



Automotive Industry Weekly Digest

05 Apr – 09 Apr 2021





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[OEM Highlights] VW brand reports profitable 2020, positioning for long transition to software-defined products

IHS Markit perspective

Implications	Volkswagen (VW) brand hosted its annual press conference this week, discussing its financial performance in 2020 and outlining its efforts on digitalisation and on laying the groundwork for a transition to creating vehicles as software-defined products.
Outlook	The VW brand's press conference echoed the discussion of planned moves at the corresponding VW Group event, with a description of specific implications for the brand, and the brand provided an outlook for 2021. The VW brand weathered 2020 relatively well and it seems well positioned in 2021.

Volkswagen (VW) brand hosted its annual press conference this week, discussing its financial performance in 2020 and outlining its efforts on digitalisation and on laying the groundwork for a transition to creating vehicles as software-defined products.

In 2020, VW's sales revenues dropped to EUR71.1 billion (USD84.5 billion), from EUR88.4 billion in 2019. VW brand's chief financial officer Alexander Seitz provided an overview of the brand's performance in 2020 and an insight into its expectations for 2021, from a financial perspective. As with all nearly all other automakers, the coronavirus disease 2019 (COVID-19) pandemic created significant disruption and caused lost production and sales last year. In 2020, VW brand's unit sales were about 2.8 million units, a drop of 23%, Seitz said. However, VW was also able to keep its market shares stable in most areas. In addition, the brand's revenue decline was somewhat softened by mix- and price-related factors, and the drop was 20%. In 2020, VW brand's operating profit was positive but was only EUR453 million. As with most other automakers, the worst quarter in 2020 was the second quarter and the improvements in the third and fourth quarters were better than had been expected in March 2020. VW brand made a loss of nearly EUR2 billion in the second quarter. The brand then put aggressive cost measures in place as well as a focus on costs and measures relating to plant management and inventory control. By the third quarter, the brand's financial results were stable and, in the fourth quarter, VW returned an operating profit of EUR1.4 billion, as a result of both the market recovery and the company's internal measures.

VW brand reported an operating profit of EUR3.8 billion in 2019, which dropped to EUR453 million in 2020, excluding special items. The EUR3.3 billion decline in operating profit from 2019 to 2020 included a negative EUR4.5 billion impact from lower sales volume – the brand sold 840,000 fewer vehicles in 2020 than in 2019 – and a negative impact from exchange rates, partly offset by improved pricing. Product costs related to emissions compliance had a EUR0.4 billion impact. In addition, reductions in fixed costs improved operating profit by EUR1.7 billion, including a one-time, one-off effect of EUR0.6 billion resulting from carving the Car.Software Organization from the VW brand and moving it to VW Group, where it will support all group brands. VW also reported EUR0.1 billion in restructuring costs related to Volkswagen do Brasil. Seitz said the actions in Brazil were expected to mean it would break even in the region in 2021.



VW brand reduced its fixed costs by about EUR1 billion in 2020 by freezing its headcount, postponing or cancelling some investment projects, zero-based budgeting, and optimisation of marketing spend. However, VW's research-and-development (R&D) spending remained in its strategic target range of between 3% and 4%. In 2020, total R&D costs were EUR2.7 billion, 3.9% of sales revenue. Moving the Car.Software Organization to VW Group reallocated about EUR600 million in R&D expenses to the parent; as VW Group is deploying Car.Software across all group brands, the shift creates synergies in software development and provides a "joint backbone". VW brand's capital expenditure (capex) remained strong despite the pandemic. VW's strategic target range for capex is between 4% and 5% of sales revenue; in 2020, capex was at 4.8% of sales revenue, with the brand investing EUR3.4 billion in 2020, down from EUR800 million in 2019. The brand cancelled or postponed "business critical" investments in favour of investments that moved VW forward towards its planned future on software and electric vehicles (EVs). The brand's operating cash flow was at about breakeven point at the end of last year, with a positive performance of EUR3.8 billion in the second half making up for the drain in the first half.

