

# European Electronic Markets Forecast

## EMEA EMS Industry forecast to reach Euro 37 billion by 2024

Following the slowdown witnessed in the final months of 2019, the EMS industry across EMEA entered 2020 with signs that market would gradually return to growth and then gain momentum in 2021 and 2022. The actual outcome was unprecedented, as the spread of COVID-19 plunged the global economy into the deepest recession since the "Great Depression". As we move into 2021 and look back, the EMS industry in 2020 performed significantly better than the forecasts made during the second quarter. The EMS industry has not only proved to be resilient but has been able to support the fight against the pandemic through the production of vital medical equipment.

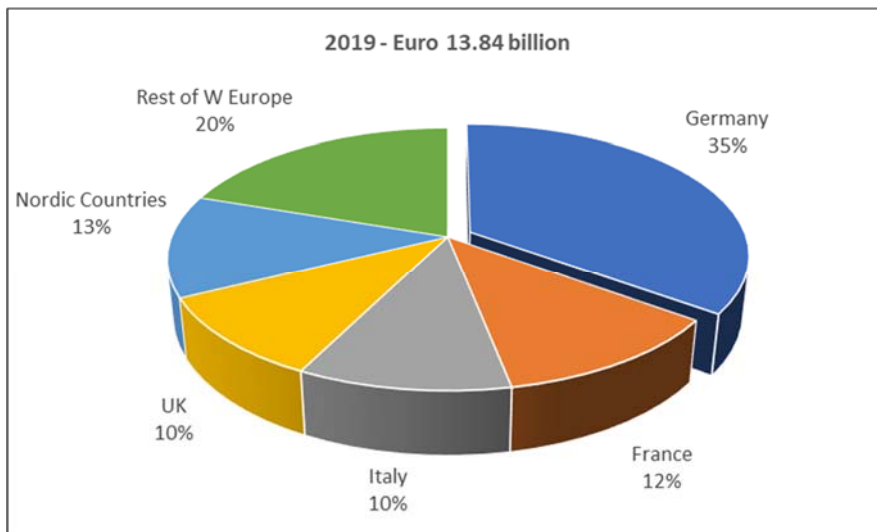
Over its history, the European EMS industry has rebounded from a series of downturns, including the global financial crash in 2008/2009 and more recently the eurozone crisis, and despite the limited visibility at the beginning of the year it is expected to emerge from the current pandemic over the course of 2021.

In 2019, the total market for EMS in Western Europe was estimated at Euro 13,843 million (2018 Euro 14,161 million), according to figures released by Reed Electronics Research, with the principal countries of Germany, France, Italy and UK totalling Euro 9,359 million (2018 Euro 9,586 million). After robust growth of 6.7% in 2018 EMS revenues in Western Europe declined by 2.2% in 2019 on the back of weaker demand in the later part of the year and is forecast to decline by 7.0% in 2020 to Euro 12,875 million. The Western European EMS industry has rebounded at a faster rate than expected following the sharp downturn in the second quarter but the recovery remains fragile despite the roll-out of the vaccine.

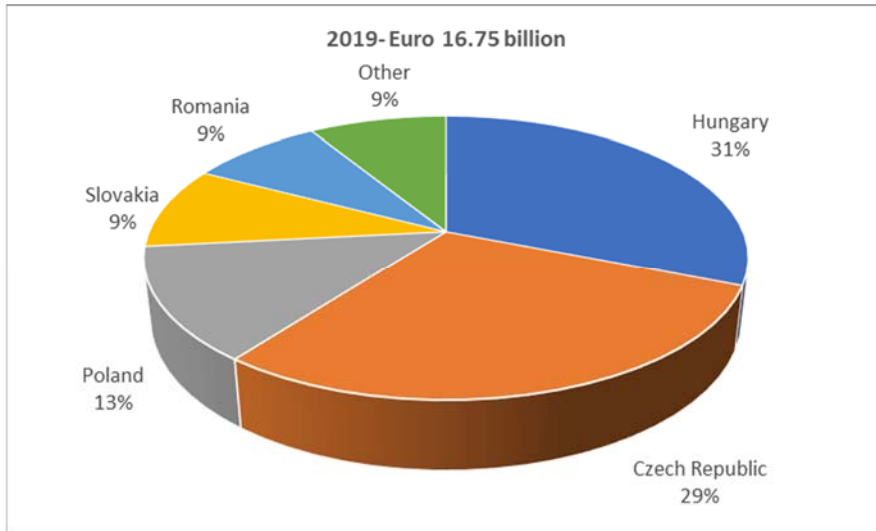
In 2021, RER is currently forecasting a weak start to the year which will gradually recover in the second quarter and then pick up in the second half of the year before accelerating in 2022 and 2023. Based on current forecasts, which should be considered with caution due the current uncertainties surrounding the path of the virus, EMS revenues in Western Europe will only surpass 2018 and 2019 levels in 2023.

For CEE in 2019, the total market for EMS was estimated at Euro 16,754 million (2018: Euro 15,877) with the majority of the revenues coming from the major Group 1 companies with volume manufacturing operations in Czech Republic, Hungary, Poland and Slovakia. By 2024, the market is forecast to reach Euro 19,932 million and account for 53.7% of the total.

Activities in the Middle East & North Africa (MENA) amounted to Euro 2,061 million in 2019, up from Euro 2,019 million in the prior year. Growth in Israel and at the low-cost sites of European-owned EMS in North Africa offsetting declining



West European EMS Market 2019  
(EMEA EMS Industry 2019-2024, Source: Reed Electronics Research)



CEE EMS Market 2019

(EMEA EMS Industry 2019-2024, Source: Reed Electronics Research)

stable as demand was boosted by the increased number of people staying at home. After the sharp decline in the second quarter of 2020 the demand for home appliances rebounded in the third quarter and is expected to show modest growth for the year as a whole, a trend which should continue over the forecast period. The move to adopt smart home devices such as smart speakers, smart lighting and smart thermostats will show strong growth over the period to 2024.

**Aerospace** – Previously resilient to economic shocks, air traffic had more than doubled since

revenues in Turkey. Growth is expected to accelerate in the later part of the forecast and reach Euro 2,392 million in 2024.

