



Automotive Industry Weekly Digest

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[OEM Highlights] Lexus NX gets PHEV variant, new infotainment system

IHS Markit perspective

Implications	Lexus has revealed an all-new NX, which also brings Lexus' most thorough and significant overhaul of the user experience to date. The NX is a step forward from the first generation in design and safety, but the new Lexus Interface brings Lexus into the conversation when it comes to user experience.
Outlook	The NX is the compact utility in the Lexus line-up, sitting above the UX and below the key RX utility vehicle. This generation will help Lexus to transition to a more highly electrified and connected future, while meeting the needs of current ICE buyers. All-new for the 2022 model year, the NX is set to meet expectations of today's luxury compact CUV buyers.

Lexus has revealed an all-new NX, which brings Lexus' most thorough and significant overhaul of the user experience to date. The NX is a step forward from the first generation in design and safety, but the new Lexus Interface, which will roll out to future Lexus models, brings Lexus into the conversation when it comes to user experience. It was revealed via a livestream event on 11 June and joins the US line-up as a 2022 model year product later in 2021. IHS Markit looked at the US specification vehicle and its new features ahead of the reveal. Lexus confirmed that production of the new model will begin in the third quarter of 2021 with sales in most markets in the fourth quarter. Production of this generation will also be added to the Toyota plant in Cambridge (Ontario, Canada).

Lexus NX: New platform, new PHEV, new design



2022 Lexus NX350h
Photo courtesy of TMNA

The NX is the first of 20 all-new or updated products planned through 2025. It shares a platform with the Toyota RAV4, moving to the GA-K platform that underpins the latest RAV4, which went on sale in late 2018. Lexus says that 95% of all parts are new. The new NX rethinks the interior, and has a new design and updated powertrains, but Lexus has not yet released all the specifications for the new model. The first-generation NX is offered in the US in either NX300 or NX300h options; the standard was a 235-hp 2.0-litre four-cylinder and the hybrid a 2.5-litre four-cylinder with sealed nickel metal hydride battery. With the 2022 model year, NX powertrains are completely overhauled.

With this generation, and an overall focus on electrification, the 2022 model-year NX adds a plug-in hybrid (PHEV) variant, keeping a standard four-cylinder and a hybrid in the mix. In the US, the NX 350 is the base car, with an all-new 2.4-litre turbocharged four-cylinder engine, delivering 275 hp and 317 lb/ft of torque through a new eight-speed automatic transmission in the NX 350. The new engine is the first Lexus engine to use a centre-injection direct-injection system and close placement of the turbocharger and catalyst to meet stringent fuel economy regulations globally; this engine is offered only with AWD. The new-generation NX also steps up its hybrid offering to the NX 350h, with 239 hp and manufacturer-estimated (US EPA certification is not yet available) 36 mpg fuel economy, up 6 mpg over the first



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generation, and shifts to a lithium-ion battery. Depending on market, the hybrid system will be available with front- or all-wheel-drive configuration. By comparison, when used for the RAV4, there is 219 hp and combined 40 mpg, indicating that Lexus sacrificed some efficiency for power, a reasonable choice for the luxury market. The more powerful and more efficient hybrid uses a 2.5-litre non-turbo gasoline (petrol) engine and two high-torque electric drive motor-generators, enabling all-wheel drive. This electric all-wheel drive is also used for the RAV4. Some markets including Canada, Russia and Eastern Europe, will offer an NX 250 with a 2.5-litre naturally aspirated four-cylinder, as well as the NX 350 and electrified options. The NX 250 will be offered with front- or all-wheel-drive, depending on market.



2022 Lexus 450h+

Photo courtesy of TMNA

The plug-in hybrid is a first for Lexus and related to the RAV4 Prime as well. Lexus badges this model the NX 450h+; although the US will only have an all-wheel-drive version, some markets will have a front-drive version. Of power, Lexus would only say the system “delivers on the performance luxury guests are seeking with an estimated 6.0-second 0-60 time.” The RAV4 Prime offers 302 total system hp, but also claims 42 miles of electric-only range. As with the hybrid, the NX may offer more power for the PHEV, as it has already confirmed a electric-only range of 36 miles, lower than the RAV4 Prime. The NX PHEV can be fully charged on a 240-volt current in 2.5 hours with the optional 6.6 kW onboard charger; the standard 3.3 kW onboard charger will take 4.5 hours. The NX 450h+ will also use predictive efficient drive, which works with the navigation system to learn driving habits, predict the expected roadway and analyse real-time traffic for optimal charging and discharging of the battery. The system also uses driver behaviour learnings to predict when the driver is likely to stop, and increases regenerative braking in those locations. Lexus is offering the F Sport package on the NX 350 and NX450h+ only; the F Sport package is largely cosmetic but does add active variable suspension.

When it comes to passive and active drive systems, the NX adds several functions to the Lexus Safety System and offers a robust system, although it does not add anything new to Lexus or the industry. The Lexus Teammate Level 2+ system debuts on the LS 500h, and is not initially offered on the NX. The NX will have emergency steer assist, left-turn oncoming vehicle detection/braking, right/left turn oncoming pedestrian detection/braking, pre-collision with oncoming vehicle detection, and dynamic radar cruise control with curve speed management. With the NX, Lexus adds road sign assist, pre-collision in low-light situations and lane assist. The NX does also add a system that stops the rear passenger doors from opening if oncoming traffic is detected; a clever safety feature first seen in the US on the Hyundai Santa Fe. The NX also adds an optional seven-inch digital driver instrument cluster and a 10-inch head-up display.

