

# Automotive Industry Weekly Digest

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Auto VIP

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## [Forecast & Analysis Highlights] BYD, Geely and SGMW lead NEV sales in mainland China during October

### S&P Global Mobility perspective

**Implications** Retail sales volumes of passenger new energy vehicles (NEVs) in mainland China increased by 37.5% year over year to 767,000 units in October, according to data from the China Passenger Car Association (CPCA).

**Outlook** In our October forecast release, we expect the production volume of new-energy light vehicles, which include BEVs, PHEVs, and range-extended electric vehicles (REEVs), to grow by 31% year over year to 9.18 million units in mainland China.



Getty Images

Retail sales volumes of passenger new energy vehicles (NEVs) in mainland China increased by 37.5% year over year to 767,000 units in October, according to data from the China Passenger Car Association (CPCA). On a month-over-month basis, sales volumes rose by 2.7% in October, taking passenger NEV retail volumes for the year to date (YTD; January–October) to 5.954 million units, up 34.2% year over year. Underpinned by solid demand from private car buyers, the passenger NEV market in mainland China continued to expand at a faster pace than the broader passenger vehicle market in October, which grew moderately by 10.2% year over year to 2.033 million units last month. From a retail sales perspective, NEVs accounted for 37.8% of mainland China's passenger vehicle market in October, improving from 30.2% in the corresponding period of 2022. Battery electric vehicles (BEVs) accounted for 67% of mainland China's NEV sales in October, while the share of plug-in hybrid electric vehicles (PHEVs), including range-extended electric vehicles (REEVs), reached 33%.

In the sales rankings of the top NEV manufacturers, BYD had a share of 33.7% by retail volumes in October, as the largest NEV manufacturer in mainland China. Retail sales of the company were 258,011 units last month, up 25% year over year. Geely and SAIC-General Motors-Wuling (SGMW) took the second and third positions in the rankings in October, with sales of 59,974 units and 48,935 units respectively. Their market shares were 7.8% and 6.4% respectively, far lagging behind BYD. Changan Auto and GAC AION reported sales of 48,332 units, and 41,331 units respectively in October, taking the fourth and fifth positions in the rankings. Li Auto took fifth spot in the NEV sales rankings in October with volumes of 40,422 units, a new sales record for the startup company. Great Wall Motor and Tesla occupied seventh and eight positions, respectively, in the NEV sales rankings in October with sales of 28,907 units and 28,626 units. Tesla's position in the top sales rankings slid notably in October as it shipped more than 43,000 vehicles built in Shanghai, including the refreshed Model 3, to other markets. Xpeng and Leapmotor posted sales of 20,002 units and 18,202 units respectively, to take the ninth and 10th positions.



Overall, Chinese domestic brands are dominating mainland China's NEV market thanks to their competitive product offerings covering BEVs, PHEVs and REEVs. The price cuts initiated by local brands on their high-volume models also helped to make NEVs more appealing relative to same-segment ICE models.

## Outlook and implications

CPCA data suggest that the sales share of NEVs in mainland China's passenger vehicle market reached 38% in October, up 7.6 percentage points. By wholesale volumes, the proportion of NEVs in automakers' sales also improved notably from the same month of 2022 to 36% in October. Whether NEVs will achieve a higher sales share in the passenger vehicle market depends on the availability of price competitive models and a reliable EV charging infrastructure. With NEVs representing more than a third of the passenger vehicle market, the mainland Chinese market has already been in the mass adoption phase in its transition to electrification.

In the price segment of between 100,000 yuan (US\$13,800) and 180,000 yuan, consumers are faced with a wide choice of NEV models, although BYD still dominated this price segment with its Yuan Plus, Qin Plus, Dolphin and Song Plus. AION is also a high-volume player in the segment thanks to the Y Plus and S. Changan Auto has seen rising sales of its NEVs during 2023 owing to steadying sales performances of the Deepal SL03 and S7. In the upper end of the market, the Tesla Model Y, BYD Han, Li L7, L8, AITO M7, and Denza D9 are gaining traction with consumers shifting away from ICE models introduced by German and Japanese automakers. Chinese automakers are also introducing BEVs in the multipurpose vehicle (MPV) segment, encouraged by the success of the Denza D9. On Nov. 12, Volvo Cars launched its first battery-electric MPV, the EM90, developed primarily for the Chinese market. The Xpeng X9 and Li Mega, both premium large MPVs, are also due to hit the market later this year.

In our October forecast release, we expect the production volume of new-energy light vehicles in mainland China, which include BEVs, PHEVs and REEVs, to grow by 31% year over year to 9.18 million units in 2023. With solid domestic demand and strong exports, the production volume of new-energy light vehicles in mainland is forecast to rise by 28.5% year over year in 2024 to 11.8 million units.



## [Forecast & Analysis Highlights] Argentina's light-vehicle sales surge nearly 32% YOY in October

### S&P Global Mobility perspective

**Implications** Argentine light-vehicle sales surged 31.7% year over year to 40,012 units in October, after falling 2.1% year over year in September. In the year to date (YTD; January-October), Argentina's light-vehicle sales have improved 12.9% year over year.