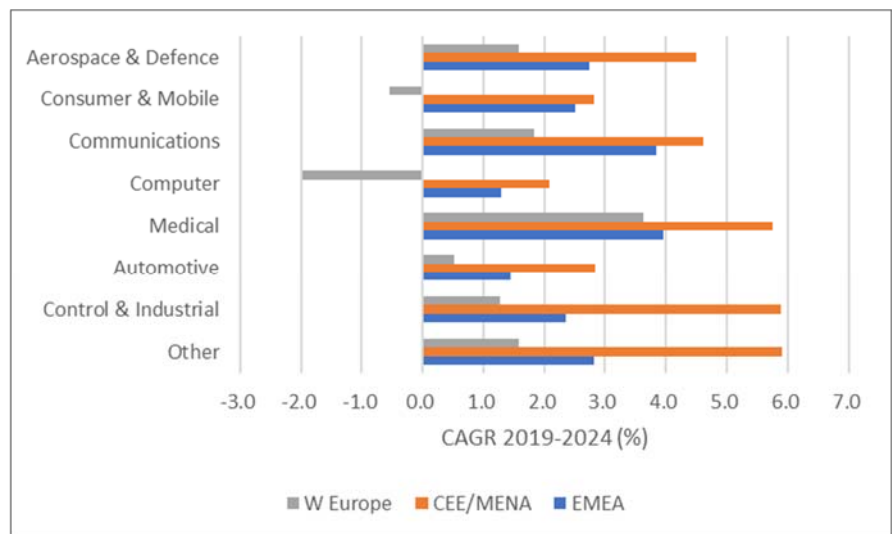
Looking forward, the one prevailing factor facing the EMEA EMS market is uncertainty. After the global financial crisis in 2008/2009, we saw a sharp global rebound across virtually all end markets. The rebound from the pandemic will be different, with wide fluctuations in growth across markets and geographical regions. Below, we briefly highlight current market developments.

**Computer** – Following the spike in demand within the PC/tablet market we expect growth to return to pre-COVID levels in 2021/2022 with a modest decline in the later part of the forecast. By the end of 2024, virtually all volume computer production in Europe will be within CEE. The demand for new data centres will continue and boost output over the forecast period, again with major Global Group 1 companies the main beneficiaries. The Industrial PC market, will recover in response to a gradual recovery in manufacturing as the global economy rebounds over the course of 2021 with production forecast to post growth of between 2-4% in the period to 2024, demand supported by the move for increased automation and the emergence of smart manufacturing.

**Consumer & Mobile** –TV shipments, which at the outset of the pandemic were forecast to show high-single digit declines, remained relatively

2000, the pandemic has resulted in the virtual collapse in number of people flying. Airlines quickly cancelled or postponed orders for new aircraft which resulted in a sharp decline in the production – deliveries of new aircraft at Airbus were down 40% in the first nine months of 2020 – which has in turn fed through into the supply chain and ultimately lower demand for EMS. The second wave of the pandemic at the end of 2020 and which has continued into 2021 has led to governments once again closing air corridors. This is expected to push-back the recovery with many observers predicting that demand will not rebound until the second half 2022 and for some potentially not until 2023. The return to skies of the Boeing 737 Max at the end of 2020 potentially should give a boost to the market.

**Defence** - In contrast to the aerospace segment, defence spending over the course of the pandemic has remained relatively stable, in part, due to the nature of



2019-2024 EMEA EMS Revenues - CAGR by Sector

(EMEA EMS Industry 2019-2024, Source: Reed Electronics Research)

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industry and the signing of long-term production contracts. Over the period to 2024, EMS companies operating in the defence segment will benefit by the focus by governments globally to focus on military modernization to meet growing global security concerns.

*Medical* – Demand for products required in the fight against the pandemic boosted medical EMS revenues across both Western Europe and CEE/MENA in 2020, although in terms of the overall market this was offset by weaker demand for products used for elective surgery and other non-essential procedures. Growth is expected to return to pre-COVID levels in 2022 and then post growth of 3-4% in the period to 2024.

*Communications* – Although the deployment of 5G and the increased adoption of IoT will dominate developments within the communications market, LTE will remain the dominant mobile access technology by subscription during the forecast period. The Internet of Things (IoT) is forecast to increase sharply on a global basis and Ericsson forecasts that the number of IoT connections will total 12.6 billion by the end of 2020 before rising to 26.9 billion by 2026. The deployment of private cellular networks will accelerate over the period to 2024 as, initially larger enterprises, look to increasing digitalise their operations, although this is expected to quickly filter down to medium-sized enterprises. Within Europe, spending on networking equipment markets is forecast to contract by single-digits in 2020. The operations of small and medium-sized businesses have been particularly hard hit by the COVID-19 crisis.

*Automotive* – EMS companies with a significant exposure to the automotive market were badly hit by the unprecedented decline in new car registrations across Europe and globally. With auto plants shutdown across Europe in the second quarter and despite a strong rebound in Q3, the introduction of new measures to stop the spread of the virus in the final quarter of 2020 will result in passenger car production in Western Europe declining by 25% for the year as a whole. With measures to control the pandemic remaining in place at the beginning of 2021 and combined with the growing shortages of key electronic components, primarily semiconductors, passenger car production is expected to remain weak over the first months of the year. For EMS companies, we expect demand from automotive customers to remain subdued over the first half of 2021, before recovering over the remainder of the year. Over the period to 2024, EMS companies will benefit from the move to electric vehicles, the increased the demand for driver assistance and connectivity including advanced infotainment systems. account for the majority passenger cars, EMS companies will ultimately need to increase their focus on the faster growing EV segment.

*Control & Industrial/Other* – The adoption of smart manufacturing and the growth in IoT will drive demand in the control and industrial segment. The segment encompasses a broad range of industries from mass transportation and security to energy, marine, engineering and machinery and highlights the diverse range of markets served by European EMS companies. Although some end markets, notably semiconductor capital equipment, and customers reported growth the overall trend in 2020 was down. The recovery is also expected to be uneven with the willingness, or ability, of customers to invest in new capital equipment and make the transition to new smart manufacturing/ Industry 4.0 a key factor.

*Since 1993, Reed Electronics Research has tracked developments in the EMEA EMS industry through a series of reports and custom research. The latest study, the 18<sup>th</sup>, provides an in-depth analysis of the market through to 2024 by country/region and end-market as well as track the competitive landscape. For further information, including the full contents and sample data, please contact [andrew.fletcher@rer.co.uk](mailto:andrew.fletcher@rer.co.uk) or visit [www.rer.co.uk](http://www.rer.co.uk).*

### Industrial and automation to drive growth in machine vision

The global industrial and automation machine vision camera market will expand to US\$5.5 billion in 2026, at 7.4% CAGR according to the latest report from *Yole Développement*. Yole's forecast is for 5.0 million machine vision cameras to be sold in 2026 with 26.9 million units ADC camera modules in the same year.