The interior is also completely redesigned, with a driver-focused layout and more space in the rear. Lexus has also joined the long list of luxury automakers offering expanded ambient lighting. The NX offers an optional system with 14 themes and 64 colours. Lexus says the themes have been “carefully selected to express ephemeral emotions and evoke nature-inspired feelings.” The interior also gets new seats, and the shift to the GA-K platform brings improved head and legroom. NX also adds a panoramic moonroof with this generation. The new NX is 4,660 mm long, an increase of 20mm, and has a wheelbase of 2,690 mm, an increase of 30 mm.



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New Lexus Interface developed in North America



2022 Lexus NX
Photo courtesy of TMNA

The Lexus NX is the first vehicle to integrate an all-new connected car solution for Toyota, developed by the Connected Vehicle group of Toyota Motor North America (TMNA). The Lexus NX debuts the system and the first Toyota product to get it launches in fourth quarter 2021. Lexus calls this system “Lexus Interface.” It encompasses solutions for multimedia, navigation, voice assistant and connected car solutions. For the NX, the standard is a 9.8-inch touchscreen with a new “human machine interface” (HMI) that includes stronger emphasis on voice control as well as ensuring menus and function organisation is logical. The graphical user interface (GUI) features animation specific to region, with advanced graphics to distinguish between listening and processing, new designs for multimedia animations and for other functions, sliding menus and dropdown banners. An optional 14-inch centre-stack screen also allows for duplicate climate controls in-screen. Lexus expects its new Virtual Assistant to be the primary method for owners to interact with the system, not unlike assistants from Mercedes-Benz, Audi and BMW. When revealing the system, Toyota Connected Technologies executives noted that they are looking to provide choice for voice control; the integration of Apple CarPlay and Android Auto continue. Lexus uses dual microphones, enhanced noise cancellation, seat detection and speaker location for front-seat occupants to control navigation, media, phone, and vehicle settings including climate control and window opening or closing. TMNA says the new Virtual Assistant combines a hybrid structure of in-house Toyota Connected with a cloud-based platform for up-to-date data content.

Not unlike other automakers, Lexus adds cloud-based user profiles. User profiles and driver settings are saved to the cloud; when the user logs in via a phone, smart key or manual login, those settings are downloaded to the vehicle. Though the NX is the first to offer it, as the system becomes available across more vehicles, the profiles can be accessed in any Lexus equipped with the system – also a function several other automakers are offering. Lexus also adds Digital Key with the new NX, enabling owners to lock/unlock and start/stop the vehicle through the smartphone, within Bluetooth proximity. Lexus enables Digital Key to be shared with up to seven users. The Digital Key function also leverages the cloud-based user profiles, so each of the drivers with access can save preferences.



2022 Lexus NX
Photo courtesy of TMNA

The Lexus Interface moves to cloud capability for navigation, using Google point-of-interest data and enables faster and more accurate directions and mapping – performance should be nearer the experience drivers get from Google



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Maps or Apple Maps through their smartphones, and will also have access to driver data from the User Profile. The Lexus Interface offline mode detects when the vehicle is approaching an area with low connectivity and downloads applicable maps and services in advance, a feature not matched by the cellphone-based navigation. For multimedia, the system is now compatible with Apple Music or Amazon Music, as well as offering radio, streaming services and smartphone music.

The Lexus Interface also offers standard wireless Apple CarPlay and Android Auto. The wireless charging pad is placed in a tray in the centre stack, which can be opened to place the phone and closed when either not in use or charging a phone, to maximize storage and space in the console.

Outlook and implications

The NX is the compact utility in the Lexus line-up, sitting above the UX and below the brand's key RX utility vehicle. This generation will help Lexus to transition to a more highly electrified and connected future, while meeting the needs of current ICE buyers. The new generation gets the benefits of the GA-K platform, which brings flexibility of powertrain, improvements in performance and size, and improvements in manufacturability. The initial specifications and product improvements revealed ensure the latest NX will be more competitive against other luxury makers (and some non-luxury offerings), though even as promising as the new Lexus Interface is, the NX is not where Lexus is making its technological leaps forward. Although all-new for the 2022 model year, the NX is set to meet expectations of today's luxury compact CUV buyers. Lexus' execution of the technology and package, as well as its customer service reputation, are where this vehicle will need to exceed expectations.

Global sales of the first generation peaked at about 174,000 units in 2018 (25% of Lexus global sales), and then slipped to 148,000 units in pandemic-struck 2020. Lexus sells more of the NX in the US than any other country, although mainland China is the second-most-important market, followed by Japan. In 2020, 37.6% of global NX sales were in the US, 23.6% in mainland China and 6.6% in Japan. In the US, the Lexus NX is the second-best-seller in its premium compact CUV segment, behind the BMW X3 but ahead of the Acura RDX and Audi Q5. Those four account for 44% of segment sales, and each exceed 50,000 units per year in US sales.