**Outlook** Argentina's light-vehicle sales continue to face headwinds such as global supply chain issues and currency exchange issues. Additionally, the country's economic crisis is affecting the automotive industry. Manufacturers are impacted by high inflation rates and a marked shortage of foreign currency. The October 2023 S&P Global Mobility forecast sees Argentine light-vehicle sales increasing by 5.3% in 2023 and essentially flat (up 0.04%) in 2024.



Getty Images

Argentine light-vehicle sales surged 31.7% year over year to 40,012 units in October, after falling 2.1% year over year in September, according to data from the Association of Automotive Dealers of the Argentine Republic (Asociación de Concesionarios de Automotores de la República Argentina: ACARA). Light-vehicle sales in Argentina continued increasing in the second half of 2022 and improved in most of the first 10 months of 2023. However, sales remain below the levels prior to the coronavirus disease 2019 (COVID-19) pandemic.

Argentina's light-vehicle sales have grown 12.9% year over year to 374,066 units in the year to date (YTD; January–October). In October, sales of both passenger cars and light trucks improved, while in several prior months this year, passenger car sales declined. In October, light commercial vehicle (LCV) sales grew 51.6% year over year and passenger car sales improved 21.6% year over year. The market continues to be dominated by passenger cars. In October 2023, passenger cars accounted for 61.1% of total light-vehicle sales in, versus 66.2% in October 2022. In the YTD, passenger car sales grew 7.7% year over year and LCV sales increased 22.7% year over year, with passenger cars accounting for 62.2% and LCV sales accounting for 37.8% of total light-vehicles. In full-year 2022, passenger car sales had a light-vehicle market share of 64.8%, higher than in 2021, when the market share stood at 62.8%. Generally, growth in sales of sport utility vehicles (SUVs) has been accelerating.

**Argentina' s light-vehicle sales, October and YTD**

	<b>Oct-23</b>	<b>Oct-22</b>	<b>Growth %</b>	<b>YTD 2023</b>	<b>YTD 2022</b>	<b>Growth %</b>
CAR	24,448	20,110	21.6	232,559	216,028	7.7
LCV	15,564	10,267	51.6	141,507	115,298	22.7
<b>Total sales</b>	<b>40,012</b>	<b>30,377</b>	<b>31.7</b>	<b>374,066</b>	<b>331,326</b>	<b>12.9</b>

Source: S&P Global Mobility, ACARA

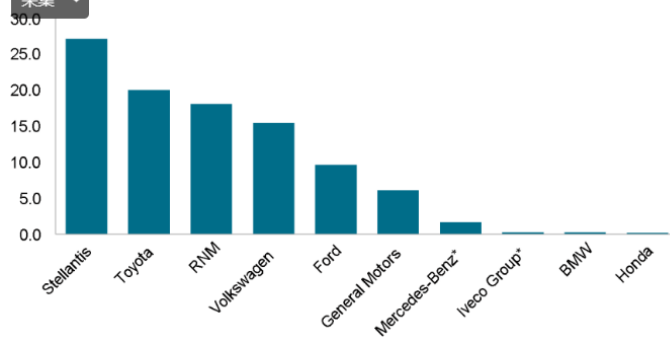
By segment, the Argentine light-vehicle market has shown some signs of change, along with changes to the market share of SUVs. The B-car segment remains the largest segment, with a 16.8% year-over-year improvement in sales in October and a 37.7% light-vehicle market share. In October, the Fiat Cronos retained first place overall and it is the B-car segment leader on sales. In October, models following the Fiat Cronos in the B-car sales rankings were the Peugeot 208, Toyota Etios and Renault Sandero. In October, sales of the Fiat Cronos increased by 39.0% month over month to 3,965 units. Despite a 55.7% year-over-year improvement in sales to 2,982 units, the Peugeot 208 remained in second place in the B-car segment. This also gives Stellantis the top two spots and 46% of sales in the B-car segment.

The C-pickup (C-PUP) segment continued as the segment with the second-highest sales in Argentina's light-vehicle market in October, at 10,718 units, up 71.5% year over year. The C-PUP segment's light-vehicle market share was 26.8% in October. Although typically the Toyota Hilux leads sales in the C-PUP segment, it has been edged out in some recent months by the Volkswagen (VW) Amarok and Ford Ranger. In October, the Toyota Hilux spent another month in second place, behind the Amarok but ahead of the Ranger in the sales rankings. The Nissan Frontier and Ford Maverick took fourth and fifth places respectively. In October, sales in the B-SUV segment were more than sales in the C-SUV segment, with a 60.7% year-over-year improvement to 3,970 units. C-SUV segment sales improved 27.4% year over year to 3,447 units. The Chevrolet Tracker is easily in the lead in B-SUV segment, with sales of 1,319 units in October versus the second-placed Jeep Renegade's 785 units, after the Jeep was the leading vehicle in 2022. In the C-SUV segment, the VW Taos led the sales rankings in October, while the Toyota Corolla Cross is leading the rankings in the year to date. These two models are followed in the rankings by the Ford Territory.