VW brand continues to target a 6% operating return on sales in 2023, with Seitze noting four key levers supporting the effort. VW is working toward a reduction in fixed costs of 5% by 2023, stating that actions in 2020 demonstrated the potential for achieving this. VW also targets increasing productivity at plants by 5% annually and lowering material costs by 7% by 2023. Although VW expects to break even in the United States and South America in 2021, markets in which it has made losses in recent years, Seitze says reaching the company's targets will also include reaching clearly positive net incomes in all regions, not simply breaking even. In addition, VW expects that exploiting economies of scale with the MQB and MEB platforms will help improve its profitability; 80% of VW Group's sales volume will leverage those two platforms, creating significant scale. VW also expects to see new sources of revenue as a result of new connectivity technology, while the Trinity project is expected to reduce vehicle complexity.

Software-defined products and new revenue streams

VW brand CEO Ralf Brandstatter has called 2020 the breakthrough for the brand relative to its EV offensive, with the initial success of the ID.3. The new Golf uses a new electrical architecture while the E3 software architecture of the ID family is ready for over-the-air updates and "raises digitalization to the next level". Brandstatter said that VW's delivery of 212,000 electrified vehicles in 2020, including 134,000 all-electric vehicles, was three times the number of the prior year. Perhaps a bit optimistically, Brandstatter said that the results meant "Electric mobility is now normality." Brandstatter expects the brand's electrified vehicle sales to reach about 450,000 units in 2021.

As VW moves forward, Brandstatter says that the three major forces driving the future development of vehicles are software-defined products, new business models, and autonomous driving. He said, "Only companies that are technologically proficient in all three will have a chance in the future. Volkswagen's mission is to be the leader in the new world of mobility as well." Although the outline of VW's ambitions were outlined with the announcement of its Accelerate programme in early March, Brandstatter discussed a paradigm shift for VW at the annual press



conference. Instead of thinking in terms of components and parts, VW's development will focus on functions and systems, putting the "digital user" at the centre, he said.



With the new data-driven business model focus of Accelerate, VW is looking to generate additional revenues with high margins over the service life of vehicles – to the level of revenues in "three-digit million" range by 2025, and scaling up the offerings by many millions by 2030, creating a new and profitable source of revenue. At the core of the model is that over-the-air updates enable the company to turn features on or off in vehicles with a software update. Instead of a model in which a vehicle has certain features at its delivery, customers could, for example, order the heated-seat function to be turned on or off afterwards, or buy navigation services for a specific trip, to be discontinued on return from the trip.

As VW explores the potential of this new software-based revenue model, in the second half of 2021, the brand is launching a pilot project with the ID.3 in six German cities. The pilot programme will enable the brand to assess customer reactions and preferences for subscription models, pay-per-mile billing, and additional on-demand functions and features such as charging a flat rate for navigation services that can be booked when needed. About 1,000 customers will participate in the pilot programme. In addition, VW is also becoming more active on online sales, with Germany the first country where it offers online sales in 2021. However, dealers will remain part of the process, Brandstatter stated. VW started piloting its digital sales platform in the third quarter of 2020. By mid-2021, the entire purchasing process, including financing, of the ID family vehicles is to be online in some markets.

Outlook and implications

The VW brand's press conference echoed the discussion of planned moves at the corresponding VW Group event, with a description of specific implications for the brand, and the brand provided an outlook for 2021. The VW brand weathered 2020 relatively well and it seems well positioned in 2021. Although VW is laying the groundwork for a shift to software services and is assessing customers' reactions, the company needs to ensure its traditional vehicle sales continue, as the revenue is necessary to fund technology development. Although the VW Group press conference earlier in the week addressed the company's overall position on elements such as autonomous driving, the VW brand's presentation provided more detail on the immediate-term plans, and worked to reinforce that the company is well positioned for the years-long transition period it faces to become the "most attractive brand for sustainable mobility."

VW brand provided an outlook for its results in 2021 as well, with some metrics discussed in general terms. The company said that its sales revenue would be significantly higher than the 2020 levels. The brand said it was focused on achieving an operating return on sales of between 3% and 4%, a capex ratio of between 4% and 5%, and an R&D ratio of between 3% and 4%. However, VW expects its operating return on sales to grow to 6% and then to over 6% in 2025. Over that timeframe, the capex and R&D ratios would be held to the same target as in 2021, it said. By 2023, VW expects to have a free cash flow of between EUR1 billion and EUR2 billion, and the



level to be firmly above EUR2 billion in 2025. VW also identified two key risk areas. First, Seitze noted that the success of measures to control the COVID-19 pandemic in main sales markets would be “of decisive importance”. Second, he noted that the semiconductor shortage could have an impact on results in 2021.