The new Lexus interface was developed by Toyota's Connected Technologies group in North America, announced in 2017. The Connected Technologies group reports to CEO of Toyota Connected North America, Zach Hicks, and the system they have developed will be rolled out across Lexus vehicles, with a variation expected to also eventually be deployed for Toyota brand products as well. The new Lexus interface aims to address a significant drawback of Lexus products, as prior systems once used joysticks and then moved to touchpad operations. Neither system was particularly intuitive or useful and Lexus has been sorely behind on this front, a fact executives acknowledged while revealing the new system. Lexus' luxury competition has leapfrogged with strong executions of cloud-connected systems with natural voice assistants, big screens and dynamic graphics. At a background event, Lexus demonstrated the system to a group of media and analysts, including IHS Markit. The demonstration suggests that while the execution appears strong and well thought out, it also does not seem to move connected car solutions forward as much as simply bring Lexus (and Toyota) into the game.

[OEM Highlights] Dongfeng PSA begins production of C5 X



Dongfeng PSA has started mass production of the Citroën C5 X at its Chengdu plant in China, reports Automotive News Europe. According to the report, the model is to be built only at this plant and is to be exported to Europe and other Asian countries. The Chengdu factory is also to build a plug-in variant of the model.



Outlook and implications

Citroën revealed the C5 X, a new mid-size car model that reportedly mixes the attributes of a sedan, station wagon, and crossover, at the Shanghai Motor Show this year. The car is 4,805 mm long, 1,865 mm wide, and 1,485 mm tall, with the height being helped by large diameter 720-mm wheels that are fitted with 19-inch tyres. The launch of the C5 X marks Citroën's return to the traditional D-segment mid-size car segment. However, a combination of the foothold that premium brands have in both China and Europe, where this model is to be focused on, and consumer tastes that have drifted towards crossovers and sport utility vehicles in recent years has led to the brand taking this different approach to the category. IHS Markit estimates the total production volume of the C5X in China to be around 9,500 units this year and 12,800 units next year.



[Technology Highlights] Huawei aims to offer driverless car technology in 2025

Chinese telecoms equipment giant Huawei Technologies aims to offer driverless passenger car solutions by 2025, reports China Daily. Wang Jun, senior executive at Huawei's smart vehicle unit, said, "Driverless vehicles are the ultimate goal of autonomous driving, and we are working to make passenger vehicles driverless in 2025".



Outlook and implications

Huawei is seeking to expand its presence in the automotive industry and recently announced plans to invest USD1 billion in research and development (R&D) into components for smart cars this year. At the Shanghai Motor Show 2021, the company unveiled its Huawei HI intelligent automotive solution, which consists of a computing system, 4D imaging radar, autonomous vehicle (AV) platform, and intelligent thermal management and runs on Huawei's Harmony OS and LiDAR chip. The telecoms company has also partnered with three automakers – BAIC BJEV, Changan Automobile, and GAC Group – to jointly introduce autonomous car brands from the end of 2021. The company claims that its intelligent car unit has 5,000 employees dealing with R&D, with 2,000 focusing on autonomous technologies.

[Technology Highlights] SAIC partners with supplier of display products to build new smart mobility ecosystem

SAIC Motor has partnered with BOE Varitronix Limited, a supplier of automotive display products, to develop a new smart mobility ecosystem based on intelligent auto cockpit, according to Gasgoo. The two will jointly work on research and development (R&D) of centrally mounted curved displays, flexible organic light-emitting diode (OLED), and transparent window displays for automotive smart cockpit.





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Outlook and implications

SAIC intends to create a new ecosystem for the development of its R-branded electric vehicles (EVs), leveraging its partnerships with leading tech companies such as Alibaba Group, NVIDIA, Luminar, and Tencent. The automaker launched its new technology brand R-TECH during a company event held in March in Shenzhen (China) to outline technology strategies for its R brand. Other Chinese automakers such as Geely, Changan, BAIC, and Great Wall Motor are also focusing on development of smart vehicles. This is in line with China's aim to commercialise autonomous smart vehicles, which are a key part of the country's "Made in China 2025" plan. In February 2020, 11 central government departments jointly issued the "Strategy for Innovation and Development of Intelligent Vehicles", providing a more realistic vision for the development of autonomous vehicles (AVs). The strategy is aimed at developing an ecosystem for AVs and ensuring that conditional AVs (Level 3) are in large-scale production by 2025.



[EV Highlights] Lincoln brand aims for 50% of global sales to be EVs in 2030

IHS Markit perspective

Implications Following the announcements on the Ford+ plan during Ford Investor Day on 26 May, the Lincoln brand has provided details of its plans for a full portfolio of connected and electrified vehicles by 2030.

Outlook Much of Lincoln's plan mirrors the basic elements of the Ford+ plan announced in May, although Lincoln is deploying its plan with nuances designed for its luxury customers. Overall, the story for the Lincoln brand is essentially the same as for the mainstream brand: a shift to electrified propulsion and leveraging connectivity to offer more services to customers throughout the life of vehicle ownership and potentially cars that become better over time as a result of these improvements.

The Lincoln brand has provided details of its plans for a full portfolio of connected and electrified vehicles by 2030, following the announcements on the Ford+ plan during Ford Investor Day on 26 May.

Lincoln is aiming for 50% of the brand's global sales to be battery-electric vehicles (BEVs) in 2030. With parent Ford, Lincoln is moving towards what the companies call an "always on" relationship with the consumer. Lincoln is to brand its over-the-air (OTA) update and connected subscription services as the Lincoln Intelligence System, with the first updates to the Nautilus due in mid-2021. The Nautilus will receive updates to navigation functionality and Apple CarPlay, as well as a digital owner's manual. In addition, the Nautilus will receive an update to Alexa in the third quarter of 2021. Lincoln plans eventually to add to its models a hands-free driving system called ActiveGlide, available to use in prequalified sections of divided highways called Hands-Free Blue Zones. However, Lincoln has not indicated which of its product lines is to receive the feature first.