Including all vehicle segments, the Peugeot 208 and Fiat Cronos remained the top two models in terms of sales in October 2023, as they were in 2022. As discussed above, the country's light-vehicle market remains biased towards passenger cars. SUV sales had been making inroads, but pricing impacts slowed their progress and SUVs' market share has steadied. In most months of 2023, including October, and in the year to date, the B-SUV segment has grown to be the largest of the SUV segments, followed by the C-SUV segment. In October 2023, SUV sales improved 51% year over year, with their market share reaching 20.5% versus 17.9% in October 2022. In the year to date, SUV sales have improved overall by 5.6% and their market share has decreased from 19.6% in January–October 2022 to 18.3% in the YTD this year.



Top Ten OEM share, October 2023



Data compiled Nov. 13, 2023.  
Source: S&P Global Mobility.  
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In terms of sales parent companies, Stellantis easily led the Argentine light-vehicle market overall in 2022, although it was not in the lead in every month last year. In 2023, Stellantis has been in the lead more regularly. In October, Stellantis ranked first, with sales of 10,874 units, up 43.5% year over year. Toyota was in second place in October with sales of 8,045 units, up by 9.2% year over year, and in the year to date. Though Renault-Nissan-Mitsubishi Alliance has ascended to second place in some months of this year, in October and the year to date, the alliance is in third place despite a 27.2% year-over-year improvement in sales.

## Outlook and implications

Argentina's light-vehicle sales continue to face headwinds such as global supply chain issues and currency exchange issues. Additionally, the country's economic crisis is affecting the automotive industry. Manufacturers are impacted by high inflation rates and a marked shortage of foreign currency. Though Argentina's sales in October and the year to date are showing strength compared with the corresponding periods of 2022, the light-vehicle market is not in a strong position. Argentina's light-vehicle market is forecast to not see the full-year sales level in 2019 again until 2027. The October 2023 S&P Global Mobility forecast sees Argentine light-vehicle sales increasing by 5.3% in 2023 and as essentially flat (up 0.04%) in 2024.

In October 2023, Argentina's light-vehicle sales were notably higher than in October 2019 (prior to the COVID-19 pandemic), though at that time, sales were down 33.7% year over year. Argentine light-vehicle sales were nearly 441,000 units in 2019, almost half the number of light-vehicle sales in 2018. Although we forecast the market's sales to exceed the 2019 level in 2027, we do not expect them to return to the 2018 volumes through this decade. The economic crisis in Argentina is affecting negatively operations in the country's automotive industry. The Argentine automotive industry continues to see a difficult period as a result of the country's economic crisis. High inflation rates and a significant shortage of foreign currency are affecting local manufacturers. Argentina's economy, which was once a source of optimism in South America, has been struggling with unrelenting inflation, which has reduced consumer purchasing power. S&P Global Market Intelligence has adjusted its forecast for GDP in 2024 downward to a 3.5% decline, as a result of the steep drop in private-sector consumption. The forecast for the annual inflation rate in 2024 is 160%, in part on increased domestic prices of imported goods. Market Intelligence forecasts Argentina's GDP to fall 2.0% in 2023, on the extreme inflation rate. Argentina's economic activity in the remainder of 2023 is constrained by domestic challenges — it has a wide fiscal deficit and external deficit, as well as high inflation, an unstable currency susceptible to international contagion, and growing debt. Market Intelligence expects the consumer price index to jump 131% in 2023 and 161% in 2024.



This has resulted in huge increases in prices of basic products and services, such as food, gasoline (petrol), and medications.

In July, the government extended the PAIS tax (impuesto para una Argentina Inclusiva y Solidaria, or tax for an inclusive and supportive Argentina) to the automotive sector. This tax (at a rate of 7.5%) is on imports of vehicles as well as parts and components. The tax is currently aggravating local manufacturers' difficulties. There is usually an exemption for parts and components imported for the purpose of manufacturing vehicles for export. However, in practice, manufacturers must pay the tax and then receive a refund when the export occurs, which is inconvenient. Overall, navigating these regulatory requirements adds complexity and hinders activity. As a result, manufacturers are reporting payment delays to providers because of these administrative procedures. Renault-Nissan had to halt production of the Frontier and Alaskan pickups at its plant in Córdoba due to a lack of glass components, particularly windows and windshields. S&P Global Mobility projects Argentina's light-vehicle sales to be just less than 400,000 units in 2023, compared with 379,590 units in 2022. We expect the market will remain weak compared with the pre-pandemic situation.





## [OEM Highlights] AutoMobility LA 2023: Toyota reveals US-market Crown Signia, Camry at pre-show event

### S&P Global Mobility perspective

**Implications** Toyota has reworked heavily the ninth-generation Camry sedan, a core product of the brand, for the 2025 model year, while the brand is adding an SUV under the Crown nameplate, called Signia. Introduced at an off-site event ahead of AutoMobility LA, the two models are due on display at the show as well.

**Outlook** A new-generation Camry represents a core product for the brand, despite sedans slipping out of mainstream popularity for years. In 2023 through October, the Camry remains Toyota's second-best-selling model in the US, behind the RAV4. There remains some demand for sedans and few automakers left in the segment to meet it. However, a focus on the Crown brand sees Toyota pushing that sedan as, essentially, the larger and somewhat better-appointed sedan, diminishing the Camry's role somewhat. With still-slipping sedan demand in the US, this split has the potential to damage Camry sales more than help Crown sedan sales. According to S&P Global Mobility's October 2023 light-vehicle sales forecast, sales of vehicles in the US on the TGNA-K platform are expected to be about 1.23 million units in 2023 and 2024. The variety of vehicles using some version of this underpinning runs from the Toyota RAV4 to the Lexus TX.