CMOS Image Sensor (CIS) technology is now dominating the industrial vision market, with 86% of market sales in 2020, although CCD will remain some niche markets. In the supply chain, Keyence remains the biggest camera player with a market share of 17%, followed by Cognex 14% and FLIR 9%.

Although the market is currently dominated by CIS technology, over the period to 2026 other technologies such as 3D technology and multi-spectral imaging in industrial cameras will gain market share over the forecast period.

### Worldwide IT spending to grow 6.2% in 2021

Worldwide IT spending is projected to total US\$3.9 trillion in 2021, an increase of 6.2% from 2020, according to the latest forecast by *Gartner, Inc.* Worldwide IT spending declined 3.2% in 2020 as company's prioritized spending on technology and services that were deemed "mission-critical" during the initial stages of the pandemic.

The unprecedented speed of digital transformation in 2020 to satisfy remote working, education and new social norms presented lockdowns and social distancing measures as double-edged swords – one which has abated the pandemic's negative effect on IT spending going into the New Year.

All IT spending segments are forecast to return to growth in 2021 (see Table 1). Enterprise software is expected to have the strongest rebound (8.8%) as remote work environments are expanded and improved. The devices segment will see the second highest growth in 2021 (8%) and is projected to reach US\$705.4 billion in IT spending.

There are a combination of factors pushing the devices market higher, as countries continue remote education through this year, there will be a demand for tablets and laptops for students. Likewise, enterprises are industrializing remote work for employees as quarantine measures keep employees at home and budget stabilization allows companies to reinvest in assets that were delayed in 2020.

Through 2024, businesses will be forced to accelerate digital business transformation plans by at least five years to survive in a post-COVID-19 world that involves permanently higher adoption of remote work and digital touchpoints. Gartner forecasts global IT spending related to remote work will total US\$332.9 billion in 2021, an increase of 4.9% from 2020.

Despite the availability of COVID-19 vaccines, the virus will continue to require government health interventions throughout 2021. Non-COVID-19 geopolitical factors such the U.S.-China tension will also inhibit recovery for some regions.

Overall, returning global recovery back to 2019 spending rates will not occur until 2022, although many countries may recover earlier. People-gathering industries, such as restaurants, travel and entertainment, will hover at the bottom long-term.

## Private LTE/5G infrastructure market to reach US\$5.7 Billion in 2024

Private LTE/5G infrastructure is any 3GPP-based LTE and/or 5G network deployed for a specific enterprise/ industrial customer that provides dedicated access. It includes networks that may utilize dedicated (licensed, unlicensed, or shared) spectrum, dedicated infrastructure, and private devices embedded with unique SIM identifiers. Private LTE/5G infrastructure carries traffic native to a specific organization, with no shared resources in use by any third-party entities.

According to *IDC*, worldwide revenue attributable to the sales of private LTE/5G infrastructure will grow from US\$945 million in 2019 to an estimated US\$5.7 billion in 2024 with a 5-year compound annual growth rate (CAGR) of 43.4%. This includes aggregated spending on RAN, core, and transport infrastructure.

Private LTE infrastructure is already used by select verticals worldwide to solve mission-critical networking challenges. However, the barrier to consumption has remained high, limiting adoption to organizations possessing in-house competency and access to dedicated spectrum. With more spectrum being made available for enterprise uses, coinciding with the arrival of commercial 5G, interest has grown toward using private LTE/5G solutions as a basis for connectivity across a multitude of mission-critical, industrial and traditional enterprise organizations.

Many organizations are deploying private LTE today, and a select few are beginning to deploy private 5G in limited instances. While many of these verticals overlap in both use case and network needs, the market opportunity can be categorized in three segments:

*Mission-critical:* Verticals that require "always on" connectivity addressable through redundancy and dedicated resource, as well as the clear need or desire for mobile site connectivity. Loss of connectivity would

Worldwide IT Spending Forecast (Millions of US Dollars)

	2020 Spending	2020 Growth (%)	2021 Spending	2021 Growth (%)	2022 Spending	2022 Growth (%)
Data Centre Systems	214,985	0.0	228,360	6.2	236,043	3.4
Enterprise Software	465,023	-2.4	505,724	8.8	557,406	10.2
Devices	653,172	-8.2	705,423	8.0	714,762	1.3
IT Services	1,011,795	-2.7	1,072,581	6.0	1,140,057	6.3
Communications Services	1,349,891	-1.7	1,410,745	4.5	1,456,637	3.3
Overall IT	3,694,867	-3.2	3,922,833	6.2	4,104,906	4.6

Source: Gartner (January 2021)

likely result in significant negative business or operational outcomes.

*Industrial:* Verticals whose primary focus is process and industrial automation for Industry 4.0. It also generally involves providing high-capacity and ultra-reliable low-latency communication (5G URLLC) either with time-sensitive networking (TSN), or as an alternative.

*Traditional enterprise or "Business-Critical":* These are verticals that require deterministic wireless networking beyond traditional Wi-Fi, but where redundancy and automation needs are lower. These include "business critical" applications, where loss of connectivity could result in loss of revenue.

### Demand for robotic goods-to-person systems will quadruple through 2023

Through 2023, demand for robotic goods-to-person (G2P) systems will quadruple to help enforce social distancing in warehouses, according to *Gartner, Inc.* With G2P systems, the robots deliver the goods to a person who remains in one place.

While there's a variety of technological solutions to address social distancing in warehouses – including technology that traces each employee's move – robotic systems are easier to implement and less invasive. Keeping people in place and using a virus-resistant robot to move goods around respects people's privacy and keeps them safe at the same time.

In addition to this short-term value, G2P systems also drive broader long-term improvements in efficiency and productivity. Advanced systems also offer additional benefits such as improved storage density.

Gartner also predicts that through 2024, 50% of supply chain organizations will invest in applications

that support artificial intelligence (AI) and advanced analytics (AA) capabilities. This may be to address foundational areas such as data quality or connecting disparate silos, or strategic objectives such as migrating to more automated, resilient and smarter applications.