IHS Markit participated in a discussion session with Lincoln executives on the brand's plans. The Lincoln executive team said that the Lincoln Zephyr Reflection concept, displayed at the 2021 Shanghai Motor Show, is very representative of future Lincoln design, but this sedan is not being considered for the US market. The model is planned for China, where sedans are more significant in the market. The Lincoln executives confirmed that Lincoln is due to have four products on the upcoming Ford all-wheel and rear-wheel-drive EV architecture that the company confirmed at its Investor Day in May. The timing of the product rollout has not been confirmed, but Lincoln president Joy Falotico said that the four products would be Lincoln's "anchor products". She suggested that the Corsair, Nautilus, Aviator, and Navigator names might be migrated to the EV products. Falotico also said that Lincoln sees opportunities for derivative products, but declined to indicate what these might be or if the brand had made a specific decision to pursue any of them. Lincoln did confirm that the first EV would "join the plug-in Aviator and Corsair SUVs [sport utility vehicles], as the brand shifts toward electrification". Although Lincoln says that ICEs will still be part of its product mix, the brand's full portfolio is to be electrified by 2030. This suggests that Lincoln will have only a mixture of hybrid vehicles, plug-in hybrid electric vehicles (PHEVs), and electric vehicles (EVs) as soon as nine years from now. When asked why Lincoln expects 50% of its global sales to be EVs by 2030, compared with Ford's target of 40%, the brand says it is largely



because there is a faster adoption rate of EV propulsion systems among luxury vehicle buyers. The brand says it is also because of the opportunity that EV propulsion offers to elevate Lincoln's Quiet Flight philosophy.

As well as adding OTA updates and connected services, Lincoln is updating its Lincoln Way app to offer more services. In addition, Lincoln stated that it is opening boutique centres where consumers can experience Lincoln vehicles with less pressure than at a traditional dealership, although sales will still take place at traditional dealerships. Unlike startup luxury automakers that do not have dealers as partners and must support retail centres directly, Lincoln is working with its dealers. In the case of the boutique centres, the sites are owned and operated by nearby dealers and not by Lincoln, preserving the dealers' buy-in and participation.

Outlook and implications

Much of Lincoln's plan mirrors the basic elements of the Ford+ plan announced in May, although Lincoln is deploying its plan with nuances designed for its luxury customers. In some ways, Lincoln is positioned to benefit from faster scaling up of the backbone technologies needed to support the new vehicles and services. The luxury brand may appear slightly behind its parent in deploying some of these key technologies. However, a benefit of this could be that some of the more problems of rolling out new services and technologies may be resolved by the Ford brand and the issues corrected in time for the launches by Lincoln. Overall, however, the story for the Lincoln brand is essentially the same as for the mainstream brand: a shift to electrified propulsion and leveraging connectivity to offer more services to customers throughout the life of vehicle ownership and potentially cars that become better over time as a result of these improvements.



The system that Lincoln is calling the Lincoln Intelligence System mirrors Ford's Power-Up programme, and Lincoln is also to offer built-in Amazon Alexa. In addition, the Lincoln ActiveGlide hands-free system is known as BlueCruise by Ford. As much of the background support for these programmes is scaled by the broader Ford deployment, Lincoln has the opportunity to improve costs and perhaps roll out some features more quickly than a more independent luxury brand might. On the other hand, Ford is again announcing key technologies and systems for the Ford brand first, leaving deployment by its luxury brand to follow.

[EV Highlights] Evergrande, Sinopec team up to establish EV charging stations

China's Evergrande Group has partnered with oil firm Sinopec Group for construction of electric vehicle (EV) charging and battery swapping facilities, reports Gasgoo. According to the agreement, the partners will use their expertise in the area of energy, technologies, referral traffic, and sales network to jointly work on the development of an EV charging



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network. They will also co-operate on automotive lightweight materials, and new high-performance building and chemical materials.



Outlook and implications

Evergrande has been working aggressively for the past couple of years to make inroads into China's booming EV sector. In June 2019, it announced plans to build a CNY160-billion production complex for EVs and related components in the southern Chinese city of Guangzhou. The site will boast an EV plant with an annual production capacity of 1 million vehicles, a 50-GWh-capacity "super-factory" for EV battery production, and facilities supplying electric motors and control systems to 1 million EVs annually. Last year, Evergrande also unveiled six new electric models to be introduced by its Hengchi brand. Developing charging infrastructure will help Evergrande promote its vehicles in the Chinese market. The company has already partnered with China's State Grid Corporation to launch smart energy services in Shenzhen, China, to set up NEV charging poles at parking spots in residential areas covering about 8.7 million households. Recently, another Chinese EV startup NIO signed a partnership agreement with Sinopec to set up battery-swapping stations. The company claims that the battery swapping station allows vehicles to manoeuvre into the station automatically and enable users to complete a self-service battery swap with only one click while staying in the car.



