



IHS Markit®

Automotive Industry Weekly Digest

11-15 January 2021





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[OEM Highlights] Toyota introduces three-cylinder engine to Corolla line-up in China

Toyota has introduced a 1.5-litre engine to its Corolla lineup in China. The 1.5-litre three-cylinder engine will be available in three trim versions of the 2021 Corolla line-up with a starting price of CNY109,800 (USD16,999). The engine will be paired with either a six-speed manual transmission or an automatic continuously variable transmission. The automaker said the new engine provides outstanding fuel economy performance with estimated fuel consumption at 5.1 litres per 100 km. The 1.5-litre engine will expand the Corolla's powertrain options, which previously consisted of a 1.2-litre turbocharged gasoline (petrol) engine and a 1.8-litre naturally aspirated gasoline engine. The 1.8-litre engine, however, is only available on the Corolla Hybrid, featuring the automaker's full hybrid technology.



Outlook and implications

Toyota's move to introduce a three-cylinder engine to the Corolla, its best-selling sedan, in the Chinese market will be tested in the next few months as many Chinese consumers still believe that three-cylinder engines run less smoothly than four-cylinder engines. Toyota says the 1.5-litre engine is specifically designed to meet the requirements of its Toyota New Global Architecture (TNGA)-based models, thus providing improved power performance and better fuel economy. According to Toyota's production plan, it will complete the expansion project of its Tianjin engine plant by March 2021. The project will allow Toyota to increase the plant's engine production capacity by 540,000 units per annum for the production of 1.5-litre, 2.0-litre, and 2.5-litre TNGA engines in China. The 1.2-litre turbocharged engine, which is currently used in the Corolla, will no longer be produced at the Tianjin engine plant when the expansion project is completed. Tighter emission regulations in China are the main reason for automakers to introduce downsized, small-displacement engines to their vehicle line-ups. The Corolla has long been Toyota's most popular model in the Chinese market. IHS Markit data indicate that sales of the Toyota compact sedan contracted by 2% to 317,484 units in the first 11 months of 2020, remaining the top-selling model in Toyota's China line-up.



[OEM Highlights] Hyundai Motor Group says its global sales declined 11.8% y/y in 2020, aims to accelerate transformation into future mobility solutions provider

IHS Markit perspective

Implications	Hyundai Motor Group depends on overseas markets for nearly 85% of its global sales volumes but is facing severe pressure in these markets largely because of production disruption, weak demand caused by a contraction in consumer spending, and the sluggish global economy amid the coronavirus disease 2019 (COVID-19) virus pandemic.
Outlook	IHS Markit projects that Hyundai Motor Group's global light-vehicle sales – including the Hyundai, Kia, and Genesis brands – will reach 7.02 million units in 2021, up 10.4% year on year (y/y) from an estimated 6.36 million units in 2020.

Hyundai and Kia's combined global vehicle sales in December 2020 stood at 592,226 units, down 5.4% y/y from 626,282 units in December 2019, according to separate data releases issued by the two companies and compiled by IHS Markit. Hyundai posted a decline of 6.4% y/y in its global vehicle sales last month to 373,970 units. Of this total, domestic sales accounted for 68,486 units, up 3.2% y/y, while overseas sales declined by 8.3% y/y to 305,484 units.

Kia's global sales decreased by 3.8% y/y to 218,256 units in December. Its domestic sales plunged 20.9% y/y to 38,857 units, while its overseas sales increased by 1.0% y/y to 179,399 units.

Hyundai and Kia's global vehicle sales

	Dec 2020	Dec 2019	Y/Y change %	Full year 2020	Full year 2019	Y/Y change %
Hyundai	373,970	399,453	-6.4	3,743,514	4,425,528	-15.4
Kia	218,256	226,829	-3.8	2,607,337	2,772,076	-5.9
Total	592,226	626,282	-5.4	6,350,851	7,197,604	-11.8

Source: Company press release; excludes CKD unit sales.

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Combining the monthly sales data for the two automakers, Hyundai and Kia's domestic sales stood at 107,343 units in December, down 7.0% y/y from 115,465 units in December 2019, while their overseas sales were down by 5.1% y/y to 484,883 units.

During the full year 2020, Hyundai's global sales were down 15.4% y/y at 3.74 million units. Its domestic sales increased by 6.2% y/y to 787,854 units, while its overseas sales plunged 19.8% y/y to 2.96 million units. Kia's global sales for the full year were down by 5.9% y/y at 2.61 million units, split between a 6.2% y/y increase in domestic sales to 552,400 units and an 8.7% y/y decrease in overseas sales to 2.05 million units. Kia's top-selling vehicle last year was the Sportage sport utility vehicle (SUV) with sales of 366,929 units, followed by the Seltos SUV with 328,128 units and the K3 (Forte) sedan with 237,688 units.