Toyota

Toyota has unveiled the ninth-generation Camry sedan for the 2025 model year and a new sport utility vehicle (SUV) under the Crown nameplate, called Signia. Toyota introduced both models for the US market at an off-site event ahead of the AutoMobility LA show in Los Angeles, California (United States), on Nov. 16, 2023, and the two vehicles are due on display at the show as well.

The Toyota Camry sedan remains a key product for the brand, even amid a shift to utility vehicles, and the latest iteration arrives for the 2025 model year. In addition, Toyota is expanding the Crown brand to include a crossover SUV for the US market as well as Japan. In the US, this new SUV will be known as the Crown Signia.

### Crown Signia

The Crown Signia SUV is derived from the Crown sedan and it is being introduced for the 2025 model year. In Japan, the company is creating a Crown range of four model versions. The US is expected to see only the Crown sedan and the new Crown Signia SUV. The Crown Signia is due to be launched in mid-2024 with a version of the 2.5-liter 4-cylinder, two-motor hybrid powertrain of the Crown sedan, though tuned for 243 horsepower (hp) versus the Crown sedan's standard 236 hp. The Crown Signia is to be offered in all-wheel-drive form only, and at



launch, it will not be offered with the turbocharged 2.4-liter, 4-cylinder, 340-hp hybrid powertrain available in the Crown sedan. The Crown Signia will be offered in two trim levels for the 2025 model year, the XLE and the Limited, keeping down complexity for the new model. The Crown sedan is offered in XLE, Limited and Platinum grades. The Crown Signia, as with other Toyota hybrids, will have Normal, Eco and Sport driving modes. Toyota says it is also giving it an electric vehicle (EV) mode “for electric-only driving at low speeds for short distances.” In terms of positioning, the vehicle will replace the Venza in Toyota’s US lineup. While Toyota says it has been happy with the market performance of the Venza, these two models are too close within the lineup, and the Crown Signia supports the company’s effort to revive the Crown name in the US. The Crown nameplate has been around for 55 years in Japan and is a source of pride for the company there.



2025 Toyota Crown Signia.  
Stephanie Brinley



2025 Toyota Crown Signia.  
Stephanie Brinley

The Crown Signia’s powertrain will see a combined fuel economy rating of 36 miles per gallon, according to Toyota’s estimates. The all-wheel-drive (AWD) system is Toyota’s electronic on-demand system, which means the rear-wheel drive is through a dedicated rear electric motor that moves the rear wheels when needed. It shifts up to 80% of torque to the rear wheels on acceleration. While driving, the system varies from 100% front-wheel drive to a 20/80 front/rear-wheel split when needed. This AWD system, though similar to the one used in the RAV4, which has some off-road capability, is aimed in the Crown Signia for winter conditions more than rough terrain. The Crown Signia’s towing capacity is not particularly impressive at a modest 2,700 pounds. Toyota says it wants to focus on the vehicle’s “performance vibe,” which it says is communicated through the vehicle’s wide stance, optional 21-inch wheels, and the Toyota Hammerhead front. The two-row vehicle sees the second row of seating fold flat for a 6.5-foot long cargo area, when needed, and offers a roomy second row when passengers are a priority. With the Crown Signia — a name derived from the word insignia, Toyota says — the company has focused on “sedan-like comfort and SUV versatility.” The rear seats are meant to be lounge-like, emphasizing that rear-seat comfort target; an optional fixed glass panoramic roof with retractable shade opens up the interior. The Crown and Crown Signia are on the TNGA-K platform. With the Signia, noise reduction materials include acoustic glass on the front side windows, a dash silencer, and engine cover of acoustic absorbing materials. The Crown Signia inherits the Crown’s standard and optional technology, and safety and advanced driver-assistance features. These include Toyota’s latest infotainment system, a 12.3-inch center display, Toyota Safety Sense 3.0,



traffic jam assist, front cross-traffic alert, and lane change assist. The Crown Signia shares much from the front-row interior of the Crown sedan, though with an SUV rear cargo area.



2025 Toyota Crown Signia.  
Toyota



2025 Toyota Crown Signia.  
Toyota

## Camry

The ninth-generation Toyota Camry sedan also arrives for the 2025 model year. The new Camry is due on sale in the US in about the second quarter of 2024, likely a couple of months ahead of the Crown Signia. While the Crown Signia is produced in Japan, Toyota continues with US manufacturing of the Camry. Though Toyota says this is a new generation, it represents a heavy reworking of the existing car and platform. The new exterior is modern and fresh. While Toyota's unveiling has placed less emphasis on it being part of a design revolution compared with the eighth-generation model, an initial look at the new-generation Camry shows an attractive, modern sedan. The latest Camry has cleaner looks inside and out, aligned with current trends. It comes with a new powertrain, a revised interior (including more comfortable seats), improved technology and a longer list of safety equipment. In terms of safety and advanced driver-assistance features, the Camry, as with the Crown and Crown Signia, has Toyota Safety Sense 3.0 and optional traffic jam assist, front cross-traffic alert, lane change assist, panoramic view monitor and front and rear parking assist with automatic braking. In terms of new technology, the Camry gets the latest Toyota infotainment system, with available voice assistant, and makes a Digital Key available for upper trim levels. The Camry's base center stack screen is an 8-inch unit, with the 12.3-inch screen optional. Both systems include wireless smartphone projection and a wireless charging pad is as standard.