[GSP] ASEAN Sales and ASEAN Production Commentary-2021.5

ASEAN sales

April 2021: +376.9%; 237,594 units vs. 49,822 units

YTD 2021: +26.0%; 905,210 units vs. 718,341 units

Light vehicle sales in the Association of Southeast Asian Nations (ASEAN) recorded about 238,000 units in April 2021, marking an increase of 377.0% compared with April 2020. In January–April 2021, the market increased 26.0% to about 905,000 units. The ASEAN market will likely increase 12.0% to about 2.77 million units in 2021.

Thai light vehicle sales in April 2021 increased 94.2% year on year (y/y), to about 57,100 units. April 2021 sales appear much better than April 2020, when the country was in the strictest lockdown. In April 2021, the Thai consumer confidence index decreased from 48.5 points to 46.0—the lowest since October 1998 owing to the impact of the latest wave of the COVID-19 pandemic. The confidence index will not likely be much improved in the coming months amid the currently surging number of cases, while the full vaccination rate was at only around 1% of the total population as of 16 May 2021. The Bank of Thailand just downgraded Thailand's 2021 GDP forecast to 1–2% based on the latest update and projection of consumer spending, the vaccination rollout, and inbound tourist arrivals. Faster vaccinations and sooner herd immunity could help economic growth in 2021–22.



Vehicle sales during January–April were 248,600 units, which was a 10% y/y increase. Sales during the first half of 2021 were affected by the current COVID-19 pandemic and production slowdowns owing to the global semiconductor shortage issue at many OEMs, including Honda, Mazda, Nissan, and Suzuki. On the other hand, the strong momentum from pent-up demand since late fourth quarter 2020, along with the motor show in March, will likely draw some demand and year-on-year growth owing to the low base in 2020 due to the strictest containment measures. In the second half of 2021, a more challenging issue that threatens consumer confidence and spending is whether the government can control the spread of the COVID-19 virus and timely manage the vaccine rollout, as well as provide aid to consumers, small and medium-sized enterprises (SMEs), the unemployed, and tourism businesses that have suffered high costs and lost tremendous income for almost a year from the lack of foreign tourists. The growing economy and global trade will push exports to again become one of the key contributors to the Thai economy in 2021. However, shipping container shortages could be a threat to product delivery performance. The main segment driver in 2021 is expected to be the country's product champion—the pickup truck segment. The high recovery momentum of pickup trucks since 2020 will continue, along with new product updates from OEMs that will attract consumers. Unemployment in big cities has forced people to return home to small towns to start small local businesses using pickups for operation, and the fast-growing e-commerce business and in-home delivery services have also supported pickup demand. That said, xEVs continue to interest consumers more, according to the global trend of electric car popularity during the COVID-19 outbreak. Concerns over PM2.5 pollution problems in Thailand also contribute to their popularity. Hopefully, new launches of battery-electric vehicles (BEVs) from the ORA brand under Great Wall Motors (Thailand) with an affordable price range in 2021 and 2022 could attract more target customers, including middle-income customer groups, and increase more BEV-segment sales. Sales in 2021 are expected to reach 0.79 million units, marking a 2.5% y/y



increase. However, IHS Markit analysts will likely downgrade Thailand's sales forecast in the next round to reflect the intensity of the COVID-19 pandemic wave, the slowdown of the economy, and slow spending on luxury goods.

In the short term, even as the effects of the COVID-19 virus will continue pressuring the economy, businesses, and consumer behaviors, IHS Markit analysts expect expedited sales growth during 2022–24 because of the low base in 2020–21. Sales should also be supported by the new elections, urban expansion after the completion of the megaproject on public transportation, and substantial overseas investments to join the Eastern Economic Corridor (EEC)—Thailand's new flagship economic zone. Urban expansion will continue, especially in cities that are bordering provinces that have gained free-trade and labor opportunities after the creation of the ASEAN Economic Community. The government's automotive policy supporting the eco-car program and the electric vehicle (EV) scheme will likely contribute to Thai market demand in the short and long terms. OEMs that successfully join the scheme will reap benefits in terms of reduced import tariffs on machinery, raw material privileges, and corporate income tax exemptions in return for local production of hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs), BEVs, and EV components. In the longer term, IHS Markit analysts forecast the automotive industry will grow at a slower pace as penetration levels and public transportation—especially the Skytrain in Bangkok—expand. In addition, there are more concerns about limited roads, high traffic congestion in big cities, and the growing number of alternative services for car sharing—Uber and GrabTaxi will be threats in the future.



In April 2021, Indonesia's light vehicle market jumped 894.0% y/y, to 73,000 units, compared with the low base in April 2020, when the automotive industry began to be depressed because of the impact of the COVID-19 pandemic. Sales increased mainly because of the new incentive of the luxury sales tax discount on 2WD and 4WD vehicles with engines between 1,501 cc and 2,500 cc. This relaxation is in addition to the reduction for sedans and 2WD cars with engines less than 1,500 cc starting March 2021. Eligible 2WD vehicle buyers will receive a 50% discount during April to August, then 25% during September to December. Eligible 4WD vehicle buyers will enjoy the benefit in the same period, but with a discount of 25%, then 12.5%. Moreover, Indonesia's consumer confidence index rose in April, exceeding 100 points, indicating optimism returning for the first time in the year. The increase was due to a better perception of the current economic conditions, including job availability and higher income. Although first-quarter 2021 GDP contracted 0.74%, the result was better than fourth quarter 2020, with a 2.19% decline, as the government continued its fiscal support and ramped up the COVID-19 vaccination drive to allow people and businesses to bounce back from the pandemic. For the year-to-date (YTD) performance, the Indonesian market increased 8.0% y/y, to around 247,000 units. For the full-year 2021 forecast, the Indonesian vehicle market will reach about 0.72 million units, for a 45.0% y/y increase. The main factors influencing this year's performance are government stimulus packages to counter the further impact of the pandemic, especially for the automotive sector; more crucial model launches in popular segments to attract consumers' interest; the vaccination program against COVID-19 to boost consumer confidence and spur the economy (the country started mass vaccinations during the third week of January 2021, and the two-dose vaccine will be free for all Indonesian citizens); and the corporate income tax cut since 2020 to attract investment and create more jobs. In the short-to-medium term, Indonesian car sales should continue to rise owing to robust demand, product refreshments, expectations of a further corporate tax cut, and public infrastructure improvement. For the longer term, the market should grow from a rising middle class. Considering the penetration rate is still low in the country, there remain plenty of opportunities for further growth in the years ahead. However, mass rapid transit (MRT) programs may