[OEM Highlights] BMW Group to expand its presence in South Korea

BMW Group plans to introduce 10 new vehicles in South Korea this year, including electric vehicles (EVs) and new Mini models, reports The Korea Herald. The automaker will also expand its facilities in the country, adding new service centres and showrooms and expanding its existing logistics centre to improve customer satisfaction. In its first launch this year, the automaker in February rolled out the second-generation BMW 4-Series. During the second quarter of 2021, it will be launching its high-performance sports models – the M3 Competition and M4 Competition Coupé. It will also launch the M135i, the performance-oriented model among its 1-Series line-up. A series of new EVs, including the flagship EV BMW iX and iX3, are scheduled for release in the fourth quarter of 2021. The automaker will also launch the new 2-Series Coupé in the fourth quarter. Under the Mini brand, BMW Group Korea will introduce the Mini 3-door hatch, Mini 5-door hatch, and a facelifted version of the Mini Convertible, all in the third quarter of this year. The German automaker will offer limited-edition vehicles in the country as well this year. It is also increasing its investment in South Korea. Earlier this year, it announced that it will invest KRW60 billion (USD53.1 million) through to 2023 to expand its logistics centre in Pyeongtaek to accommodate up to 18,000 vehicles from the current 11,000 vehicles. This expansion will increase its pre-delivery inspection capability from the current 78,000 units to about 120,000 units. BMW Group Korea is also working to add nine new service centres and three more showrooms for the BMW brand in South Korea this year. With this, the automaker will have a total of 77 service centres and 60 showrooms across the country. The expansion is expected to create 500 new jobs.



Outlook and implications

By introducing new models and investing in South Korea, BMW Group aims to strengthen its foothold in the country, where demand for overseas premium vehicles is growing. The automotive group faces stiff competition from its arch-rivals Mercedes-Benz and Volkswagen Group. BMW is currently the second most popular imported car brand in South Korea. According to data released by the Korea Automobile Importers and Distributors Association (KAIDA), BMW-brand sales in South Korea grew by 32.1% year on year (y/y) in 2020 to 58,393 units. IHS Markit expects that BMW-brand sales in the country will grow by 6.2% y/y in 2021 to around 62,000 units.



[Sales Highlights] Toyota Group reports 4.6% y/y increase in global production during February

IHS Markit perspective

Implications	The increase in overseas production can be attributed to a low base of comparison, while domestic production was affected by the earthquake that hit the coast of Fukushima Prefecture at the beginning of February. The earthquake resulted in a suspension of production at multiple plants during the month by Toyota.
Outlook	According to IHS Markit's latest production forecasts, Toyota Group's light-vehicle production (including the Hino, Daihatsu, Toyota, and Lexus brands) is expected to reach around 10.334 million units in 2021. At its Japanese plants, total light-vehicle production during 2021 is expected to be around 4.054 million units.

Toyota Group has announced its global production figures for February, reporting a 4.6% year-on-year (y/y) increase in overall output to 797,571 units. This figure includes output at its subsidiaries Daihatsu and Hino. According to data released by the automaker on its website, worldwide output of the Toyota brand was up by 6.8% y/y to 668,001 units last month. Daihatsu's output was down by 4.9% y/y to 117,461 units and Hino's production declined by 10.2% y/y to 12,109 units. By region, Toyota Group's production decreased by 6.0% y/y in its domestic market to 339,628 units in February and improved by 14.0% y/y in overseas markets to 457,943 units. Japanese output of the Toyota brand was down by 7.5% y/y to 244,048 units, Daihatsu's domestic production was down by 1.2% y/y to 85,678 units, and Hino's output was down by 6.7% y/y to 9,902 units. In overseas markets, production of Toyota-brand models during February was up by 17.1% y/y to 423,953 units, while Daihatsu posted a 13.7% y/y decline to 31,783 units. Hino's output shrunk by 23.1% y/y to 2,207 units.



On a year-to-date (YTD) basis, Toyota Group's global production was up by 3.2% y/y to 1.661 million units. The Toyota brand's output was up by 5.3% y/y to 1.409 million units, Daihatsu's production was down by 6.8% y/y to 227,893 million units, and Hino's production fell by 11.9% y/y to 24,242 units. By region, total production in Japan during the first two months declined by 5.7% y/y to 670,153 units, while production outside Japan was up by 10.2% y/y to 991,687 units.