2025 Toyota Camry.



Stephanie Brinley



2025 Toyota Camry.  
Toyota

The new-generation Camry moves to a hybrid-only powertrain, dropping both the 203-hp 2.5-liter 4-cylinder unit and the 301-hp 3.5-liter V6 gasoline-only unit options. Instead, the Camry has only the fifth-generation Toyota Hybrid System (THS 5) with a 225-hp, 2.5-liter 4-cylinder engine. The new-generation Camry also has the additional option of Toyota's electronic AWD system (front-wheel drive continues as standard); in the AWD, the extra motor at the rear increases the horsepower to 232. Though the new Camry AWD brings 30 more horsepower than the outgoing AWD version, 232 hp is the upper end of the Camry's power for the 2025 model year. While the Crown Signia will be offered in only one trim level and the Crown sedan also does not have lower trim levels, the Camry serves a wider range of buyers and price points. It will be offered in LE, SE, XLE and XSE trim levels. Toyota positions the LE and XLE as "comfort" grades and the SE and XSE as "sport" grades. At least initially, the new-generation Camry will not have a Limited trim. The objective of this may be to reinforce the Crown sedan as the upper-level entry within the Toyota brand; the Crown starts at the XLE trim level and has Limited and Platinum levels.

Toyota is positioning the new-generation Camry SE and XSE as having sporty exterior styling cues, including functional aerodynamic air ducts, front-side canards, rear diffuser, exposed dual-tip exhaust and a rear lip spoiler. The XSE has a color-matched front grille and black trunk garnish. The SE has as standard 18-inch wheels, while the XSE moves to 19-inch wheels.

## Outlook and implications

A new-generation Camry represents a core product for the brand, despite sedans slipping out of mainstream popularity for years. In 2023 through October, the Camry remains Toyota's second-best-selling model in the US, behind the RAV4. There remains some demand for sedans and few automakers left in the segment to meet it. However, a focus on the Crown brand sees Toyota pushing that sedan as, essentially, the larger and somewhat better-appointed sedan, diminishing the Camry's role somewhat. With still-slipping sedan demand in the US, this split has the potential to damage Camry sales more than help Crown sedan sales. According to S&P Global Mobility's October 2023 light-vehicle sales forecast, sales of vehicles in the US on the TGNA-K platform are expected to be about 1.23 million units in 2023 and 2024. The variety of vehicles using some version of this underpinning runs from the Toyota RAV4 to the Lexus TX.

Sharing the platform across at least a dozen vehicles, including sharing variations of the gasoline and hybrid powertrain options, improves scale in several key areas. However, there are still a dozen Toyota and Lexus models to support. The Camry has a clear position in the Toyota showroom, and the Crown Signia will replace the short-lived Venza. The Venza initially was positioned as a vehicle for 'empty-nester' Toyota buyers looking for a two-row vehicle that was more well appointed than the RAV4. Toyota executive David Christ says the Crown



Signia will be positioned slightly above where the Venza was in the lineup, as the Crown nameplate has a premium feel in general. With utilities more popular in the US than sedans, it would seem the Crown Signia is better suited to this market (and could maybe see more sales) than the Crown sedan; the Crown Signia also appears to be a better size for the US market than the Venza. Crown products have the potential to split demand for Toyota vehicles instead of adding to it. This is a story that has played out, so far, for the Grand Highlander and Highlander three-row utilities. Broadly, since the Grand Highlander was launched, Highlander sales have fallen by a similar amount as sales of the Grand Highlander. The Grand Highlander should be more profitable, which is better for Toyota's bottom line, but the Grand Highlander is not helping with a growing concern over general vehicle affordability in the US and, from its early months on sale, it is not clear that it is bringing new buyers to Toyota.

While carrying on with the Camry in the US is basically a given for Toyota, splitting its trim levels up toward the Crown might suggest the notion that adding new models increases overall sales might be tested for Toyota in this case. The formal reason for having fewer Camry trim levels for the new model year than in prior years is an effort to simplify the lineup, but a side effect may be to push people who want more amenities to the Crown. It is not clear that Toyota ultimately will be better served by this bifurcation. Both the Crown Signia and the Camry seem suitable for a higher horsepower option, and one exists within the Toyota range in the V6 hybrid of the Crown sedan. Officially, Toyota has no comment on this potential horsepower upgrade. Transitioning the Camry to full hybrid does carry some risk; according to S&P Global Mobility registration data, from January through September 2023, about 83% of Camry registrations were vehicles with the standard 2.5-liter 4-cylinder engine and only 10% were vehicles with the current hybrid. The new hybrid promises stronger performance, but the Camry is a bread-and-butter vehicle that needs to appeal to nearly 300,000 buyers a year. Toyota may be successful in this transition, but it does carry some risk.