Combined global sales of Hyundai and Kia in 2020 stood at 6.35 million units, down 11.8% y/y. This was split between a 6.2% y/y increase in the domestic market to 1.34 million units and a 15.6% y/y drop in overseas markets to 5.01 million units.



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Hyundai and Kia's domestic vehicle sales

	Dec 2020	Dec 2019	Y/Y change %	Full year 2020	Full year 2019	Y/Y change %
Hyundai	68,486	66,335	3.2	787,854	741,842	6.2
Kia	38,857	49,130	-20.9	552,400	520,205	6.2
Total	107,343	115,465	-7.0	1,340,254	1,262,047	6.2

Source: Company press release; excludes CKD unit sales.

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Hyundai and Kia's overseas vehicle sales

	Dec 2020	Dec 2019	Y/Y change %	Full year 2020	Full year 2019	Y/Y change %
Hyundai	305,484	333,118	-8.3	2,955,660	3,683,686	-19.8
Kia	179,399	177,699	1.0	2,054,937	2,251,871	-8.7
Total	484,883	510,817	-5.1	5,010,597	5,935,557	-15.6

Source: Company press release; excludes CKD unit sales.

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Hyundai Motor Group to accelerate its transformation into a future mobility solutions provider in 2021

Hyundai Motor Group will accelerate its drive to transform itself into a future mobility solutions provider this year, according to a company press release. "We should all stay true to our mission, which is realizing humanity's dream of 'safe and free mobility as well as a peaceful life,'" said Hyundai Motor Group chairman Chung Eui-sun, adding, "2021 should be the year in which we kick-start our great transformation into a new growth engine." He also expressed confidence that 2021 will be a decisive year for Hyundai Motor Group as a catalyst for long-term sustainable investments and innovations. "We have to therefore think of 2021 as an inflection point for shaping our future growth and prepare ourselves to become the first mover in a new era," said Chung.

The automotive group will focus on securing a bigger share of the market for environmentally friendly vehicles and future mobility technologies as it looks to become a leading mobility company. To strengthen its presence in the eco-friendly vehicle market, Hyundai Motor Group will launch electric vehicles (EVs) built on its electric-global modular platform (E-GMP), a dedicated EV architecture. These new EV models include Hyundai Motor's IONIQ 5, Kia's crossover EV, and the Genesis luxury brand's crossover EVs, and they will all come with a battery that enables driving of more than 500 kilometres on a single charge and ultra-fast charging to 80% capacity within 18 minutes.

Hyundai Motor Group plans to expand its EV line-up from the current eight models to 23 by 2025 and aims to sell 1 million units annually in global markets. Currently, the group's battery electric models are Hyundai's Kona EV and Ioniq Electric, as well as Kia's Soul EV and Niro EV. Last month, Hyundai said it would invest KRW60.1 trillion (USD55.2 billion) by 2025 to strengthen its EV line-up, and that it aimed to capture an 8-10% share of the global EV market by 2040. IHS Markit expects Hyundai Motor Group's global EV production to grow to around 827,600 units in 2025, up from an estimated 156,000 units in 2020.



The company will also accelerate the building of EV infrastructure. Hyundai Motor Group will set up 20 high-speed charging stations in South Korea by 2021 and will further expand its charging network in co-operation with energy companies. Overseas, the automotive group plans to optimise EV charging infrastructure for market-specific environments with various partners, including IONITY, Europe's leading high-power charging network, in which Hyundai has made a strategic investment. Furthermore, Hyundai will accelerate the creation of a hydrogen energy ecosystem. It will expand the supply of hydrogen fuel-cell systems with the world's best technology as power sources for ships, generators, and trains as well as global automakers. It recently introduced a dedicated HTWO brand for fuel-cell systems as part of these efforts. Through strategic partnerships with global companies specialising in hydrogen, energy, and logistics, the automotive group aims to take the lead in hydrogen-related projects. It will also focus on developing next-generation hydrogen fuel-cell systems, which will be applied to future eco-friendly mobility solutions such as urban air mobility (UAM).

In other efforts to become a future mobility leader, Hyundai plans to start applying Level 3 autonomous vehicle technologies to its models in 2022 and push for commercialisation projects for autonomous vehicle technologies such as robotaxi services in 2023. Motional, a joint venture between Hyundai and Aptiv, plans to conduct Level 4 driverless tests on public roads in Nevada (United States). In 2023, the company will work with US car-sharing provider Lyft to launch autonomous vehicle commercialisation services in major US regions.