### EMEA PC market posts double-digit growth for a third consecutive quarter

The Europe, Middle East, and Africa (EMEA) traditional PC market (desktops, notebooks, and workstations) posted strong growth in 2020Q4 (16.6% YoY) and totalled 24.1 million units, according to *IDC*. The continued impact of COVID-19 and subsequent high demand for traditional PC shipments resulted in strong growth for consumer (21.3% YoY) and commercial (13.6% YoY).

The Western European PC market posted the strongest results of the regions in EMEA, growing 20.0% YoY. Despite the expected weak result of desktops (-25.0% YoY), the market was heavily offset by the continued strong performance of notebooks (39.4% YoY) which reached 12.9 million units. The exceptional notebook performance can once again be attributed to the massive demand in consumer and education. Extended lockdowns and increased restrictions have translated into an even stronger urgency for devices that support entertainment and remote learning, drilling home the necessity of one device per-person rather than per-household. Market growth could have been even greater, but supply constraints, particularly on panel and entry level CPUs, created bottlenecks that meant the full demand could not be satiated.

Consumer in Western Europe saw an increase of 32.1% YoY, reaching 6.9 million units in 2020Q4. On top of the strong notebook performance, desktop also enjoyed positive results, growing 12.4% YoY. Gaming continued

#### Top 5 Companies: Europe, the Middle East and Africa (EMEA) Traditional PC Shipments 2020Q4 (000)

Company	2020Q4 Shipments	2020Q4 Share (%)	2019Q4 Shipments	2019Q4 Share (%)	YoY Growth (%)
Lenovo*	6189	25.7	5274	25.5	17.4
HP	5593	23.2	5860	28.3	-4.6
Dell	3545	14.7	2865	13.8	23.8
Acer	2275	9.4	1582	7.6	43.9
ASUS	1956	8.1	1470	7.1	33.1
Other	4549	18.9	3635	17.6	25.2
Total	24108	100	20685	100	16.6

Notes: \* includes Fujitsu; Source: IDC Quarterly PCD Tracker EMEA preliminary, 2020Q4

to be an area of growth as consumers still look for ways to entertain themselves and socialize with friends during lockdowns. Beyond education, the commercial market was less buoyant, although it still grew 12.2% YoY to reach 9.2 million units.

Despite the Russian PC market underperforming and contracting by 2.8% YoY, the overall PC market in the CEE region grew by 14.3% YoY, in line with the latest forecast. The ongoing education deals across a few countries have certainly helped to maintain growth in the commercial space, which was recorded at 21.4% YoY and continuously fuelled by work from home needs, while consumer increased 9.0% YoY.

The MEA region reported good overall growth driven exclusively by the commercial segments at 12.4% YoY compared to consumer declining by 2.8% YoY.

### Outlook for oil and gas industry

*DNV-GL's* annual survey of senior oil and gas professionals highlights how 2020 has taken its toll on the industry. Only 39% are confident about industry growth in 2021, and the same proportion (39%) are pessimistic. Just two years ago, 76% were confident and only 7% were pessimistic.

But there are some positives that the industry can take into 2021. The industry appears to be more confident about the year ahead than it was following the last oil price crash in 2014, when only 28% of the survey respondents were confident about industry growth in the year ahead – some 11 points lower than this time around.

Another difference is spending, where the industry is not hitting the brakes as hard as it did after the last crisis. While the proportion of respondents expecting to either maintain or increase capital expenditure (capex) in the year ahead has fallen to 62% – down from 72% going into 2020 – by the fourth quarter of 2015, a similar period (roughly a year) into the last downturn, it had fallen to 43%.

According to *DNV-GL*, there are two possible explanations for this difference. On the one hand, the industry may be expecting the COVID-19 vaccination roll-out to prompt a strong and quick recovery in demand for oil and gas. In 2015–17, by contrast, there was an oversupply imbalance without the expectation of a sharp increase in demand, so it was reasonable then to expect a longer period of pain.

Another possibility, however, is that these more robust capex intentions are due to strengthened commitments to transformation into a lower-carbon energy system. The research supports this, with greater expectations to increase capex among those

who are actively adapting to a low-carbon energy mix (65% compared with 52%); meanwhile 57% of respondents overall say that their organization will increase investment in renewable energy projects in 2021.

### Market notes

- The worldwide smartphone market continued to improve in the holiday quarter of 2020 (4Q20) returning to familiar ground with 4.3% year-over-year growth. According to preliminary data from *IDC*, smartphone vendors shipped a total of 385.9 million devices during the quarter. While the full year 2020 declined 5.9% compared to 2019, the progress toward market recovery has been impressive and *IDC* believes the momentum heading into 2021 will remain strong.

- Banning Chinese vendors from Western countries' 5G deployments on the grounds of alleged equipment security concerns will have a detrimental effect on 5G rollouts and technology evolution for the years to come. According to new research from *ABI Research*, excluding Huawei from deployments will delay the 5G rollout by several years and burden network operators with additional costs of several billion dollars to replace existing infrastructure.

- Thanks to the stay-at-home economy brought about by the COVID-19 pandemic, TV shipment in North America saw the start of an upturn in late March last year, while demand in the European market also gradually ramped up in 2H20, according to *TrendForce's* latest research. On the whole, global TV shipment rebounded from rock-bottom levels in April and peaked in October 2020. Nonetheless, recent shortages in IC products from upstream semiconductor suppliers led TV brands to push back their 4Q20 shipment schedules, resulting in a global TV shipment of 217 million units in 2020, a 0.3% YoY decline. Looking ahead to 2021, *TrendForce* is not ruling out the possibility that the Tokyo Olympic Games and the UEFA European Championship, which were originally planned for 2020 but subsequently delayed due to the pandemic, will take place this year instead, despite the unpredictable nature of the pandemic. These sporting events are expected to drive global TV demand to yet another record high. In this light, *TrendForce* expects global TV shipment to reach 223 million units in 2021, a 2.8% YoY increase.

- With the pandemic still in full swing, traditional PCs (inclusive of desktops, notebooks, and workstations) were once again an in-demand consumer technology. The fourth quarter of 2020 (4Q20) saw global shipments grow 26.1% year over year to 91.6 million units, according to *IDC*. The same category of devices grew 13.1% year over year for the full year 2020 with the catalysts being work from home, remote learning, and restored consumer demand. To put things into

perspective, the last time the PC market saw annual growth of this magnitude was 2010 when the market grew 13.7%. A lot has changed in those ten years, including six years of PC market decline, as well as a year of flat growth. The question now is how long this resurgence will last.