Outlook and implications

Toyota Group's overseas production increased for the sixth consecutive month in February, while domestic output was down for the second consecutive month. The increase in overseas production can be attributed to a low base of comparison, while domestic production was affected by the earthquake that hit the coast of Fukushima Prefecture



at the beginning of February. The earthquake resulted in a suspension of production at multiple plants during the month by Toyota. Although the earthquake had no significant impact on Toyota's factories, it did affect some suppliers, causing a delay in parts supply. The extended state of emergency also weighed down on demand and production during the month. In addition, uncertainties over new infections and slow progress in the coronavirus disease 2019 (COVID-19) vaccine rollout kept consumers cautious about going out.

Outside Japan, Toyota-brand (including Lexus) production in North America decreased by 5.7% y/y to 142,233 units. Although there was high demand for the Highlander hybrid electric vehicle (HEV), the cold wave resulted in a suspension of operations at certain plants in the region, thereby affecting production volumes. Production in the United States was down by 13.9% y/y to 83,676 units during the month, while in Mexico it grew by 12.8% y/y to 17,157 units. In Latin America, Toyota-brand production was down by 6.3% y/y to 22,351 units last month. In Europe, Toyota's production was down by 3.5% y/y to 72,312 units in February. France experienced a temporary decrease in production compared with last year owing to a higher base of comparison. Production in Europe was affected owing to low demand due to lockdowns in response to the second wave of the COVID-19 virus pandemic. In China, Toyota's output was up by 484.5% y/y during February to 89,488 units because of a low base of comparison.

It appears likely that the coming months will be equally tough for the industry as drastic global market stagnation and increasing political and economic uncertainties around the world will present downside risks for global production. The automotive industry has been dealing with the issue of semiconductor chip shortage, with automakers around the globe forced to suspend or reduce production as a result. The issue became worse when a fire broke out at Renesas Electronics's factory earlier this month. According to a report, Renesas accounts for 30% of the supply of global microcontroller unit chips used in cars. The fire broke out in one of the clean rooms at the company's plant in Naka city, north of Tokyo (Japan), resulting in production stoppages and burning of about 2% of the facility's manufacturing equipment. About two-thirds of the affected production is reported to be automotive chips. IHS Markit is still working to establish how this new situation will affect vehicle production.

Meanwhile, in an attempt to ease the supply shortage of semiconductors adversely affecting operations in the automotive industry, the Japanese government has asked Taiwan to ramp up production of semiconductors. According to IHS Markit's latest production forecasts, Toyota Group's light-vehicle production (including the Hino, Daihatsu, Toyota, and Lexus brands) is expected to reach around 10.334 million units in 2021. At its Japanese plants, total light-vehicle production during 2021 is expected to be around 4.054 million units.



[Tech Highlights] BorgWarner looking to expand electrification revenues

Telecoms company KT will test 5G-connected autonomous buses at a smart industrial complex in Pangyo, South Korea. The company will deploy two of these buses that use vehicle-to-everything (V2X) technology to communicate with each other and on-road structures such as traffic lights and pedestrian monitoring devices. It also features real-time kinematic (RTK) positioning satellite navigation technology as well as a local dynamic map (LDM) and a geographic information system (GIS). The vehicles are manufactured in partnership with electric vehicle maker Edison Motors and tech firm Phantom AI, reports Aju Business Daily.



Outlook and implications

KT, South Korea's largest telephone company, has plans to build a core telecoms infrastructure, including a 5G wireless network and big data platforms in the country. It also plans to develop 5G-based V2X terminals for South Korea's autonomous vehicle (AV) test bed, K-City. Last year, the company collaborated with the Korea Automotive Technology Institute (Katech) to develop technologies for future cars. The government of South Korea aims to commercialise an AV with Level 4 technology in 2027. Level 4 requires no human intervention, but its applications are limited to specific conditions. The government previously unveiled plans to accelerate the adoption of electric cars, AVs, and flying cars in the coming years – under which South Korean companies will invest KRW60 trillion in future automotive technologies over the next decade.

[Tech Highlights] SAIC partners with Haier to jointly develop intelligent transportation systems

Chinese automaker SAIC Motor has reportedly partnered with appliance giant Haier Group to jointly develop intelligent transportation systems and smart homes. Under this partnership, Haier will invest in a SAIC unit that will be formed to develop autonomous vehicle (AV) technology at Yangshan Port (China). The companies will also co-operate on developing lightweight materials and establish a fund to invest in areas such as intelligent manufacturing, reports Bloomberg.