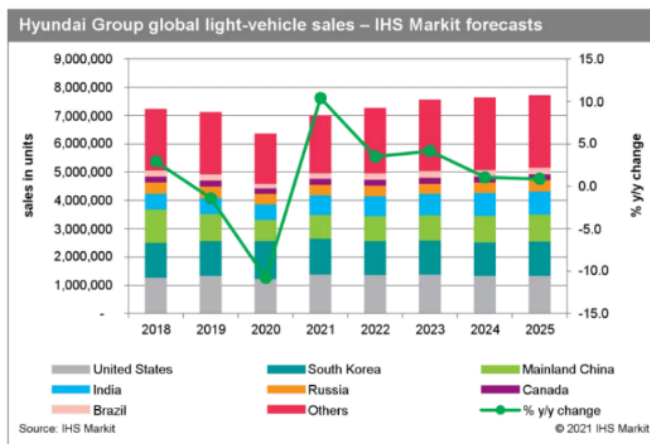
The group is also speeding up development of the UAM product line-up, which encompasses both the passenger and cargo transportation markets. It aims to introduce an Unmanned Aircraft System (UAS) for cargo with hybrid powertrains in 2026, and a fully electrified UAM model optimised for urban operations in 2028, followed by regional air mobility products connecting adjacent cities in the 2030s.

In the field of robotics, the group recently signed a deal to acquire a controlling stake in Boston Dynamics to actively respond to the global "megatrends" of ageing societies and digital transformation as it seeks to provide humanity with a higher level of experience and more value. Hyundai Motor Group's wearable robot technology and its industrial and logistics automation technology are expected to maximise synergies with Boston Dynamics' innovative capabilities. Robotics technology will also be applied to various mobility areas such as autonomous driving, UAM, and purpose-built vehicles (PBVs) to help the group establish a leading position.



Outlook and implications

Hyundai Motor Group depends on overseas markets for nearly 85% of its global sales volumes but is facing severe pressure in these markets largely because of weak demand caused by a contraction in consumer spending and the sluggish global economy amid the COVID-19 virus pandemic. It suspended operations at several plants globally in 2020 following government directives to prevent the spread of the virus. The automotive group also scaled back or suspended operations at various plants across the globe to keep inventories at manageable levels. These offset gains in its domestic market, where it benefited from encouraging demand for new models, attractive sales promotions, and consumption tax relief on passenger vehicles. In an attempt to boost vehicle sales, the South Korean government reduced consumption tax on purchases of passenger vehicles to 3.5%, from the previous 5%, between March and June 2020. At the end of June, the government extended the temporary cut in consumption tax on passenger vehicles by another six months, until the end of December 2020. South Korean consumers received a maximum KRW1.43-million price cut when buying a new car up to the end of last year.



Looking ahead, Hyundai and Kia aim to sell around 7.08 million vehicles globally in 2021, more than the 6.35 million units they sold during 2020. This year's target represents growth of 11.5% y/y. The two automakers expect to register a 4.8% y/y decline in sales in their domestic market to 1.28 million units, while in overseas markets they are forecasting a 15.9% y/y surge to 5.80 million units. With competition in global automotive markets becoming fiercer this year amid recovering vehicle demand worldwide, the Hyundai brand is aiming to sell 4.16 million units (up 11.1% y/y), with optimised business strategies for each region. This is split between a 5.9% y/y decline in the domestic market to 741,500 units and a 15.7% y/y jump in overseas markets to 3.42 million units. Kia, which is preparing for a brand transformation in 2021 based on its "Plan S" business strategy, is aiming to sell 2.92 million units (up 12.1% y/y) in global markets this year. This target is divided into domestic sales of 535,000 units (down 3.1% y/y) and overseas sales of 2.39 million units (up 16.2% y/y). The automaker is also seeking to bolster profitability with flexible operations tailored to each region.

IHS Markit projects that Hyundai Motor Group's global light-vehicle sales – including the Hyundai, Kia, and Genesis brands – will reach 7.02 million units in 2021, up 10.4% y/y from an estimated 6.36 million units in 2020. We expect Hyundai to post sales of 3.99 million units (up 11.5% y/y) globally this year, while Kia's sales are forecast to increase by 6.7% y/y to 2.83 million units. The Genesis brand is expected to sell around 198,900 units (up 57.3% y/y) in 2021. Our light-vehicle forecast includes only passenger vehicles and light commercial vehicles.



[Sales Highlights] BYD reports sales decline of 7.5% y/y in 2020



Chinese automaker BYD has reported a sales decline of 7.5% year on year (y/y) to 426,972 units during 2020. According to a company statement, sales of BYD's new energy vehicles (NEVs), including battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs), contracted by 17.4% y/y to 189,689 units in 2020. Meanwhile, sales of BYD's traditionally fuelled vehicles rose by 2.3% y/y to 27,481 units. Passenger BEVs remained the top-selling category in the automaker's NEV line-up, reaching 130,970 units in 2020, down 11.02% y/y, while sales of its PHEVs fell by 33.4% y/y to 48,084 units. Despite the contraction in its full-year 2020 sales, BYD experienced strong sales growth in the final month of 2020. In December 2020, BYD's sales increased by 30.4% y/y to 56,322 units. Of this total for December, NEV sales surged by 120.2% y/y to 28,841 units, while traditionally fuelled vehicle sales fell by 8.6% y/y to 27,481 units.