- Owing to the impact of the COVID-19 pandemic, global smartphone production reached a mere 1.25 billion units in 2020, a 11% YoY decline, according to figures released by *TrendForce*. The company believes that the global smartphone market will gradually recover as people become accustomed to the "new normal" resulting from the pandemic. Moreover, this year will likely see a relatively strong wave of device replacement demand as well as demand growth in the emerging markets. Assuming that these conditions will materialize, the annual global smartphone production for 2021 is forecast to increase by 9% to 1.36 billion units. Thanks to the Chinese government's aggressive push for 5G commercialization in 2020, global 5G smartphone production for the year reached about 240 million units, a 19% penetration rate, with Chinese brands accounting for almost a 60% market share. While 5G will remain a major topic in the smartphone market this year, various countries will also resume their 5G infrastructure build-out, and mobile processor manufacturers will continue to release entry-level and mid-range 5G chips. As such, the penetration rate of 5G smartphones is expected to undergo a rapid increase to 37% in 2021, for a yearly production of about 500 million units.

## Industry Outlook

### *Eurozone*

Eurozone manufacturing output continued to expand at a solid pace at the start of 2021, though growth has weakened to the lowest since the recovery began as new lockdown measures and supply shortages pose further challenges to producers across the region. After accounting for seasonal factors, the *IHS Markit Eurozone Manufacturing Purchasing Managers' Index (PMI)* recorded 54.8, down slightly on December's 55.2. January's figure was amongst the highest seen over the past two-and-a-half years.

The best manufacturing growth was again seen in those countries with strong export bases, the Netherlands and Germany. In the Netherlands, expansion was the sharpest seen for over two years. Italy also turned in its best performance for nearly three years, whilst there was also marked growth seen in Austria. Elsewhere, rates of expansion tended to be modest or, in the case of Greece, stagnant. Spain was the only country to record a contraction.

A noticeable development in January was a further worsening of supplier delivery times, which deteriorated for a twelfth successive month. Latest data showed that lead times lengthened to a degree unmatched since April 2020 amid evidence of challenges in securing supplies from Asia. Another marked rise in purchasing activity, the fifth successive increase, added to pressure on vendors. With supply-side shortages intensifying, prices paid for inputs increased markedly.

January's survey showed that input costs rose to the greatest degree in nearly three years with Germany, the Netherlands and Italy recording the sharpest monthly increases. Whilst firms sought to pass on these higher costs on to clients, the overall rate of inflation was modest and noticeably weaker than input costs.

Finally, looking ahead to the next 12 months, confidence improved to a three-year high in January largely on hopes that vaccine developments in the coming months will help to ease current pandemic restrictions and lead to a noticeable uplift in economic activity.

### *Germany*

The German manufacturing sector remained in growth territory in January and is doing a lot of the heavy lifting in terms of supporting overall economic activity during the current lockdown.

At 57.1 in January, the headline *IHS Markit/BME Germany Manufacturing PMI* remained firmly inside growth territory, albeit down from December's near three-year high (58.3) and the lowest for four months.

However, the survey gives some cause for concern regarding the growing incidence of supply delays. Increasing demand for inputs from manufacturers, combined with shortages of materials and shipping containers has created a perfect storm for supply chains, with January's survey indicating a record increase in lead times.

Whilst any impact on actual production levels seems to have been only limited so far, with output keeping pace with new orders, we are seeing declining levels of inventories at manufacturers, and therefore a growing risk of disruption.

The degree of optimism shown by manufacturers towards production levels in a year's time strengthened to a series record high (since July 2012) in January. Many firms were hopeful of a further recovery in demand and client investment once the COVID-19 vaccine rollouts were well under way.

### *France*

January's PMI results were emblematic of the current situation with COVID-19 as demand conditions began



to improve amid expectations of a recovery, while output remained subdued because of ongoing restrictions designed to stem the spread of the virus. The first improvement in new orders for three months, coupled with the strongest expectations for the year ahead since April 2019, indicated that confidence is building. However, firms were unable to respond with increased production, causing backlogs to rise again.

The seasonally adjusted *IHS Markit France Manufacturing PMI* posted 51.6 in January, up from 51.1 in December. The latest reading indicated the quickest improvement in the health of the French manufacturing sector for six months, albeit one that was modest overall. The improvement in business conditions was partially driven by a return to growth in new orders during January. The result marked the first increase in sales since October. That said, the rate of expansion was only slight overall.

Suppliers' delivery times faced by goods producers in France lengthened markedly during the latest survey period. Panel members often commented on severe delays at ports resulting from the end of the Brexit transition period. The rate at which vendor performance deteriorated was, however, softer than those seen at the onset of the pandemic.

Finally, manufacturers remained optimistic towards the 12-month business outlook in January. Confidence was supported by expectations for an improvement in demand conditions as COVID-19 vaccines become more widely available. Notably, the degree of positivity was the strongest since April 2019.

### Italy

The seasonally adjusted *IHS Markit Italy Manufacturing PMI* climbed from 52.8 in December to a 34-month high of 55.1 in January and signalled a solid improvement in the health of the manufacturing sector. Central to the stronger recovery was a noticeably quicker rate of order book growth and a further sharp upturn in factory production. Gains in sales also came from abroad during the first month of 2021, as new export orders rose for the fourth time in five months and solidly, amid reports of stronger demand from both Europe and north America.

Stronger demand also led firms to accelerate their purchasing activity during January, with the rate of increase the quickest since early-2018 and sharp. Supply chains remained under severe strain, however, with delivery times lengthening to the greatest extent since May and markedly. According to respondents, stock shortages and COVID-19 related restrictions were the cause of delays.

Finally, firms remained confident with regards to output over the coming 12 months in January. Hopes of a swift end to COVID-19 related restrictions and a strong economic recovery were cited as reasons to be optimistic.

### Spain

The seasonally adjusted *IHS Markit Spain Manufacturing PMI* slipped back below the 50.0 no-change mark in January, posting 49.3, down from 51.0 in December to mark a second marginal contraction of the sector in the past three months.

Manufacturing output declined slightly in January due in main to the sharpest reduction in new work since last May. There were reports that Storm Filomena, plus the continuation of restricted market activity due to the ongoing COVID-19 pandemic, had weighed on both production and demand. International demand was also lower, declining slightly for the second time in the past three months.