## **[OEM Highlights] Huawei announces pre-sale pricing of Luxeed S7 sedan in China**

Huawei began pre-sales of the Luxeed S7 on Nov. 9. The model has been introduced jointly by Huawei and Chinese automaker Chery. Under the partnership, the two companies are expected to bring a range of electric vehicles to the market, which will feature Huawei's latest automotive solutions. The Luxeed S7 is a battery electric sedan with an overall body length of 4,971 millimeters. The model has Huawei's HarmonyOS 4.0 operating system and its new-generation DriveOne powertrain. Four trim versions are available for reservation in the pre-sales phase. The S7 Pro model delivers a range of 550 kilometers (km), and the Max and Max+ are expected to feature Huawei's ADS 2.0 automated driving system and have a longer range of 705 km to 800 km. The S7 Max RS, the highest-specification model, will be powered by a dual-motor four-wheel-drive system. Air suspension will be offered as standard equipment in the Max RS. The S7 has Huawei's 800-volt platform. The company claims that it only takes five minutes to add 200 km of range under fast-charging mode. The Luxeed S7



will officially go on sale in China on Nov. 28. The pre-sale pricing ranges from 258,000 yuan (US\$35,450) to 358,000 yuan.



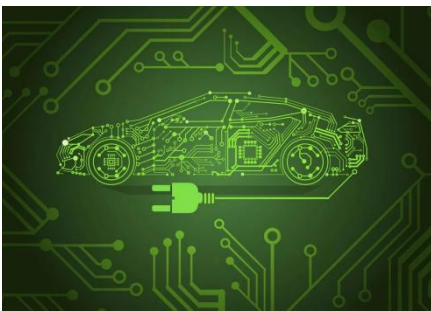
## Outlook and implications

Huawei has already entered into partnerships with several Chinese carmakers to incorporate its technologies in their latest models. The Avatr 11, for instance, has adopted Huawei's HarmonyOS operating system and its automated driving system. Huawei is also involved in the development of models of the AITO brand. AITO's models, including the M5 and M7 sport utility vehicles, are sold via Huawei's showrooms both online and off-line. Huawei has apparently adopted the same approach in its partnership with Chery. The tech company expects to familiarize car buyers with its automotive technologies through partnerships with auto OEMs and products like the Luxeed S7. The S7 and upcoming new vehicles from the Luxeed brand will be manufactured by Chery, although apparently Huawei is the brand that really draws consumers to the market.



## [Technology & Mobility Highlights] Mahindra & Mahindra partners with Valeo for electric powertrain

Mahindra & Mahindra (M&M) has selected Valeo, a global leader in mobility electrification technologies, to supply electric powertrains for its Born Electric passenger vehicle platform, according to a company press release. The deal, worth nearly US\$1 billion, will also see Valeo supplying the on-board charger for M&M's electric utility vehicles. In a bid to support M&M's electrification goals, Valeo will localize the production of the electric powertrain in Pune, in the Indian state of Maharashtra, close to M&M's plant. The locally produced components will include the electric motor, inverter, gearbox and the integrated 3-in-1 bi-directional combo power electronics, combining the on-board charger (OBC), DC-DC converter and power distribution unit (PDU). Leaders from both companies have expressed optimism about the partnership. Xavier Dupont, president of Valeo's powertrain systems sector, highlighted that the collaboration would enable M&M to offer Indian customers EVs with higher voltage and increased autonomy. On the other hand, Vinod Sahay, president and chief purchase officer — Auto and Farm Sectors — M&M, outlined the automaker's vision to lead the electric mobility revolution, with Valeo's localized solutions playing a crucial role.



### Outlook and implications

The partnership between M&M and Valeo marks a significant step in India's electric mobility journey. By localizing the production of key components and leveraging Valeo's advanced electrification technologies, M&M is poised to make a substantial impact on India's EV landscape. M&M is one of the key automakers in India and has been actively pursuing developments in electric mobility. The automaker plans to launch five new electric sport utility vehicles (SUVs) for both the domestic and international markets. These vehicles will be launched under two sub-brands: the iconic brand XUV with the "Twin Peak" logo in copper and the all-new electric-only BE brand. M&M has said its plans to launch a new range of electric SUVs are on track. It plans to begin production of the XUV.e8 in December 2024, the XUV.e9 in April 2025, the BE.05 and BE Rall-E in October 2025 and the BE.07 in October 2026. S&P Global Mobility expects M&M's electric light-vehicle production to stand at about 10,000 units in 2023 and to grow to about 104,000 units in 2027 and to approximately 141,000 units in 2030.



## [Forecast & Analysis Highlights] Posco to invest US\$519M to ramp up EV parts business

Posco International Corp., the energy and trading unit of South Korean steel giant Posco Holdings Inc., plans to invest 680 billion won (US\$515.8 million) to ramp up its electric vehicle (EV) component business, with the aim of taking advantage of the surging growth of electric mobility, reports The Korea Economic Daily. Posco plans to make this investment over 2024–35, to more than double its global output of traction motor cores (stator and rotor) to 10 million units from the planned 4.3 million units in 2025. The company aims to allocate 44% of the funds to North America and 20% to Europe, while the rest will remain in South Korea.