Outlook and implications

BYD witnessed a moderate 7.5% sales decline during 2020. Much of this decline was due to sluggish demand for its vehicles, particularly NEVs in the first two quarters. During 2020, BYD introduced several new models, including model variants, to the market. There has been growing demand for the Han EV, for instance, from customers looking for a performance-oriented full-size electric saloon. The Han EV, launched in the second half of 2020, offers electric and plug-in hybrid versions. The model also features BYD's latest battery technologies that enable up to 600 km of driving range under the NEDC test cycle. BYD also introduced a new model variant, the Song Plus, last year, further expanding its sport utility vehicle (SUV) line-up under the Song nameplate. The Song Plus, a mid-size SUV, has stretched BYD's Song model line to attract consumers looking for an SUV with richer technology content and better handling and driving experience than the Song Pro. The same strategy will be applied to the Qin saloon model line, with a new model badged as Qin Plus this year to bolster BYD's sales in the family saloon market. IHS Markit expects BYD's sales volumes to continue to grow during 2021 and 2022. The automaker's sales in China are forecast to reach more than 540,000 units in 2022, hitting a five-year high since 2018.



[Sales Highlights] Global auto sales, production to gain momentum in 2021, according to IHS Markit

IHS Markit perspective

Implications	As we exit 2020 and begin 2021, IHS Markit offers this look at the decline of 2020 and prospects for improvement in 2021. Although there remain headwinds, the year is closing with approvals of multiple COVID-19 vaccines in various countries, as well as a trade deal framework for the UK exit from the European Union. The vaccines and elimination of the threat of a no-deal Brexit are positive signals. Although the decline in global sales and production was not as dire as expected in the April–May 2020 timeframe, the declines in the second quarter of 2020 were far more severe than the 8% decline over the two-year 2008 to 2009 recession.
Outlook	IHS Markit forecasts a 9% y/y gain in global auto sales and a 14% y/y improvement in production in 2021, compared to the pandemic-induced declines in 2020. IHS Markit's economics team estimates global real GDP dropped 4.0% y/y in 2020, with a recovery in 2021 expected to lead to growth of 4.5% y/y. However, IHS Markit forecasts that it will take until 2023 to reach the level of 2019 again (89.7 million units), as growth in 2022 and 2023 (5% and 4% respectively) slow from 2021 improvements.

As we exit 2020 and begin 2021, IHS Markit offers this look at the decline of 2020 and prospects for improvement in 2021. On a global level, uncertainty remains high because of stubbornly high coronavirus disease 2019 (COVID-19) case counts, although vaccines are arriving. Headwinds remain, but the year is closing with approvals of multiple COVID-19 vaccines in various countries, as well as a trade deal framework for the UK's exit from the European Union. The vaccines and elimination of the threat of a no-deal Brexit are positive signals.

However, looking back, full year global 2020 sales and production are both expected to be down 16% year on year (y/y). IHS Markit remains cautious on recovery prospects, with key markets likely to experience differing demand cycles. Some markets face further fallout from the pandemic, not least due to additional virus-control restrictions for the winter months. On a brighter note, for an industry that had traditionally been dependent upon in-person showroom traffic since its inception, online sales and contactless delivery programmes have been swiftly rolled out and are helping to offset the impact of restrictions on registrations as well as moving the industry more quickly to changing its standard operating procedures.

For global production in 2021, IHS Markit expects restocking to provide a positive in many markets, although high COVID-19 numbers mean the risk of more lockdowns is not eliminated. Production disruption in the first months of the year has kept inventory low, which has helped OEMs support higher pricing; although volume has reduced revenues, higher pricing has helped to offset the impact on earnings. Along with automakers, dealers are learning to operate with lower in-stock inventory levels than have traditionally been the case. Particularly in the US, reports are that this is leading to more profitable dealers. There have been changes to the inventory and sales process which may prove to stick with the industry after the virus is gone.





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For 2021, we are optimistic despite headwinds and that the pandemic still has a grip on the world and its economies. “Global 2021 auto recovery prospects very much depend on the path of the pandemic, especially whether governments can deliver on vaccine programmes. Many parts of the world face a winter of stubbornly high COVID-19 infection rates and ongoing restrictions, which could further dent demand prospects. The hope is that demand begins to normalize from mid-year 2021,” said Colin Couchman, executive director for global light-vehicle forecasting at IHS Markit.

Regional sales outlooks influenced by virus resurgences, restrictions, and economic support

European recovery prospects are mixed, with worrying virus resurgences and ongoing restrictions, varied economic support, the Brexit negotiations and fears for a post-holiday third wave of the virus, as well as emergence of a new, more easily transmissible strain. Although hard Brexit concerns were resolved with the announcement of a deal framework in late December, there remain details to be worked out and the final agreement was not available at time of writing. Total Western and Central European automotive sales estimates for 2020 are set at 13.7 million units, down 24.2% y/y, according to IHS Markit. Government auto stimulus programmes from mid-2020 continue to help, especially for the four major European markets. The cautious December roll-out of the vaccine in the UK, as well as approval for vaccines from two other suppliers, provided some hope in the gloomy midwinter ahead of the new year. For 2021, IHS Markit sees demand growth at 11% y/y, to 15.3 million units for 2021. “European car consumers are firmly in full “wait-and-see” mode to see how COVID-19, EVs and Brexit pan out,” said Couchman.