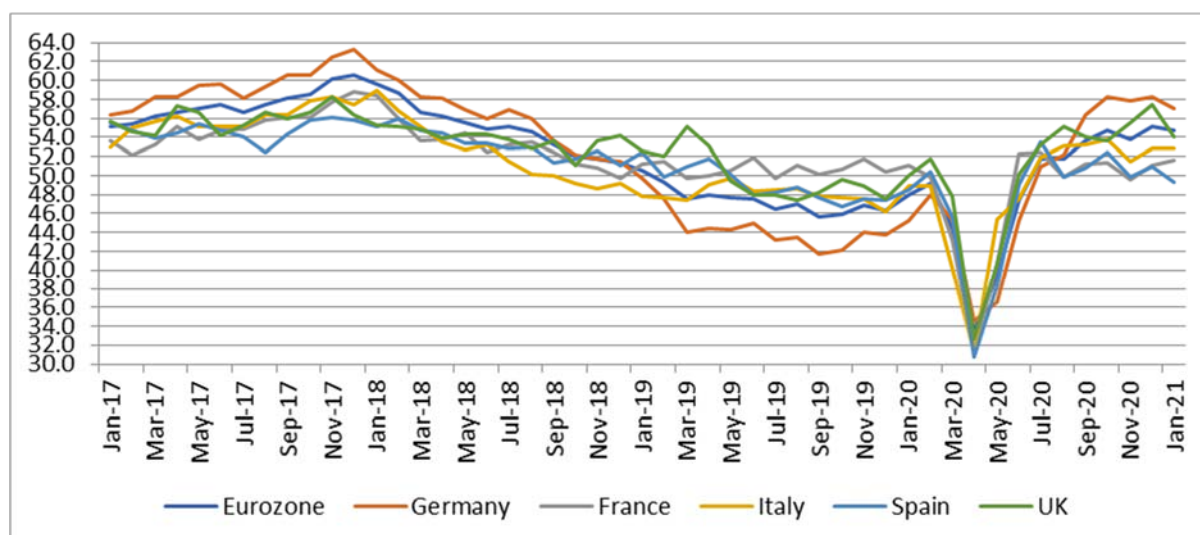
Another factor hampering production was ongoing delays in the delivery of inputs. Average lead times deteriorated for a fourteenth successive month, and to the greatest extent since last May. There were reports of delays in shipments from Asian suppliers – reflective in part of a lack of freight capacity – plus staff and stock shortages at vendors in general. Inclement weather added to delivery challenges.

### UK

The upturn in the UK manufacturing sector slowed sharply at the start of 2021. Output growth eased and new orders fell slightly as producers faced weaker inflows of new export work and temporary supply-chain disruptions caused by COVID-19 restrictions and transport delays (especially at ports) following the end of the Brexit transition period.

The seasonally adjusted *IHS Markit/CIPS PMI* fell to a three-month low of 54.1 in January, down from December's three-year high of 57.5. Manufacturing output increased for the eighth successive month in January. However, the rate of expansion slowed to its joint-weakest during that sequence, as total new order intakes fell slightly due to lower intakes of new export business. Companies reported that the national lockdown, end of the Brexit transition period, client closures and renewed uncertainty at the start of the year all contributed to the decrease in new orders. There were also reports of EU-based clients having already brought forward purchasing to avoid expected disruption.

The hope is that the current constraints will start to ease once COVID-19 restrictions are lifted, vaccines are



PMI Data for Selected European Countries

rolled out and ports, suppliers and manufacturers adapt to the new trading environment post-Brexit. If so, supply, demand and production bottlenecks should slowly work through the system and growth will not be knocked too far-off course through 2021. However, there is no swift end in sight to these headwinds, and the longer the current circumstances remain the greater the potential damage to the sector and its suppliers.

## Mergers & Acquisitions

- **Sensata**, a leading industrial technology company that develops sensors and sensor-based solutions has acquired 75% of the Danish company **Lithium Balance**. Lithium Balance is leading technology provider for battery management systems (BMS) which is critical for the performance in applications utilizing Lithium-ion battery-based solutions. With this transaction, Lithium Balance will become an integral part of Sensata and will leverage Sensata's channels and customer relationships in the mobile and stationary clean energy markets where the demand for battery technology is growing rapidly due to the transition from fossil fuels to clean, renewable energy.

- The **Danfoss Group** has announced the full acquisition of **Artemis Intelligent Power Ltd (AIP)**, an R&D and engineering company based in Edinburgh, Scotland specializing in hydraulic system development. The acquisition is a crucial component of Danfoss' plans to roll out its innovative Digital Displacement® technology worldwide. Danfoss previously announced the acquisition of the majority shares of AIP in October 2018, at that time creating a joint venture with Mitsubishi Heavy Industries (MHI) with Danfoss serving as the majority shareholder. Approximately 60 employees will join Danfoss' Digital Displacement team effective immediately. The AIP brand will be formally retired, with all products now branded in the

marketplace as Danfoss Digital Displacement.

- The Italian company **Itaca Finance SA**, a company controlled by **Alpha Private Equity**, reached late last year an agreement for the sale of 100% of **Savio Group** to **Vandewiele**, a Belgian global leading group active in the construction and installation of textile machinery. The completion of the transaction is expected in spring 2021. Financial terms of the transaction are not disclosed. Founded in 1911 and headquartered in Pordenone (Italy), Savio Group is the world leading designer and manufacturer of winding machines and quality control devices for the textile industry, with operations in Italy, China, India, Belgium, Germany and Switzerland. The company is also the parent company for the Italian EMS provider **Eutron**. In 2019, Savio reported consolidated revenues of Euro 270 million. Founded in 1880 in Kortrijk, Belgium Vandewiele is a world leader in mechatronics solutions (combination of mechanical and electronics engineering) to serve textile and electronics customers around the world. The relentless focus on innovation and long-term vision will allow further growth for both companies in the new digital age. Vandewiele reported 2019 revenues of Euro 370 million with over 3,000 employees. Its major plants are located in Belgium, China, Italy, France, Sweden and Germany. The transaction aims at strengthening Savio's international and industrial development, exploiting significant synergies, both from a commercial and operational standpoint.

## Automotive

### EU new passenger car registrations down 23.7% in 2020

In December 2020, demand for new passenger cars in the European Union declined by 3.3% to 1,031,070 units. The four largest EU markets, however, recorded

very different results. Italy and France both suffered double-digit losses, with car registrations down 14.9% and 11.8% respectively, in the last month of the year. By contrast, Germany posted a solid gain (+9.9%) and Spain's performance remained stable, as the number of registrations was more or less the same as in December 2019.