result in consumers prolonging the decision to buy a new car, since MRT can accommodate many people at the same time through business areas that currently face severe traffic jams.

ASEAN production

April 2021: +457%; 269,143 units vs. 48,323 units

YTD 2021: +21.8%; 1,185,229 units vs. 973,383 units

The Association of Southeast Asian Nations (ASEAN) region's light vehicle production significantly grew 457% year on year (y/y), with 269,143 units, in April 2021, given the low base of comparison in April 2020 during the lockdowns across the region amid the COVID-19 pandemic. Year-to-date (YTD) production for the four months of 2021 recorded 1.18 million units, up 21.8% y/y. In the May forecast update, ASEAN's 2021 light vehicle production forecast has been revised up by 79,000 units, largely driven by the robust domestic demand in Indonesia and Malaysia in light of the governments' tax reduction for locally assembled vehicles in a bid to stimulate auto demand post the sharp decline in 2020, given the consequences from the pandemic crisis. Despite the slight forecast upgrade for Thai production on the back of resilient export momentum during the second quarter, the country is now facing the third wave of COVID-19 infections, putting pressure on the recovery pace for 2021. However, ASEAN's 2021 light vehicle production should reach nearly 3.4 million units, growth of 20.6% y/y, thanks to the post-pandemic global economic recovery outlook, the government's schemes to support the automotive industry, and COVID-19 relief measures.

Thailand's light vehicle production in April 2021 significantly grew 361% y/y, or 106,647 units, owing to the low base of comparison in April 2020. Its YTD production April was up 22.2% y/y, with 0.57 million units produced, driven by improved domestic demand, as well as strong export momentum of pickups and sport utility vehicles (SUVs).



[Supplier Trends and Highlights] Foxconn's subsidiary invests in Gigasolar Materials to develop EV battery materials

The two companies will jointly develop materials for electric cars



Source: Getty Images Plus/metamorworks

Taipei-based electronics contract manufacturer Foxconn's subsidiary has invested USD36 million in Gigasolar Materials Corp to develop electric vehicle (EV) battery materials, Reuters reported on 15 June.

According to the news agency, Foxconn said the investment via a private placement through a Taiwan-based subsidiary will make it the second-largest shareholder in Gigasolar Materials, a Taiwan-based company known for manufacturing solar cell materials.

The two companies will jointly develop materials for electric cars, Reuters reported quoting a statement from Foxconn on Tuesday.

Outlook and implications

The maker of Apple iPhones, which has identified EVs as an emerging business for future growth, has struck deals with several carmakers including Stellantis and PTT Group, Thailand's state-run energy company. Foxconn aims to provide components and services to 10% of the world's electric cars by 2025 to 2027, the company's chairman Liu Young-way had said in October 2020, vowing to lower manufacturing and other costs as EVs are expected to become mainstream in the future.

In May, Foxconn signed a Memorandum of Understanding (MoU) with PTT Group to collaborate in setting up an open platform for producing EVs and key components to serve the emerging sector in Thailand. The platform, comprising hardware and software services, would be available to all the auto companies in Thailand looking to accelerate their production and sales of EVs in Thailand and elsewhere in the ASEAN region, Foxconn had said in a statement on May 31.

It had also signed framework agreements with American EV startup Fisker Inc in May wherein it would support joint development and manufacturing of the latter's project PEAR, which stands for personal electric automotive revolution. Fisker's project Pear is a program to develop a new breakthrough EV.

[Supplier Trends and Highlights] Webasto to produce cell modules for new battery storage system of Solarwatt



On behalf of Solarwatt, Webasto manufactures cell modules deployed in the BMW Group vehicles



Source: Webasto

Supplier of sunroofs, electric heating systems, charging and battery solutions to the automotive industry, Webasto plans to manufacture cell modules for the Dresden-based manufacturer of photovoltaic systems, Solarwatt under a cooperation agreement, the company said in a press release on 14 June.

“In the coming years, the Webasto plant in Schierling, Germany, will manufacture six-figure number of cell modules for Solarwatt. The cooperation includes installations and sales of charging solutions, besides energy management solutions,” the company stated.

Webasto said that its Schierling unit, where around 120–340 employees currently work in the battery production unit, produces battery systems and sunroofs for up to six days a week.

