vehicle (NEV) sector has started 2022 with strong sales growth in January. Growing demand for battery electric vehicles (BEVs) and plug-in hybrid vehicles from private car buyers has propelled retail sales volumes of passenger NEVs to reach 347,000 units in January, up 132% year on year (y/y), data from China Passenger Car Association (CPCA) shows. Wholesale volumes of passenger NEVs showed strong growth as well in January, with sales of 412,000 units, up 141.4% y/y. The data indicates that NEVs accounted for 16.6% of China's passenger vehicle sales in January, an improvement from 6.8% in the same month last year. The passenger NEV sector continues to outperform the broader passenger vehicle market, which witnessed a decline of 4.5% y/y in retail volumes last month to 2.112 million units. We have yet to receive data from the China Association of Automobile Manufacturers (CAAM), at the time of writing. The CAAM data will include sales volumes of passenger and commercial NEVs.

BYD, with retail sales of 92,788 units, secured first place in the ranking of the top 10 NEV manufacturers in January. BYD's Qin, Han, Song, and newly launched compact model, the Dolphin, are among the automaker's best-selling models in the NEV market. In comparison, SAIC-General Motors-Wuling, which came in second place in the top 10 sales rankings, relies primarily on the Wuling Hongguang Mini EV to generate most sales in the NEV market. Chery Auto reported a sales increase of 18.5% y/y to 19,451 units in January, and the automaker was the third-highest-selling NEV manufacturer thanks to the strong performance of its mini-size model, the QQ Ice Cream. Tesla ranked fourth with sales of 19,346 units. The US EV maker exported more than 40,000 units of its locally made vehicles from China in January, which dragged down the pace of vehicle deliveries to local customers. The EV makers in the top 10 list are show in the table below.

**China's top-10 NEV manufacturers by sales**

	Jan-22	Jan-21	Y/Y % change
BYD	92,788	20,240	358.4
SAIC-GM-Wuling	29,723	30,017	-1.0
Chery	19,451	6,820	185.2
Tesla	19,346	15,484	24.9
Geely	16,592	2,815	489.4
AION	16,031	7,356	117.9
Xpeng	12,922	6,015	114.8
Great Wall	12,821	10,260	25.0
Li Auto	12,268	5,379	128.1
Hozon	11,009	2,195	401.5

Source: CPCA© 2022 IHS Markit is now part of S&P Global

Outlook and implications

The ranking for the top 10 NEV manufacturers in January looks familiar, as last year's top performers, including BYD, Tesla, and SAIC-GM-Wuling, continue to lead sales in the market. Tesla has dropped out of the top three in the rankings as the EV maker prioritised exports from China last month to meet demand in overseas markets. The global semiconductor shortage has eased, although supply chain issues are expected to remain a constraining factor for automakers this year. According to local media reports, Great Wall has suspended reservations for its two electric models, the Black Cat and White Car. A Great Wall spokesperson confirmed the news on 16 February, saying that the decision had been made due to a lack of semiconductors and other components, which had caused significant backlogs of orders for the two models.

Chinese automakers' dominance in the NEV market is unlikely to be weakened by their joint venture counterparts during 2022. Chinese startup EV manufacturers, including NIO and Xpeng, are well poised to advance their sales this year with their expanding product line-ups. NIO is to begin deliveries of its flagship sedan, the ET7, in March. Production of NIO's smaller ET5, a model viewed as a strong contender to Tesla's Model 3, is due to begin in the third quarter. BYD is widening its NEV line-up with several new models, leveraging its e 3.0 platform. We will provide further analysis of China's new vehicle market once CAAM data for January become available.