### Outlook and implications

The plan to expand into the EV parts business is part of Posco's global strategy to launch a foray into sustainability-associated businesses. Citing the company, the report says that the global traction motor market is predicted to expand faster than the EV market, with demand expected to reach 140 million units in 2035, far more than expected demand for EVs of 90 million units, as more powerful, larger EVs need multiple motors. The report cites examples of EVs that feature more than one electric motor, including General Motors' 830-hp Hummer EV, which comes with three motors, and the 835-hp Rivian R1S sport utility vehicle (SUV), which comes with four motors. The global transition to electric mobility continues to shift the focus of large, tier 1 automotive parts suppliers away from internal combustion engines (ICEs) and transmissions to EV batteries and electric motors. Posco stated that, from an initial 20,000 motor cores, its newest factory in Poland, which is scheduled to be built in early 2024, will produce roughly 2 million units by 2035. The company plans to increase motor output from the expected 1.4 million units in 2025 to 4 million units by 2035 at a recently opened plant in Mexico. Similar goals are being pursued at motor core facilities currently in operation in China, India and South Korea. By 2030, Posco aims to almost double its output in China to 1 million units. It plans to boost output in India from 70,000 motor cores in 2025 to 500,000 by 2035. In South Korea, the number is set to grow from 2.3 million units to 2.7 million units over the decade.





## [Supplier Highlights] Siemens partners with Arm and AWS to bring Pave360 to cloud for automotive application

**The breakthrough Pave360 digital twin solution will help accelerate next-generation SDV innovation with virtual car in the cloud**



Source: Getty/Peera\_Sathawirawong

In a press release on Nov. 14, Siemens Digital Industries Software has announced that its Pave360-based solution for automotive digital twin is now available on Amazon Web Service (AWS). Expanding on the strong partnership between Siemens and AWS, Pave360 helps to foster innovation in the automotive industry through hardware and software parallel development, "shifting-left" the design phase of the software-defined vehicle (SDV). With a parallel approach, developers can compress the design cycle time and accelerate time to market. In addition, Siemens has collaborated with Arm to help enable developers to access Arm-based technology running on Siemens' Pave360 digital twin solution via AWS cloud services.

Automakers are now able to develop software and evaluate key Arm-based system and software components earlier in their intellectual property (IP) selection and design cycles, without the burden of conventional on-premises software, simply by accessing the Pave360 solution available on AWS. This not only helps address the technology and commercial challenges ahead but also helps empower developers to gain a competitive advantage by shifting-left hardware and software development, with unprecedented simulation speeds, enabling them to meet shrinking time-to-market requirements. By using AWS technology, developers can experience near real-time simulation speeds that are significantly faster than conventional on-premises modeling and simulation infrastructures.

"The automotive industry is facing disruption from multiple directions, but the greatest potential for growth and new revenue streams is the adoption of the Software Defined Vehicle (SDV)," said Mike Ellow, executive vice president, EDA Global Sales, Services and Customer Support of Siemens Digital Industries Software. "The hyper-competitive SDV industry is under immense pressure to quickly react to consumer expectations for new features all while being pushed to move towards shorter software development cycles. This is driving the adoption of the 'shift-left' methodology for parallel hardware and software co-development and the move toward the holistic digital twin. Delivering PAVE360 on Arm-based AWS cloud services helps enable organizational efficiencies that are simply not available through today's traditional development methods."



## [Supplier Highlights] Ineos Styrolution, Sinopec open new acrylonitrile butadiene styrene facility in China

**The construction of the facility began in 2020 and spanned 26.7 hectares, with over 360 employees and contractors involved**



Source: Getty Images

Ineos Styrolution and Sinopec have officially opened a new world-scale acrylonitrile butadiene styrene (ABS) facility in Ningbo, China, with an annual production capacity of 600,000 metric tons. The facility uses Ineos Styrolution's advanced Terluran ABS technology and is strategically located to better serve customers in the Chinese market. The official opening ceremony was attended by government officials and executives from both companies, according to a company press release on Nov. 21.

Ineos Styrolution CEO Steve Harrington emphasized the company's commitment to growing in China, the world's largest ABS market. Ineos Styrolution President Asia-Pacific Rob Buntinx highlighted the facility's proximity to customers, which will enable faster and more efficient response to local demands.

The construction of the facility began in 2020 and spanned 26.7 hectares, with over 360 employees and contractors involved. The facility will produce high-end ABS materials that will enhance the design and functionality of various applications across multiple industries, including automotive, electronics, household, healthcare, toys, sports and leisure.

Ineos Styrolution Sinopec Advanced Materials CEO Meizhu Fang praised the team's "can-do" attitude and the government authorities' unwavering support for the project's successful completion despite the challenges posed by the global pandemic.



# [VIP ASSET] Gigacasting: The hottest trend in car manufacturing

## [1]

### A costly gamble?

The cost-benefit analysis of gigacasting should be based on achieving a good-enough first-pass yield rate and maintaining a sufficient, yet not excessive, number of orders for the same part. When comparing gigacasting to conventional steel stamping or aluminum-stitching, S&P Global Mobility nonetheless assesses the unit price for a single-piece, gigacasted aluminum rear floor to be valid.

To streamline the production chain and enhance production efficiency, tier 1 gigacasting suppliers have the potential to consolidate orders from original equipment manufacturers (OEMs), thereby avoiding redundant investments in gigacasting machinery. However, the downtime to switch tooling on a gigacasting machine, which often weighs several tons, can range from hours to days — inevitably reducing the utilization rate and productivity.