The company manufactures cell modules for Solarwatt, which are also deployed in the BMW Group vehicles, on a specially equipped production line, it stated, adding that “the components come from BMW and are used according to Solarwatt’s specifications for a cell module, which is then used in the stationary home storage system Solarwatt Battery flex.”

Outlook and implications

Webasto’s collaboration with Solarwatt covers energy management, installations and sales of charging solutions. The company said that its Live charging stations are compatible with Solarwatt’s energy manager, which means that the customers would be able to charge their electric vehicles with self-generated solar energy in the future.

According to the company, over 100 Webasto Live charging stations have already been sold as part of the cooperation. It is expecting to sell around 1,000 such charging stations by the end of 2021.



[VIP ASSET] Semiconductor supply issue: Light-vehicle production tracker



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Reports of disruption within the supply chain of semiconductors to the automotive sector began in late 2020 and have continued into the second quarter of 2021, with some expecting a weaker outlook into the third quarter as well. Pressure built up as the automotive industry recovery from the widespread coronavirus disease 2019 (COVID-19) virus pandemic-related lockdowns experienced during the first half of 2020 clashed with increasing demand from the wider consumer electronics sector, itself recovering strongly and, late in the year, building stocks for the holiday season. The situation has been further exacerbated by other factors, including the fire at Renesas' Naka (Japan) facility on 19 March and ongoing disruption following the severe weather that hit the southwest US in February.

Many OEMs have been affected by this situation and will continue to be so. Here is a selection of key automakers that have been hit, the steps they have taken to mitigate the situation and their expectations for the remainder of the year.

FORD

Ford has been heavily hit by the shortage at its sites both in North America and Europe. In North America, multi-week stoppages had taken place in the first quarter of the year, and these are spreading across more sites in the second quarter. This takes in such important models as the Explorer; the new Bronco Sport and Bronco; and the F-Series and Ranger pick-ups. This also now includes the Ranger pick-up and new Bronco, as well as the evergreen E-Series commercial vehicle.

All the automaker's sites in Western and Central Europe have been affected by multi-week stoppages continuing into the second quarter of the year, hitting models like the Kuga and Transit Connect manufactured at Valencia (Spain), the sub-compact crossover built in Craiova (Romania); and Transit and Transit Custom site in Kocaelli-Otosan (Turkey). This is also hitting its German sites in Saarlouis which builds the Focus and Cologne which manufactures the Fiesta; the latter is now set to stop in the third quarter related to the summer shutdown.

During the announcement of first-quarter financial results on 28 April, Ford said that the shortage contributed to a fall in its wholesale deliveries of 5.7% year on year (y/y) as it lost around 200,000 units of planned production. Chief Financial Officer (CFO) John Lawler underlined the even more difficult situation in the second quarter of the year, with around 50% of planned production to be lost, or around 700,000 units. It also anticipates the loss of another 10% of planned production, or around 200,000 units, in the second half of 2021, and said that it no longer



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expects to be able to recover production lost in the first half at this point. For the full-year 2021, Ford now assumes a production loss of 1.1 million units. It also indicated that the situation would lead to a USD3.0-billion negative impact to free cash flow.

General Motors (GM)

GM's production has been affected across its operations in North America, South America and Asia as a result of the shortage. Multi-week stoppages have occurred and, in some cases, continue at locations in the US, Mexico and Canada. However, some will now resume earlier than expected highlighting how uncertain component supplies can be during this crisis. GM has not been subject to any notable disruptions at the sites that build its full-size pick-up and sport utility vehicle (SUV) models up now, as it prioritizes these important and profitable models.

There are also significant ongoing disruptions at its Brazilian operations, with the Gravatai (Brazil) facility in the middle of a stoppage that will have lasted for around four months if production resumes as planned in July. Elsewhere, its two sites in South Korea have had output reduced at various times during the first two quarters, while in China, there have been limited disruptions to production at its SAIC-GM joint venture (JV) in the second quarter.

At the announcement of its first-quarter 2021 financial results, GM also said that it expects to see the worst of the semiconductor shortage in the second quarter of 2021, and an improvement in the second half of 2021. CFO Paul Jacobson did acknowledge that this could drag on into the third quarter of 2021 though. However, the company has been looking at workarounds to these issues including using alternative microchips, if possible, or re-engineering to make them unnecessary, and reserving supplies for high-margin and high-demand products. GM is also producing some vehicles without the modules affected by the shortage, with plans either to add the modules later, or in certain instance supply them without, which has been the cause of some of full-size pick-ups being built without a fuel management module.

Renault-Nissan-Mitsubishi

All the partners of the Renault-Nissan-Mitsubishi Alliance have been affected by the shortage of semiconductors to some degree. The Renault Group's operations in Europe have been especially affected in Spain, with downtime earlier in the year being followed by preparations for stoppages into the third quarter. Its LCVs and BEVs have been among the models affected at its domestic French sites, while those in Central Europe have included its low-cost Dacia brand focused on Pitesti (Romania). A more modest impact has been felt at some of its other sites around the world.

Nissan has been seeing challenges at some of its Japanese sites, although this is primarily focused on the second quarter of the year. As well as some downtime being implemented, it is using a range of other measures to pull back output such as reducing overtime, holiday working, and the line speed. North America will also adjust production, focusing on the second quarter. Locations in other parts have also been, and will be, hit by reductions. This includes the Sunderland (UK) facility that builds the important Qashqai and Juke crossovers as well as the Leaf BEV for the European market.