[Forecast & Analysis Highlight] SAIC reports sales growth of 13% y/y in January

SAIC Motor has reported 13% year-on-year (y/y) growth in sales to 455,552 units in January, including the volumes of the group's joint ventures (JVs) and subsidiaries. Sales of SAIC VW, SAIC's JV with Volkswagen (VW), totalled 130,607 units in January, up 51.69% y/y. Sales of SAIC-GM, the group's JV with General Motors (GM), stood at 110,007 units last month, down 15.43% y/y. The SAIC-GM-Wuling JV's sales totalled 110,057 units in January, up 18.01% y/y. SAIC Maxus, SAIC's commercial vehicle (CV) company, sold 21,037 vehicles, up by 25.20% y/y. Sales of SAIC's wholly owned brands, Roewe, MG, and R, managed by SAIC Passenger

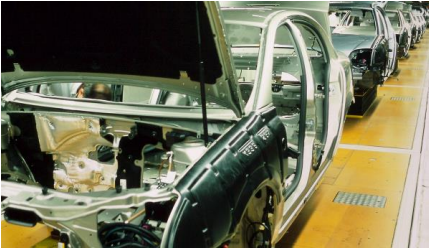


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Vehicle Company, increased by 18.02% y/y in January to 67,564. Sales of SAIC's Indian subsidiary, MG India, stood at 4,488 units in January, up 26.85% from 3,538 units in January 2021.



Outlook and implications

SAIC's sales in January were helped by a better performance by the SAIC-VW JV. The JV's sales declined 17.5% y/y last year owing to sluggish sales of VW-branded vehicles and production disruptions of semiconductor shortages. According to SAIC-VW's product plan, the JV will launch the all-new VW Lamando and the mid-cycle version of the VW Laida in the first half of 2022 to strengthen its sales in the sedan market. SAIC's sales report also suggests its new energy vehicle (NEVs), are in high demand last month; a total of 77,989 NEVs, including battery electric vehicles and plug-in hybrid vehicles, were sold by SAIC in January, up 29% y/y. The group has a comprehensive electrified vehicle product line in China, covering both sedan and sport utility vehicle markets. Models like the Wuling Hongguang Mini EV, the Roewe RX5 PHEVs and the MG EZS EV, are among its best-selling EVs.



[Technology & Mobility Highlights] Polestar shows Polestar 5 bonded aluminium platform

Polestar has announced a platform for the upcoming Polestar 5, developed in-house by the company's UK research and development team. The company says that the "bespoke aluminium" platform unlocks potential for class-leading dynamics, rigidity, and safety features. The company says that its team has developed an innovative manufacturing process that allows both the body and the platform to be built at the same time, reducing traditional lead times and accelerating the Polestar 5's development schedule. The new process is said to have resolved the challenge of how labour intensive it is to use bonded aluminium in mass production without sacrificing quality, enabling access to the benefits of light weight and rigidity that the bonded aluminium can bring. Polestar says that the body-in-white is expected to weigh less than cars in smaller segments while still delivering leading safety levels. Polestar says this will lead to a faster production introduction overall, as well as high quality and platform rigidity. Polestar's statement also notes, "The decision to develop a bespoke platform has also enabled the brand to deliver a production model that remains true to the Precept concept car that inspired it."

Outlook and implications

The Polestar 5 will be a four-door GT, based on the Precept concept. The work was carried out at a Polestar facility established in 2019, with 60 engineers then. Along with announcing the new platform, Polestar noted that it would hire 500 more engineers for the facility in the coming months. Although born from Volvo and Geely, Polestar describes itself as a "standalone Swedish premium electric vehicle manufacturer". The new platform can help the company evolve to become more independent. Polestar is also looking to be publicly traded and has confirmed that its efforts are on track to be closed in the first half of 2022. The Polestar 5 is due to be revealed in 2024, after the Polestar 3 in 2022 and the Polestar 4 in 2023. With the Polestar 5's arrival, the premium brand will be present in several segments, and IHS Markit is now part of S&P Global forecasts that global sales will reach about 130,000 units in 2025 and 199,000 units in 2030. Within the Geely brand stable, Polestar's annual sales are forecast to slow behind Geely, Volvo, Lynk&Co, and Zeekr in 2030.