The sequential rise in **US** auto demand levels from the April 2020 low reflects that consumers that were willing, ready and able to purchase a new vehicle did so. Although the pace of growth for auto sales flattened out after September, IHS Markit expects continued growth in auto demand levels in 2021, supported by sustained economic development from better-than-expected news on vaccines and economic stimulus approved at the end of December 2020. “Looking at 2021, US sales volumes are expected to reach 16 million units, up an estimated 10% from the projected 2020 level of approximately 14.5 million units. The pace of sales is anticipated to be stronger in the second half of the year, following increasing availability of the vaccine by summer,” according to Chris Hopson, principal automotive analyst at IHS Markit.

There were shades of “first in, first out” for **Mainland China**, as effective pandemic containment has enabled an ongoing auto demand recovery, with 2020 set to deliver 23.6 million units, down by just 5% y/y. Bright spots include premium demand and the light commercial vehicle (LCV) sector. Government support includes revised new-energy vehicle (NEV) rules, a six-month delay to the China 6 emissions deadline, city de-restrictions, licence plate quota increases, and revised lending rules. In 2021, IHS Markit expects the market in China to recover further to 24.9 million units (up 5.6% y/y).

Production expected to rebound in 2021

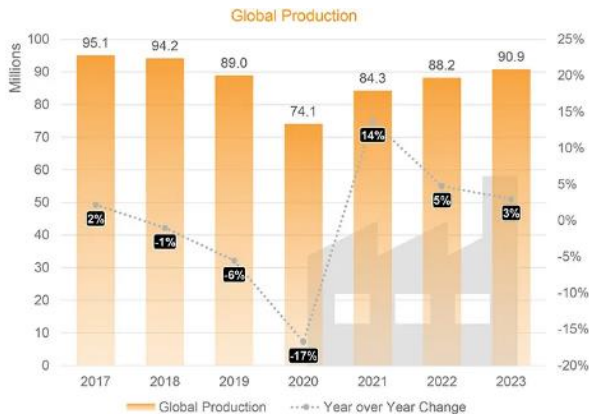


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Global light-vehicle production in 2020 is expected to finish at 74.1 million units, a 17% y/y decline. For 2021, IHS Markit forecasts a rebound in light-vehicle production of 14% y/y to 84.3 million units, based on current analysis. This reflects continued recoveries, particularly in the major markets of China, Europe and North America. Manufacturing operations in most regions are largely restored and while COVID-19 secure practices will affect technical capacity, in most cases there is enough to support recovery.



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In **mainland China**, manufacturing activity is reaching pre-COVID-19 levels, and IHS Markit forecasts 2021 output to rise 5.6% y/y and surpass 2019's admittedly weakened levels. Threats to the supply chain remain, but to date these have been successfully navigated since the restart in March.

For **North America**, the recovery profile continues but there are some unique challenges. In the short term as 2020 concludes, there is concern over potential supply disruption as a direct result of COVID-19 absenteeism and IHS Markit has a cautious view for the first quarter of 2021 in light of this. The balance of the year is expected to show a production increase of 29% y/y in the US, boosted by efforts to close the inventory gap that opened up in the second quarter of 2020 when manufacturing was offline. With demand levels expected to remain healthy, this effect is forecast to run across the next 12 months. As we noted earlier, however, the lean inventory situation is also leading to shifts in dealer processes and the realisation of more profitable sales with less in-stock inventory. Although work toward closing the inventory gap is still needed, we may see some change in what will define a normal inventory level.

Europe is expected to recover in 2021, gaining 15% y/y, but it is a fragile road with more obvious risk to the outlook than China or North America. Having navigated a series of second-wave lockdowns in November, more stringent measures are now being adopted in Germany and much of the UK. At present, this is not posing a direct risk to manufacturing. Although in late December, the EU and the UK came to agreement regarding new trade rules and the Brexit transition, there are details still to be negotiated and the full scope of the agreement is not available. Among outstanding issues are those surrounding customs procedures and regulatory co-operation; although a no-deal Brexit has been avoided, it remains a complicated situation with short-term uncertainty. The impact on production will be incorporated into the forecast in the coming months. The situation is more hopeful than prior to the agreement. Mark Fulthorpe, executive director for light-vehicle production forecasts at IHS Markit, said, "A 'no-deal' outcome would dramatically disrupt sales and production levels. Initially the hit to sales would be felt hardest in the UK market, while production facilities in Germany, Spain and Czechia supplying the UK market would be most exposed to this decline." This appears to have been averted, however.



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In addition to the risks posed by the pandemic and the Brexit transition period, the region also faces the introduction of a new corporate fleet average for CO2 emissions and balancing the vehicle mix is likely to be a constraint.