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Outlook and implications

China is pushing 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 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. SAIC has joined technology partners including Alibaba and Intel in a bid to gain a foothold in the field of AVs. Recently, SAIC Motor announced plans to begin offering automated vehicles in partnership with Luminar Technologies in 2022.



[GSP] India/Pakistan Sales and Production Commentary -2021.03

India/Pakistan sales

February 2021: +14.2%: 353,629 units vs. 309,565 units

YTD 2021: +12.8%: 711,789 units vs. 631,182 units

- The Indian subcontinent's light vehicle sales grew 14.2% in February 2021. Sales in the Indian automotive market in February rose 14.4%, while in Pakistan, light vehicle sales jumped 10%. Sales growth in India and Pakistan was due to a surge in demand. This is as people are avoiding public transportation owing to COVID-19-related fears. The accumulation of savings due to the cut in expenses during the last eight months has boosted consumers' ability to pay the down payment on a vehicle. In a recent review, the Reserve Bank of India (RBI) left the repo rate unchanged, which means the lower interest rates will continue thus alluring customers to purchase a new car. However, price hikes on account of annual inflation and increasing commodity prices will be deterrents to growth.
- In the first half of 2021, sales will likely rebound strongly owing to the very low base last year due to production halts mainly in the second quarter last year. On the macro side, the Indian economic growth forecast is expected to be strong, at around 8.9%, in 2021. Lower interest rates and the tendency to avoid public transportation and instead to use private cars may be the key drivers that will help the industry grow. A possible scrappage scheme would help the industry generate demand and bring the automotive industry back to a fast growth trajectory. In 2021, the market will grow around 28% on a year-on-year basis.



- In Pakistan, automotive sales were up 9% in February 2021 because of pent-up demand and production picking up. The aggressive near-term macroeconomic outlook, lower interest rates, and recovery in businesses and the economy will remain major drivers to growth. There is a possibility of high short-term growth. However, in the medium term, a deterioration of macroeconomics is likely. In the long term, momentum is positive for the car industry, and the government is focused on pushing the automotive industry. Changes in private-sector policies will also help drive sales in the country.

India/Pakistan Production

February 2021: -6.3%; 374,369 units vs. 352,081 units

YTD 2021: 0.0%; 753,322 units vs. 754,000 units



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- The Indian subcontinent's light vehicle production increased 6.3% year on year (y/y) in February 2021, with 374,369 units. Indian light vehicle production in February 2020 recorded 362,887 units, or an increase of approximately 6.6% y/y, mainly owing to the robust sales demand from the Indian market. Maruti, Hyundai, Nissan, Renault, and Tata posted strong growth in February, while Volkswagen (VW), Ford, and Toyota posted declines.
- In 2021, production in the Indian subcontinent should grow 28.1%, with 4.31 million units, while India will likely bounce back to regain its fifth-largest light vehicle production rank from South Korea. The robust sales continued in India and brought low inventory levels to the dealer's end. The waiting period is continuously increasing for consumers. Vehicles such as the Hyundai Creta, Kia Seltos, and Tata Altroz are touching the 3–6 month waiting period. IHS Markit analysts were confident in the recovery in light vehicle production and expected to see growth in at least 10 months out of 12 months—starting in September. However, the global disruption from the semiconductor shortage and a significant increase in input prices result in a cautious outlook on supply and demand.



[Supplier Trends and Highlights] Vishay unveils 600V Hyperfast and Ultrafast Rectifiers for EV battery charging stations

The rectifiers are designed to increase the efficiency of AC/DC and DC/DC converters



Source: Getty Images/Ivan Bajic

Vishay Intertechnology has developed 10 new FRED Pt Gen 5 600 V Hyperfast and Ultrafast rectifiers, the company said in a press release on 29 March. The rectifiers are designed to increase the efficiency of AC/DC and DC/DC converters. According to the company, the devices offer 30% lower reverse recovery losses while maintaining low conduction and switching losses, resulting in full-load efficiency in high speed LLC output rectification stages for EV/ HEV battery charging stations.

Outlook and implications

The rectifiers are RoHS-compliant and halogen-free and offer high temperature operation up to +175 °C.

In February, Vishay has unveiled new NTC thermistor with PEEK-insulated, nickel-iron (NiFe) leads and a low thermal gradient and the expansion of its NCW AT family of wide terminal thin film chip resistors and a new p-channel MOSFET to increase power density and efficiency in automotive applications.