Containment measures – including full-scale lockdowns and other restrictions throughout the year – had an unprecedented impact on car sales across the European Union in 2020, with the biggest yearly drop in car demand since records began. For the year as a whole, new-car registrations fell by 3 million units, or by 23.7%, compared to 2019 to 9.9 million units. All 27 EU markets recorded double-digit declines throughout 2020. Among the region's biggest car markets, Spain posted the sharpest drop (-32.3%), followed closely by Italy (-27.9%) and France (-25.5%), while full-year losses were significant but less pronounced in Germany (-19.1%).

The UK new car market fell by 29.4% in 2020, with annual registrations dropping to 1,631,064 units, according to figures released by the SMMT. A 0.9% decline in December wrapped up a turbulent 12 months, which saw demand fall by 680,076 units to the lowest level of registrations since 1992.

### **SK Innovation announces major battery investment in Hungary**

The South Korean company SK Innovation, one of the world's leading battery manufacturers, has announced a greenfield investment of US\$2.29 billion to establish the company's largest European factory in Iváncsa, Hungary.

In addition to their two factories in Komárom, the annual capacity of the production base to be launched third will be 30GWh, creating 2,500 new jobs and enabling the production of 430,000 electric cars per year. Construction starts at the end of 2021.

### **HELLA expands operations in Lithuania**

The German automotive systems and components group HELLA has announced it will invest more than Euro 2 million at its manufacturing operations in Lithuania to support the production of fuel control modules.

The investment includes new production facilities, raw material production technologies, product development and industrialization.

### **Kitron awarded F-35 IF receiver order**

Kitron has received an order from Northrop Grumman for production of a sub-assembly for the F-35 fighter aircraft radar system developed by Northrop Grumman. The intermediate frequency (IF) receiver was awarded under a best value competition and covers production lot 15. The value of the order is NOK 10 million.

This order is the first award under the long-term supply agreement announced 31 March 2016 with a value of NOK 500 million over the expected lifetime of the program. This achievement was made possible due to the strong capabilities from the Kitron prototyping and development team, confirming that Kitron has the capacity to support complex high-level assemblies. To be qualified for this production lot, Kitron developed advanced test equipment. Kitron expect the lot 15 production award is the first of many future lots to be manufactured at Kitron and that it positions us as a supplier for the Joint Strike Fighter program.

Norway is one of the international partner countries participating in the F-35 program. Under the Manufacturing License Agreement between Kitron ASA and Northrop Grumman, Kitron will manufacture and repair several subassemblies for the F-35 Joint Strike Fighter.

### **NOTE announces new medtech order**

The Swedish EMS provider NOTE has begun cooperation in electronics manufacturing with a well-established large international medtech company, a leader in its field. Batch production will begin during the first half of 2021 at NOTE's plant in Estonia. The potential in the collaboration is significant and sales are estimated to amount to approximately SEK 85 million on an annual basis. The conditions are good that the collaboration will develop into NOTE's largest in medtech.

### **Custom Interconnect installs second TAKAYA APT-1400F flying probe tester**

The UK EMS provider Custom Interconnect Ltd has invested in another TAKAYA APT-1400F Flying Probe Test machine from Accelonix Ltd to compliment the first TAKAYA APT-1400F that they installed in late 2018. This second system will further enhance CIL's capacity and its technical capability to test 0201 based electronic assemblies which make up the majority of its manufacturing.

The APT-1400F is the very latest machine from TAKAYA and is complete with 4 tilted contact probes, 2 vertical

contact probes, and 2 IC-open check probes. The APT-1400F system also has a powerful optical recognition system for reliable and precise automatic optical testing.

CIL has also recently added to the capability of its existing "Test Expert" software package to include "CoverageXpert" option for machine generated test reports.

To reliably produce 0201 based products, CIL has also invested in 3 - DEK Horizon 03iX Solder printers complete with 100% "Hawkeye" print inspection; 3 - MYCRONIC MY300 SMT placement machines; 2 - Koh Young Zenith2 3D Automatic Optical Inspection (AOI) with 15um cameras; 2 - Automatic conveyor systems for 3D AOI systems; 1 - DAGE QUADRA 5 X-Ray / CT Scan Inspection system; 1 - LPKF 2110P Laser PCB depaneler system; and 1 - ASSCON 6000 Vacuum Assisted Vapour Phase Reflow system.

### **USI enters the global EV powertrain system supply chain**

The Chinese headquartered EMS provider USI has announced plans to penetrate the supply chain of EV powertrain systems. By introducing the automotive functional safety standard ISO26262 and being certified with Chapters II and VII for manufacturing, USI has been well-recognized by OEMs and tier-I suppliers in the past few years. The production of the EV powertrain system and the thermal system will be started in 2021.

After acquiring Asteelflash, the second largest EMS manufacturer in Europe in December 2020, USI now runs 27 production bases across Europe, the Americas, Asia, and Africa and is capable of meeting OEMs and tier-I suppliers' local supply requirements to create more value for customers.

### **HansaMatrix opens new manufacturing plant in Ventspils**

Latvian EMS provider HansaMatrix will begin operations at a second plant in Ventspils, according to the manufacturing campus development plan.

The Company has signed 10-year lease agreement with Freeport of Ventspils authority to lease the newly constructed manufacturing building with total area of 4,600 sq m, located at Ventspils augsto tehnoloģiju parks No.7, Ventspils.

The new plant will complement existing manufacturing capacity with new integrated manufacturing process in plastic parts production and final product assembly, containing optical elements and systems. It will double the box build assembly capacity available in Ventspils manufacturing site.

### **Inission Malmö signs agreement with VibroSense Dynamics AB**

VibroSense Dynamics AB has signed a production agreement with Inission Malmö, a subsidiary of the Swedish EMS provider Inission. The agreement pertains to turnkey production of the company's instrument VibroSense Meter® II as well as the purchase of materials and components.

VibroSense Dynamics AB develops and sells medical technology products and services for diagnostic support for nerve injuries in the hands and feet. The company's customers are diabetes clinics, occupational health care, hospitals, health centres and researchers.

### **VIDEOTON looks to expand presence in medical market**

Following the qualification of the Kaposvár-located VIDEOTON Elektro-PLAST Kft. in 2016, the Székesfehérvár-based VT ES Kft. – dealing with the assembly of final products, low to medium volume sheet metal part manufacturing and powder coating, as well as the development and distribution of Automated Identification technology systems – received the ISO 13485 qualification at the beginning of 2021. By obtaining this certification VT ES Kft., a part of the Hungarian EMS provider VIDEOTON, is looking to establish a stronger presence in the medical market.