Outlook and implications

IHS Markit forecasts a 9% y/y gain in global auto sales and a 14% y/y improvement in production in 2021, compared to COVID-19 virus pandemic-induced declines of 16% and 17% respectively in 2020. The forecast assumes effective COVID-19 vaccines are available widely by mid-2021, although full availability is not expected until 2022. IHS Markit's Economics team estimates global real GDP dropped 4.0% y/y in 2020, with a recovery in 2021 expected to lead to growth of 4.5% y/y. However, IHS Markit forecasts that it will take until 2023 to reach the light-vehicle sales level of 2019 again (89.7 million units), as growth in 2022 and 2023 (5% and 4% respectively) slow from 2021 improvements.

IHS Markit estimates the real GDP decline was the worst since 1946, creating a global recession which will affect economies across the forecast horizon. Of particular concern for the automotive sector is potential for a bounce-and-fade scenario, where growth fades after an initial bounce. Production and sales dropped at nearly twice the rate witnessed during the recession in March and April 2020, although consumers in many markets able to purchase new vehicles began doing so relatively quickly and the full-year declines were far less stark than the situation indicated in May 2020. Growth is expected in 2021, although the second half of the year largely is due to be stronger than the first half – and the year's progression remains in many ways tied to controlling the pandemic and the wide availability of a vaccine. Once vaccines are rolled out and available and COVID-19 infections are managed, conditions can begin to return to a real normal; although IHS Markit also expects that economic scarring from the crisis will linger; we expect that consumers may rethink life and social imperatives may have changed. As the IHS Markit sales and production forecasting teams discussed in the December webinar (clients can access the replay of the 15 December 2020 event at this link), in terms of risks to our forecasts, we see upside in potential for these early vaccines to be effective and fast-tracked for swift roll out, which could contribute to a V-shaped recovery that takes hold earlier with jobs and consumer optimism. Auto incentives could be extended and demand boosted by buyers looking for private transportation, “bio-safe” buyers. However, among the downside risks could be a W-shaped recovery, triggered by another wave of the virus and more aggressive lockdowns than even in the final two months of 2020. This could be driven by vaccine delays or a lack of effective treatment. In that scenario, we could see a fade in growth after an initial bounce in 2021.



[Technology and Mobility Highlights] NavInfo partners with Inceptio to develop HD map for autonomous trucks

NavInfo has partnered with Inceptio Technology to provide its high-definition (HD) map for the development of autonomous trucks, which will go into volume production at the end of 2021. Under this partnership, NavInfo will supply its one-stop mapping service, OneMap, to Inceptio for the latter to build a fleet of autonomous trucks deployed for logistics business, reports Gasgoo.



Outlook and implications

NavInfo is a navigation map service provider to global automakers including SAIC, BMW, Volkswagen Group, General Motors, Volvo, Toyota, and Nissan. In 2019, Beijing's municipal authority has issued a temporary licence plate for the testing of autonomous vehicles to NavInfo. Inceptio focuses on developing Level 3 and Level 4 autonomous truck technologies and has partnerships with truck makers such as Dongfeng Automobile, Sinotruk Hong Kong, and Foton. Recently, the company has secured a USD120-million investment in a funding round led by Chinese electric vehicle battery maker CATL.

[Technology and Mobility Highlights] Dongfeng Motor partners with Aurora Mobile to strengthen AI-based smart mobility services

Dongfeng Motor has partnered with Aurora Mobile to strengthen artificial intelligence (AI)-based smart mobility services. This partnership will enable Dongfeng Motor's one-stop mobility service platform, DFGO, to enhance operational and service efficiency and optimise user experience. Aurora Mobile will use its AI-based push notification services and machine learning-based operational analysis capabilities to enable DFGO to gain insights into user needs and improve user experience.





Outlook and implications

DFGO currently offers services including online ride-hailing, premium car hailing, timeshare car leasing, taxi-hailing, used-car transaction services and electric vehicle (EV) charging. In future, DFGO plans to upgrade its products and technologies by connecting its platform with urban transportation systems and expanding its service coverage to bike sharing, bus services, hitch riding and intercity vehicle services. Last year, Dongfeng partnered with Chinese technology company Tencent to jointly deploy smart mobility services. It has also partnered with FAW Group and Chongqing Changan to form a venture named T3 Mobile Travel Services to establish a ride-sharing platform.

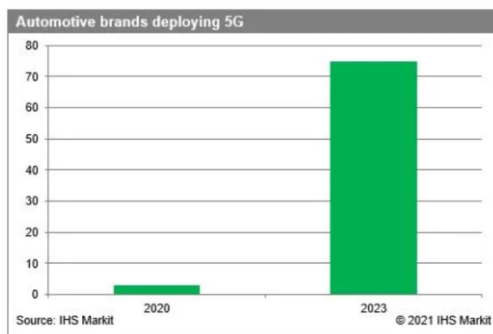
[Technology and Mobility Highlights] 5G, C-V2X, and automotive connectivity in 2021



See why the recent FCC decision to hit the accelerator on C-V2X and slam the brakes on DSRC could mean big things for 5G and what the auto industry should watch for moving forward.