[Supplier Trends and Highlights] Cinemo ties up with iQIYI for video-on-demand in-vehicle multiscreen content in mainland China

The companies will power the in-car entertainment on Faurecia Xiamen IVI platforms in FAW Hongqi's flagship sedans



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Source: Getty Images/Prykhodov

Cinemo has partnered with iQIYI to deliver video-on-demand multi-screen content into the vehicle, the company said in a press release on 29 March. The companies will power the in-car entertainment on Faurecia Xiamen IVI platforms in FAW Hongqi's flagship sedans. iQIYI will offer technical capabilities, and customized adaptations based on Cinemo's technical solutions for optimal in-vehicle audio-visual experience.

“We are delighted to have worked with iQIYI and on this project. At Cinemo, we are dedicated to delivering a magical movie experience in the car, and to have the opportunity to do this for Chinese consumers has been a fantastic opportunity,” said Charly Lippoth, director, Global Infotainment Partnerships, Cinemo.

Outlook and implications

Cinemo specializes in automotive grade multimedia playback, streaming, media management, connectivity, and cloud access middleware. In November 2020, Cinemo announced a partnership with Faurecia Xiamen under which it will deliver Android OS-based head unit and rear-seat-entertainment systems.

iQIYI is an online video platform of FAW Hongqi and will provide in-car online video services for the Hongqi H9.



[VIP ASSETS] IHS Markit Analysis and Commentary | Confluence of Supply Chain Challenges Across the Global Auto Industry



With the first quarter nearly in the rearview mirror, global automotive production figures in Q1 are expected to expand by 12% vs 2020 once final tallies are in, as the auto industry recovery from the pandemic is being challenged by the perfect storm of month-long capacity constraints at the juncture of becoming a choke point for the sector as well as isolated natural disasters.

First, the global semiconductor shortage due to capacity constraint and lack of inventory for microcontrollers, the majority of which are sourced from one supplier in Taiwan. Next, a Texas snow/ice storm hit, which shuttered chemical plants and forced raw material shortages for seat foam and airbag materials, while also forcing three semiconductor plants to shut down, further contributing to the shortage. And the recent fire at a semiconductor manufacturer in Japan has hampered several OEMs, some of which had so far managed to avoid impacts from wider semiconductor shortages. Additionally, concerns around the impact of steel inventory shortages in light of surging demand from multiple industries are beginning to emerge across multiple industries, including the automotive sector. Lastly, delays at US ports for capacity constraints to handle a surge in container deliveries are leaving automakers and suppliers wondering about transit times for their parts and the Suez Canal conundrum is bound to also have an impact, though it is not yet certain on the specific aspects.

As OEMs and suppliers continue to evaluate the resiliency of their supply chains and inventories as well as adapting their OEM schedules to reflect these, IHS Markit analysts have been keeping abreast of developments.

As of this writing, IHS Markit forecasts the implications on Global light vehicle production to be estimated at **1.3 million units across the first quarter**. The fire at Renesas's Naka facility in Japan, which broke out in the morning of Friday 19th March and ongoing disruption following the severe weather that hit the south west United States in February means that we are more cautious about the speed and level of recovery we will see in 2021. The affected semiconductor operations in both Japan and United States are expected to be offline for at least a month and will take longer to return to full capacity adding to the burden that the industry is facing. These latest impacts to global semiconductor supply lead us to think that Q2 could be as exposed as Q1, while stabilization of supply may not emerge until Q4, with recovery efforts starting only in early 2022.

Much of the impact on new vehicle sales remains to be seen at this stage, as inventory levels remain healthy enough to meet today's demand. As time goes on, the availability of high volume, popular vehicles may be an issue in larger markets.

“With production in Q1 expected to expand by 12 percent vs 2020, the auto industry recovery from the pandemic is being challenged by the perfect storm of month-long capacity constraints at the juncture of becoming a choke point for the sector as well as one-off challenges of natural disasters,” said Matteo Fini, Vice President, Automotive Supply Chain, Technology and Aftermarket, IHS Markit.



There is anecdotal evidence that auto suppliers' restocking in various sectors now that a recovery of volume demand is materializing is adding to the problem, it remains to be seen whether this will result in sporadic or ongoing auto plant shutdowns.