Mitsubishi is also managing output of its kei-cars and crossovers in Japan, as well as models built at its sites in Thailand.

On the announcement of Renault Group's first-quarter 2021 financial results in late April, CFO Clotilde Delbos was quoted as saying during a presentation, "Two months ago we said we think the peak will be the second quarter, but we think there will be a lingering effect in the third quarter if not further". She added, "The visibility is deteriorating" and said, "We don't want to give any estimates that might be wrong very quickly". However, Delbos did say that Renault expected to lose production of "tens of thousands" of cars because of the problem and is prioritizing its most profitable models.

When Nissan announced its financial results during the second week of May, it said that it had lost around 130,000 units of volume during the fiscal year (FY) that ended 31 March. Its CEO Makoto Uchida has also suggested that it could lose around 500,000 units of production during the first half of its FY ending March 2022, although it also hopes to claw back half of this amount in the second half.

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[VIP ASSET] India's role in global automotive electrification



[This article was first published on AutoCarPro.In]

Electrification has quickly emerged as one of the key global megatrends across the industry and is a contributor to the disruptive era in the automotive and mobility sectors.

Mature markets such as Europe and Greater China are taking significant steps to transition their vehicles to the electric age, and their consumer markets have responded enthusiastically. India is slightly behind the curve compared with the e-mobility leaders but is betting on mass-scale electric mobility.

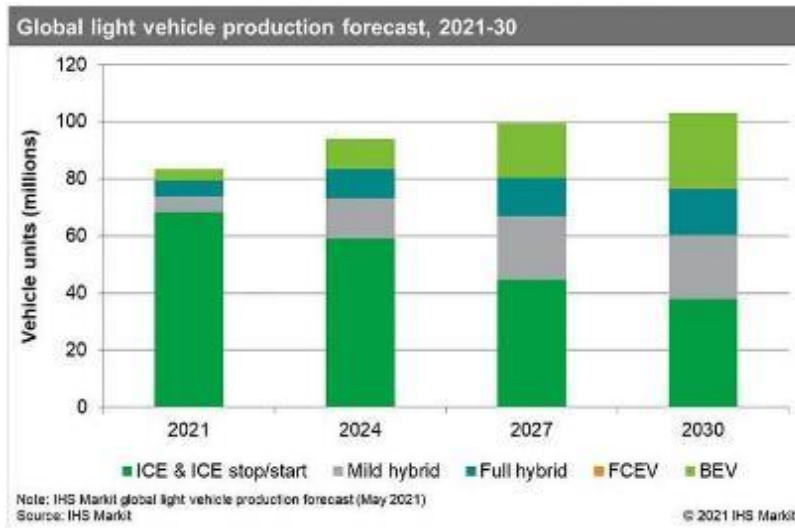
Darshak Parikh, Senior Research Analyst - E-Mobility, IHS Markit and Raghunandan Balasubramanian, Senior Research Analyst - Powertrain, IHS Markit explore India's growing electric vehicle (EV) industry and how the country's supplier and component community can tap into new opportunities.

Growth projection

The production of alternative powertrain (AP) technologies—consisting of mild hybrids, full hybrids, battery electric vehicles (BEVs), and fuel cell electric vehicles (FCEVs)—should increase from 15 million units in 2021 to 65 million units by 2030 globally.



During the same timeframe, the production of non-electrified internal combustion engine (ICE)-based vehicles, including ICE stop/start vehicles, will significantly decline from 68 million units in 2021 to 38 million units by 2030.



The AP (alternative powertrain) industry in India is still developing, with limited availability and affordability of electrified vehicles. However, by 2030 one in every four vehicles produced in India should leverage some form of alternative propulsion, with mild hybrids forecast to hold the dominant market share among all AP vehicles.

To fulfill the demand of electrified vehicles production, India will require around 1.8 million electric motors and 11GWh battery capacity by 2030, of which around 260,000 electric motors and 10.5GWh battery capacity are expected for the production of BEVs.

Evolution of the AP component industry

AP component technologies have already reached a level of maturity that supports mass-market adoption and large-scale production of electrified vehicles.

For full-hybrid and battery electric vehicles, the use of permanent magnet motors should remain widespread, owing to their higher torque density, better efficiency, and smaller packaging envelope. In a similar fashion, increasingly nickel-rich chemistries for battery cells, such as NMC622 and NMC811, are likely to be the preference of most mainstream automakers globally.

Moving forward, to support a significant increase in AP component demand, suppliers and OEMs will have to quickly develop components and technologies and scale up their production to keep pace with the momentum.

We have witnessed new and interesting strategies, collaborations, and joint ventures among component suppliers to expand their offerings and capture the new markets as and when they arise. A case in point is the e-axle domain where electric motor, inverter, and transmission suppliers have increasingly joined hands to provide integrated electric propulsion solutions.



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New joint ventures and other partnerships will also enable the constituent companies to leverage common or complementary synergies and develop or expand into new products, services, and business areas. Meanwhile, divestments and spin-offs allow companies to shift more focus and capital to growth areas such as e-mobility.

Furthermore, consolidation of business practices may also be a prudent move from a financial perspective. Through mergers and acquisitions, horizontal, or vertical integration, companies can strengthen business lines and increase market share.

Finally, by obtaining government support such as exemptions, subsidies, and schemes, companies can ease the financial burden of establishing new businesses in emerging sectors such as this.

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