Ads touting the benefits of 5G are everywhere these days. But if you're not thinking about the potential value that 5G brings to the auto industry, you should be. In late 2020, the FCC voted to reallocate 75 MHz of spectrum that had previously been allocated for Dedicated Short-Range Communications (DSRC) services. For years, DSRC was viewed as a key to unlocking vehicle-to-vehicle use cases and increasing safety features. But the FCC's decision means slamming the brakes on DSRC and hitting the accelerator on Cellular V2X (C-V2X) instead.

In many ways, the FCC ruling maps to the growing importance of connectivity across other areas of our lives and communities. From IoT applications to the promise of smart cities (and smart vehicles!) to simply being able to stream entertainment whenever we want to and wherever we are, connectivity is becoming a piece of daily infrastructure as important as having good roads and highways. 2020 saw the very first vehicles hit the road with 5G network capability, with more than 70 brands supporting 5G by 2023.



For auto manufacturers, this increase in dependence of connectivity brings both benefits and new potential risks. First the benefits: 5G promises to bring greater capacity, vastly improved speeds, and much lower latency/lag. In the context of C-V2X applications, this will translate into increased infotainment options, the capacity to handle more and more cars talking to one another simultaneously, and improved safety features, all without the fear of congestion or interruptions in service. Indeed, the benefits of 5G make it a key cornerstone for a future where all cars are constantly in communication with one another, with pedestrians, and even with city and road infrastructure.

On the other hand, as dependence on and expectations for connectivity grow, any interruption in service becomes more and more problematic. And, like it or not, when connectivity fails, users are likely to blame the car more than the cellular or connectivity network itself. From this perspective, manufacturers that create the most robust and resilient C-V2X connectivity systems could have an important advantage moving forward.

The FCC decision splits the 75 MHz of DSRC spectrum (5.850–5.925 GHz) into two pieces: the upper 30 MHz will be reserved solely for C-V2X, while the lower 45 MHz is left for unlicensed use.

At RootMetrics (IHS Markit's mobile performance business line), we are constantly testing not only 5G but how the various bands of spectrum perform. The good news is that this band of 5.9 GHz spectrum should offer both high speeds and good coverage. We'll be interested, however, in learning whether dedicating only 30 MHz for C-V2X is enough, particularly as our connectivity needs continue to grow.



[Supplier Trends and Highlights] MyScript and Epicn poc team up on automotive multimodal HMI

Companies to present MyScript's software with EPICNPOC's BOWL™ Automotive kit at CES 2021



Source: Getty Images Plus/ metamorworks

MyScript and EPICNPOC have signed a memorandum of understanding (MOU) to collaborate on multimodal human machine interface (HMI), EPICNPOC said in a press release on 5 January 2021. The collaboration will see the integration of handwriting input with voice, audio, visual, and lighting. MyScript's technology will be integrated into EPICNPOC's software platform and offered through product and service solutions.

The companies will announce their collaboration in the automotive domain at CES 2021, with the integration of MyScript's software into EPICNPOC's BOWL™ Automotive kit. The kit allows users to design, develop, validate, and test new in-vehicle experiences.

"The integration of MyScript's handwriting-recognition technology with EPICNPOC BOWL™ Automotive shows how handwriting input can dramatically improve the user experience in real-life use cases. Searching for a contact, a song or a destination becomes more natural and intuitive, improving safety as the driver is able to keep their eyes on the road. With support for 72 languages, MyScript's technology is ready to address the needs of users worldwide—for automotive use cases and beyond," said Olivier Cros, director, head of Automotive at MyScript.

Outlook and implications

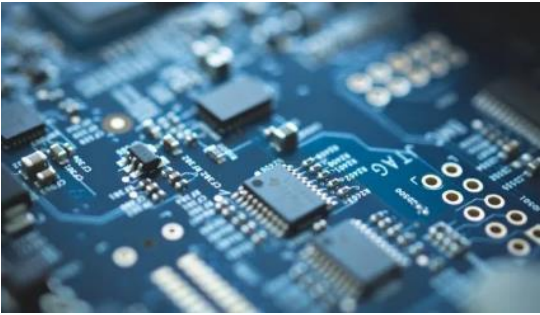
The integration of MyScript's handwriting-input framework with EPICNPOC's open distributed-system modelling and service-oriented architecture allows companies to easily create smart products with multimodal and multi-display interactions. This will make safer and smarter interactions possible in many application domains including automotive, mobility, home intelligence, industry 4.0, and education.

BOWL™ Automotive is now available with handwriting on a smart surface, combined with an extensible set of 4 displays, user recognition, individual audio, voice interaction, lighting, and powered seats. This allows automakers to bring a keyboard functionality to any touch surface while ensuring that consumers keep their eyes on the road.