2024 Polestar 5 platform

Photo courtesy of Polestar



[Technology & Mobility Highlights] Mobileye, Beep, Benteler collaborate on autonomous shuttle launch plan in 2024

Mobileye, Beep, Benteler are collaborating on plans to launch micro-transit autonomous vehicles (AVs) in the United States in 2024, according to a joint statement. The collaboration will leverage the partners' expertise to create an AV aimed at first- and last-mile transportation solutions. According to the statement, the three companies plan to "address the end-to-end requirements for developing and deploying autonomous movers with competencies encompassing scalable vehicle development, end-to-end systems integration, autonomous driving platforms and turnkey mobility operations management and technology." The vehicles will be automotive grade, fully electric and autonomous, and deployed in public and private communities in North America. The targeted is an SAE Level 4 vehicle, which means its autonomous capability will be geofenced to specific operational areas. Benteler EV Systems is to provide the scalable and modular platform, develop the autonomous mover, and integrate all individual subsystems into the final vehicle. Production is to be in the United States, although the planned location has not been disclosed. Benteler is to provide industrialisation and production of the vehicle. Marco Kollmeier, managing director of Benteler EV Systems GmbH, said, "These movers need to be robust for 24/7 public or commercial use, at optimized costs and with excellent riding comfort. Consequently, we decided to go for this strategic collaboration with our partners Mobileye and Beep, to build autonomous movers delivering exactly against these market demands." Mobileye is to provide the autonomous driving solution with its Mobileye Drive system. Beep has already tested autonomous electric shuttles in a number of US locations, and the company states that it has "worked closely with the National Highway Traffic Safety Administration as part of its autonomous vehicle test programs and is applying those years of learning to assist in the design of the new platform with an emphasis on safety". Beep's experience includes machine learning, contextual route intelligence, and a centralised command centre platform. The AV is envisioned to include seats for 12 to 14 people, and no steering wheel or pedal, which will require an exemption from US regulators. The vehicles will be operated on public roads, although with speeds limited to 35 miles per hour or less.



Outlook and implications

The three companies did not disclose details of several issues, including funding or financial details of the collaboration and planned initial areas of deployment of the AVs. The companies have not disclosed the planned production location or how many AVs they aim to deploy initially. Beep has run AV pilot programmes in the US in areas including Yellowstone National Park, Georgia, Florida, and Arizona.



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[Supplier Highlights] Carota announces new automotive OTA-related solutions

Carota offers OTA and remote diagnostic full solutions



Source: Getty image/ gorodenkoff

Carota has unveiled new services for the mobility industry and automotive OEMs, it said in a press release on 15 February. Carota offers over-the-air (OTA) and remote diagnostic full solutions. It has reportedly installed and upgraded 320 million smart devices with customers in over 20 countries and areas, including Greater China, the United States, Europe, Japan, Korea, India, and Southeast Asia.

“Our mission is to supply automakers with a one-stop full solution for OTA testing and deployment, remote diagnostic, cybersecurity, digital content management, and subscription services. Through the acquisition of EGK, a well-known domestic IoV service provider, Carota extends its IoV services and commercial application spectrum to deliver a comprehensive fleet management system and driving analytical services,” said Paul Wu, CEO and founder of Carota.

Outlook and implications

Carota spoke about its six ‘pillars of business’, which included whole car OTA, remotely delivering new functionalities, features enhancements and security patches to improve the driving experience and vehicle's safety, OTA testing service and equipment to reduce the number of software defect issues and vehicle recalls, remote diagnostic and event recording, cybersecurity, licensing and subscription services, and fleet, transportation, as well as driver one-stop management system service.

[Supplier Highlights] CATARC selects Rohde & Schwarz's C-V2X RF automated test system

C-V2X is gaining more traction from automakers and suppliers and appropriate testing methods is vital for adoption of this technology



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Source: Getty Image/ Scharfsinn86

China Automotive Technology and Research Center (CATARC) has chosen Rohde & Schwarz's radio frequency (RF) cellular vehicle-to-everything (C-V2X) automated test system to conduct its onboard unit (OBU)/roadside unit (RSU) RF performance testing, according to a press release published by CATARC 9 February.