Semiconductors update

On February 15th, NXP's, Infineon's and Samsung's fabs in and around Austin, TX were forced to shut down due a winter storm that disrupted power and water supplies. The week-long closures will be felt for months. Infineon announced last week that they expect the fab to reach pre-shutdown output level in June. Samsung is reportedly targeting mid-April to start output again, but it is unknown if capacity will be at pre-shutdown levels, or if those will occur later.

Renesas' recent fire in the 300 mm cleanroom at its Naka fab in Japan impacted a small area of the fab but it damaged water supply, air conditioning and manufacturing equipment. In an update, Renesas reports 23 machines must be replaced. 11 units will be procured by end of April but some of the machines may not be procured until after June. While production will restart 2 months after the fire, Renesas does not expect to recover full production capacity before 100 days after the fire.

While the shutdowns in Texas and Naka are known issues, there is a potential issue looming in the near future worth highlighting now too. Taiwan is experiencing its worst drought in decades. Making semiconductors requires large amounts of ultra-pure water. A water shortage in the region means less available water for all activities. While TSMC and UMC are able to recycle over 85% of their water, additional water is required, on the order of tens of millions of gallons/day. Reservoirs are holding only about 10% of their capacities.



“Contingency plans are for water to be trucked to the fabs as needed, but given how 2021 has gone so far for the semiconductor supply chain, the water situation is worth putting on the list of “things to watch,” said Phil Amsrud, senior principal automotive semiconductor analyst, IHS Markit.

However, the supply chains are all tight currently and coupled enough that disruptions to non-automotive markets impacts the automotive sector. The original expectation for the auto supplies of semiconductor-content impacted by shortages to begin to be in a better position in Q2 and by Q3 and able to meet ongoing demand now appears optimistic, with a likely slippage by a quarter, with Q4 now looking like the first opportunity for supply to keep up with demand. However, IHS Markit estimates it will be Q1 2022 before there will be enough capacity to keep up with demand and to begin filling missed backlog.

Other shortages



Several auto parts are also potentially at risk of disrupting auto production due to their own upstream supply chains generally running tight on inventory and slowly recovering demand, thus magnifying the impact of natural disasters or various plant outages. The impacts of these events might become apparent any time between two to ten weeks at the OEM plant level. For example in the case of **polypropylene**, a key raw material for the auto industry used in bumpers, carpets and other applications is facing tighter than normal supply due to the combination of lack of feedstock, plant outages and transit bottlenecks due to lack of containers and longer than expected transit times as ports have limited the ability to compensate on a global basis from available capacity. Such situation is not expected to resolve before May.

With the **Suez Canal** blocked for six days after the Ever Given ran aground on March 23, and a significant backlog of ships now having to make their way through, automakers and suppliers are fretting about their parts availability.

The Suez Canal is a key source for auto parts with some \$1.7 billion worth of parts being shipped in a normal year northbound into European ports (60 percent of which are from Japan and China, 20 percent from South Korea) and \$1.3 billion shipped southbound, three quarters of which go into China.

Even if the blockage is resolved within a week, there may be delays in port operations in handling the increased volumes, thus creating sourcing bottlenecks for automakers and suppliers. Visibility into the impacted companies and supplies remains limited to date.

Steel production is also being caught in these shortages, particularly in the US. IHS Markit steel experts report that US steel plants' utilization averaged 76% in February, still down from an average of 82% in February 2020 but up sharply from the pandemic low of 51% in early May 2020. As the restart of steel production has been slow in recovering from the pandemic and OEMs ramp up demand and replenish their inventories, shortages are beginning to emerge.

Coil Steel Spot prices have increased in averaged spot price by \$687 per metric ton since Q3 2020 for three main steel categories in use in the automotive sector, adding about \$350 per vehicle. Any OEM with short inventory in the US will be facing such prices.

“A recurring theme in all of these shortages or capacity constraints is an increase in prices for raw materials, which suppliers will have to pass onto OEMs and later onto consumers,” said Fini. “However, such process is not immediate and not to be taken for granted.”

Some raw material cost increases are indexed so an increase in raw material prices results in an input cost increase for OEMs and suppliers, but for many others this is not the case, which often means the OEM or the suppliers will be called upon to absorb such increases depending on the case.

IHS Markit analysts are continuing to track all of these issues and we may be in a position to share additional updates as forecasts are adjusted to incorporate the latest OEM announcements and factors.

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