[Supplier Trends and Highlights] EasyMile, Kalray strengthen partnership to develop intelligent system

The companies are already collaborating on the ES3CAP project that aims to build a hardware and software platform



Source: Getty Images/Wiyada Arunwaikit

EasyMile has strengthened its partnership with Kalray by signing a Memorandum of Understanding (MOU) to jointly develop intelligent systems, the two companies said in a press release on 6 January. Two companies are already collaborating on the ES3CAP project. The 10-member project, announced in 2019, and with a budget of EUR22.2 million (USD27.3 million) for three years, aims to build a hardware and software platform for developing critical applications requiring high-computing capacity in the fields of aeronautics, defense, and autonomous vehicles.

“Safety and performance reliability are key to embedded systems. This collaboration with Kalray, which started with the ES3CAP program, matches the high criteria we expect of our partners and we are delighted to be working with them,” said Benoit Perrin, managing director, EasyMile. For Eric Baissus, CEO of Kalray, the collaboration is “further evidence of the value that our MPPA intelligent processors and SuperECU solution can bring to easily build safe autonomous systems”.

Outlook and implications

EasyMile specializes in autonomous vehicle solutions for first and last mile connectivity. The company’s technology interacts with all kinds of next-generation cameras, radars, and lidar sensors. Autonomous vehicles also require electronic control units (ECUs) capable of running multiple applications in parallel without compromising safety. Kalray offers SuperECU which is capable of providing both the demanding performance required to compute functions such as artificial intelligence (AI) algorithms but also to support multi applications with different level of criticality on the same chip. The ECUs are based on Kalray’s Multi-Purpose Processor Array (MPPA) processor which the company claims ensures complete freedom from interference between these applications, which is a key attribute in building safe systems.



[GSP] Japan/Korea Sales and Production Commentary - 2020.12

Japan/Korea sales

November 2020: +0.3%; 0.54 million units vs. 0.54 million units

YTD 2020: -8.4%; 5.81 million units vs. 6.34 million units

- Japanese light vehicle sales increased 7.1% year on year (y/y) in November 2020. The November increase in sales was owing to the recovery trend in the macroeconomic environment. In addition, there was a rush in demand for new vehicles toward September 2019 as the value-added tax (VAT) increase was scheduled for implementation in October 2019; therefore, the spike in sales was partly owing to a statistical factor with a lower base comparison in October and November 2019 versus the same periods in 2020. Accordingly, this statistical uptick trend might continue for the coming months as well.
- The Japanese near-term economic outlook still shows stagnating momentum, reflecting weak business conditions nationwide in the past several months since the COVID-19 pandemic started earlier in 2020. However, the situation shows slightly better-than-expected momentum as some affluent families can afford durable goods such as cars, instead of actively going abroad. The Tokyo 2020 Olympics and Paralympic Games were already postponed to summer 2021 owing to COVID-19. The market for new vehicles in Japan started its decline in October 2019, when the VAT hike was implemented in the same month.



- Japan is in recession and owing to the effects of the COVID-19 virus, the Japanese market's overall domestic sales forecast in 2020 is set at 4.52 million units. This figure is projected to decrease 11.2% compared with 2019.
- South Korea's total light vehicle sales were forecast to fall in November 2020, during the COVID-19 pandemic and the trade friction overseas situation. The upcoming months' better sales performance can be expected owing to the year-end aggressive sales promotions and growth in the import sector market with the consumption tax relief on passenger vehicles.
- Sales of imported vehicles increased 7.5% y/y in November. Nevertheless, reflecting on the recent situation in South Korea, Nissan has decided to exit the market by the end of 2020, but it will continue to offer aftersales services for existing customers of Nissan and Infiniti models through 2028.



- The COVID-19 virus outbreak and the trade friction overseas will take a toll on the South Korean economy; however, the government's effort to support and stimulate domestic demand via temporary consumption tax relief on passenger vehicles seems to be working. Therefore, the country's sales of new vehicles in 2020 are expected to increase 7% compared with 2019 to 1.87 million units.

Japan/Korea production

November 2020: 4.2%; 1.13 million units vs. 1.09 million units

YTD 2020: -16.8%; 9.13 million units vs. 10.97 million units

- In terms of forecast variance volume from the last forecast, for Japan, there were no major changes for 2020 compared to the last forecast. However, full-year 2021 and 2022 production volumes were upgraded by an average 0.9% largely owing to increasing domestic demand in addition to a new sourcing of the Toyota Corolla Cross to Europe. Long-term volume was also upgraded by 1.3% per year mainly owing to additional sourcing of the Toyota Corolla Cross and the Nissan Kicks to Europe, while the Mazda CX-3 and Mazda 2 dropped from Japan production. We expect Mazda will be unable to secure enough resources to develop B-segment models to newly develop a dedicated battery electric vehicle (BEV) platform.

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