Outlook and implications

Vehicle OEMs and Tier 1 component suppliers require a standard system to support and provide guidance toward development and research of their C-V2X products and function of the overall system. Additionally, testing service companies and authorities need to conduct large number of validation and certification work in accordance with the government and industry regulatory requirements. The Rohde & Schwarz RF C-V2X automated test system was selected by CATARC due to its comprehensive coverage of Internet of Vehicles C-V2X RF test applications and overall system standard assessment capability. Rohde & Schwarz conducted joint debugging with major C-V2X chip manufacturers and resolved many challenges of C-V2X RF testing with support from CATARC. The system is capable of complete test project coverage, a high degree of automation and flexible instrument configuration, which meets the requirements of the automotive industry for C-V2X radio frequency testing.

In China, the GB/T "Technical Requirements for Vehicle Information Interaction System Based on LTE-V2X Direct Communication" is the foundation of the Internet of Vehicles standard system, which is being formulated by the country's Auto Standards Committee. This includes the RF performance requirements and test methods of Internet of Vehicles products.

The system integrates the R&S CMW wideband radio communication tester and the R&S SMBV100B vector signal generator, which supports the C-V2X protocol, data consistency and electromagnetic compatibility test cases required. The system also enables upgrade of hardware-in-the-loop test system for the Internet of Vehicles traffic scenario.



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[VIP ASSET] Electrification of medium-and heavy-duty commercial trucks gain momentum with new policy updates, as predicated in IHS Markit now a part of S&P Global’s 2021 Reinventing the Truck study

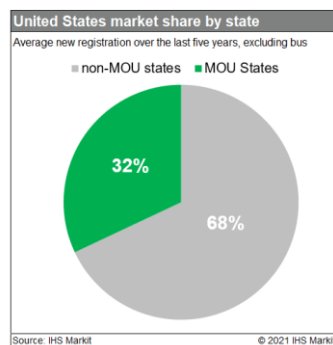


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Advanced Clean Trucks, move beyond California

California's Advanced Clean Trucks		
ZEV sales Percentage Schedule		
Model Year	Class 4-8	Class 7-8 Tractors
2024	9%	5%
2025	11%	7%
2026	13%	10%
2027	20%	15%
2028	30%	20%
2029	40%	25%
2030	50%	30%
2031	55%	35%
2032	60%	40%
2033	65%	40%
2034	70%	40%
2035	75%	40%

Source: IHS Markit © 2021 IHS Markit



On November 17th, 2021 the state of Oregon became the second state to adopt the Advanced Clean Trucks (ACT) policy requiring medium-and heavy-duty truck (MHCV) manufactures to sell an increasing percentage of zero-emission trucks in their state. Just twelve days later and a few hundred miles north, on November 29th the state of Washington became the third state to join California, thus solidifying the west coast as leaders in the US MHCV electrification market. Moving east, late in 2021 Massachusetts, New Jersey and New York also announced they have formally adopted the rule. Over the last three months, five states have officially committed to a future of zero-emission MHCV's with their adoption of California's Advanced Clean Trucks rule. These states, including California, account for about 17% of all new US MHCV registrations. To understand the significance of these developments, let's look back to see how the industry got to this point.

In June 2020, California adopted an industry first rule that required truck manufactures to sell an increasing number of zero-emission trucks in their state, called Advanced Clean Trucks. One month later in July 2020, 15 other states and the District of Columbia announced a joint memorandum of understanding (MOU) to accelerate the market for zero-emission MHCV's. The states that joined the MOU represents almost one-third of new registrations in the United States which include, California, Connecticut, Colorado, Hawaii, Maine, Maryland, Massachusetts, New Jersey, New York, North Carolina, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington. As we start a new year, the backdrop is now set for continued momentum towards electrification; the Biden Administration took office at the beginning of 2021 with a renewed focus on climate change, a wide-variety of targets and announcements have been made by industry players including truck manufactures pushing zero-



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emission technology and now individual states are taking matters into their own hands by requiring the electrification uptake to occur.

The IHS Markit now a part of S&P Global perspective: what these developments could mean moving forward

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