Based on our previous analysis of a typical 6,000T press force megacasting machine for rear floor module fabrication, its maximum annual capacity is estimated at 100,000 to 150,000 pieces, with cycle time of 120 to 150 seconds per piece, operating 16-20 hours a day for up to 300 working days a year, assuming a 90% yield rate. Frequent tooling changes for different parts on the same gigacasting machine would further reduce these output figures.

For a specific example, Tesla's Gigafactory in Shanghai Lingang is equipped with three or four sets of IDRA's gigapress units, specifically dedicated to casting the one-piece rear floor for the Model Y. The maximum production capacity for this model is estimated to reach up to 600,000 units per year, considering the scale of the gigapress units.



Image source: Tesla

A schematic of a Tesla Model 3 (left) and Model Y body-in-white, comparing traditional vs. gigacast assembly. The Model 3 comprises 171 metal pieces, whereas the new gigacast Model Y rear structure requires just two pieces of metal and 1,600 fewer welds.

However, Tesla opted not to utilize gigapress technology for the all-new Model 3s produced in China, which was unveiled in August. Contrary to previous reports, this model did not feature a one-piece aluminum rear floor, nor did it incorporate a larger single-piece gigacasted underbody.

As such, we assert that only a substantial number of gigacasting machines can effectively sustain the outsourced gigacasting supply chain. Why is that? Considering the maximum output volume is restricted to 150,000 pieces per year, it is evident that the existing capacity cannot support an additional program for Model 3 volumes. The mega-casting stands are fully occupied, and there are no available land resources or plans for further investment to expand the in-house capacity at Tesla's Lingang plant, at least as of now.



## Roadblocks to gigacasting

How can OEMs and suppliers integrate gigacasting technology with traditional body shop processes? As Elon Musk has noted, it's more complicated to make the 'machine that makes the machine' than the end product itself.

The production of a gigacasting machine entails an investment of several months, dedicated to both manufacturing and meticulous fine tuning, until the machine achieves a level of reliability and stability suitable for consistent output. These processes are undeniably labor-intensive and demand a substantial infusion of specialized knowledge. Currently, there exists a handful of companies, (including LK Group, Buhler, Yizumi, Haitan and UBE), capable of manufacturing the gigacasting machine. Consequently, the newfound capacity for gigacasting falls short of meeting the escalating demand for electrified vehicles.

There also are issues with production management on the plant floors. Megacasted single piece machines present an opportunity for OEMs to significantly reduce the presence of machines, robots, and manual labor in their traditional car body plants. However, the implementation of two distinct manufacturing systems — the traditional body shop employing stamping and welding processes, and the gigacast model featuring fewer machining processes but necessitating new conveyor systems to handle substantial material volumes — represents a pragmatic compromise at the current juncture.

Which then begs the question of how to profitably renovate or rebuild existing production lines to incorporate outsourced gigacasting components. Such methods remain unproven and, as of now, unjustified. While capable of fabricating a portion of the underbody structural components, gigacasting does not preclude the necessity for all stamping and welding processes in the body shop.



The application of press force in megacasting machines has given rise to considerable debate. Normal high-pressure die-casting of aluminum typically involves press forces of less than 4,000 metric tons.

However, Tesla raised the ante with its groundbreaking innovation in 2019 to use gigacasting to fabricate the rear floor section of the Model Y — using between 6,000 and 9,000 metric tons of force. Tesla also is reportedly close to being able to die cast nearly all of the underbody of an electric vehicle in one piece.

Chinese OEMs are now diligently striving to replicate Tesla's success with gigacasting machines featuring increasingly higher press forces; there are reports of even more formidable 12,000 and 16,000 metric ton machines.



While megacasting the body section may not yield immediate profitability, there is a collective determination within the industry to remain committed until the revolutionary future arrives. While the use of megacasting to produce body parts may require a long-term path to profitable operation, the industry is committed to developing this technology because it has the potential to rethink traditional supply chains and production.

Nevertheless, S&P Global Mobility sees numerous obstacles ahead, including challenges related to the quantity of gigacasting machines, new issues arising in plant floor management, the need to explore alternative technical solutions and more.

Suppliers and OEMs should consider these impediments when evaluating the strategic horizon aligned with these casting questions.

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market. Just a handful of mainstream models, like the Chevrolet Bolt, Nissan Leaf, and Tesla Model 3, were available at that time.

But 2021 brought a dramatic burst of consumer EV acceptance. Buyer willingness soared, with 86% of global respondents being open to acquire an EV. Multiple factors stirred up these good feelings: New mainstream models from Ford, Hyundai, Kia, and Volkswagen (VW) hit the market. The pro-EV push in the US by the Biden administration, and legislation in multiple US states and in Europe banning future internal combustion engine (ICE) vehicles, further heightened visibility.

While 67% of the 7,449 participants surveyed in May 2023 were open to the idea of purchasing an EV — certainly higher than in 2019 — it is a 19 percentage point decline from 2021. What happened? The last two years have brought more consumer choice. These span the far ends of the market, from huge electric pickups in the US to many small EV choices becoming available in Europe and China.

For one, price fatigue has set in, driven by rising interest rates and inventory shortages that have only recently seen relief, said Brian Rhodes, director of connected car and vehicle experience for S&P Global Mobility.

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