The company, which is mainly engaged in final assembly and plastic injection moulding, will launch another project in 2021 in the field of manufacturing plastic parts for the control device of surgical robots.

### **BMK SMETA audited**

The German EMS provider BMK has successfully passed the Sedex Members Ethical Trade Audit (SMETA). With this, TÜV Süd confirms the Augsburg-based electronics service provider (EMS), BMK acts in an ethical business manner.

SMETA, the Sedex Members Ethical Trade Audit, is a globally recognized audit procedure for sustainable and ethical conduct in business relationships, developed by the British non-profit organization Sedex Associate Auditor Group. It helps minimize risks by promoting transparency throughout the supply chain.

Proof of a supply chain managed according to social standards is becoming increasingly important for international organizations. Corresponding legislation is to be expected or will be tightened.

## Selha gains CIR approval through to 2022

The French EMS provider Selha has announced that the French Ministry of Higher Education, Research and Innovation has granted the company's design office in Eu, France CIR (Research Tax Credit (CIR) approval for the years 2020, 2021 and 2022.

With the approval, customers will be able to benefit from a CIR of 30% for the design, production of prototypes and pilot installations of new products developed at the Eu design centre.

## EMS financial round up

- **Flex's** net revenue for the third quarter of fiscal 2021 were US\$6,720 million up from US\$6,461 million in the same period a year earlier. Flex Reliability Solutions reported revenue of US\$2,886 million up 2% YoY and 8% sequentially. For Health Solutions Flex continued to fulfil COVID-related critical care demand while ramping new programs. Automotive posted a strong recovery while growth in core Industrial was offset by temporary power solutions headwinds. Revenue for Flex Agility Solutions was up 6% YoY and 14% sequentially at US\$3,834 million. Communications, Enterprise & Cloud (CEC) benefited from 5G product roll outs and investment in critical infrastructure supporting work and learning from home applications. Lifestyle reported sustained home-based demand and seasonality while Consumer Devices saw a further recovery in emerging markets. For the final quarter of Fiscal 2021 the company expects revenues of US\$5,600 million to US\$6,000 million with Flex Reliability Solutions up low to high-single-digits and Flex Agility Solutions up low to high-single-digits. Within Flex Agility Solutions the outlook for Lifestyle is for stable demand for premium durable goods offset by typical seasonality, for CEC sustained strength in 5G and critical infrastructure products while enterprise IT spending will remain soft while Consumer Devices will benefit from steady demand and typical seasonality in emerging markets while monitoring potential supply chain disruptions. Within Flex Reliability Solutions within automotive the company expects a further recovery from the COVID-19 trough although again the company is closely monitoring developments in the supply chain. In Health Solutions critical care demand remains strong while elective procedure volumes are still down due to elevated COVID infection rates. Flex expects strong growth in industrial driven by core industrial and power businesses.

- For the final quarter of 2020, **Celestica** reported revenues of US\$1,386.6 million, a decline of 7.0% compared to the US\$1,491.7 million reported in the same period a year earlier. ATS segment revenue declined by 12.4% in Q4 2020 compared to Q4 2019

to US\$513.2 million (Q4 2019: US\$585.7 million), primarily driven by adverse demand impacts related to COVID-19. Demand from the semiconductor capital equipment customers improved in Q4 2020 compared to Q4 2019, and the company expects demand to remain strong in 2021. Celestica also anticipates that demand will pick-up towards the end of 2021 in its display business. Within aerospace and defence, demand in the defence business remained stable in Q4 2020, while the company continued to experience demand reductions in the commercial aerospace business as a result of COVID-19. Celestica expect weakness in the commercial aviation industry due to COVID-19 to persist throughout 2021. Although demand in the industrial business in Q4 2020 compared to Q4 2019 was adversely impacted by COVID-19, there has been a gradual recovery of demand across the customer base since the second quarter of 2020. The health tech business continued to benefit from demand strength, reflected in new program ramps in Q4 2020, attributable in part to new program wins to support the fight against COVID-19. CCS segment revenue decreased by 3.6% in Q4 2020 compared to Q4 2019 to US\$873.4 million (Q4 2019: US\$906.0 million), primarily as a result of the disengagement from programs with Cisco Systems, which was completed at the end of 2020 as planned. This decline was offset in large part by strong demand from service providers in the communications end market. The CCS Joint Design & Manufacturing (JDM) business (which has been renamed Hardware Platform Solutions, experienced strong demand, up 53% in Q4 2020 compared to Q4 2019 driven by Hyperscaler demand strength. For the full year, Celestica reported sales of US\$5,748.1 million down from US\$5,888.3 million in 2019, growth in the CCS segment (2020: US\$3,661.8 million/US\$3,602.7 million) offset by an 8.7% decline in ATS revenues (2020: US\$2,086.3 million/2019: US\$2,285.6 million). For the first quarter of 2021 the company expects sales of between US\$1,175 million and US\$1,275 million.

- The US EMS provider **Plexus** has reported fiscal 2021 first quarter revenue of US\$830 million and compared to US\$913 million the prior quarter and the US\$852 million reported in the first quarter of fiscal 2020. During the quarter, Plexus won 35 new programmes in its Manufacturing Solutions group. The company anticipates these wins will generate approximately US\$223 million in annualized revenue when fully ramped into production. By area the Americas accounted for US\$89 million of the manufacturing wins during the quarter, Asia Pacific US\$93 million and Europe, Middle East and Africa US\$41 million. By market sector Industrial accounted for US\$108 million of the manufacturing wins during the quarter, Healthcare/Life Sciences US\$81 million, and Aerospace and Defence US\$34 million. By market sector Healthcare/Life Sciences represented US\$319 million

(Q4 Fiscal 2020: US\$345 million/Q1 Fiscal 2020: US\$312 million); Industrial US\$378 million (Q4 Fiscal 2020: US\$427 million/Q1 Fiscal 2020: US\$368 million); and Aerospace & Defence US\$133 million (Q4 Fiscal 2020: US\$141 million/Q1 Fiscal 2020: US\$172 million). Geographically the Americas accounted for US\$327 million of sales before eliminations in the first quarter of fiscal 2021 (Q4 Fiscal 2020: US\$334 million/Q1 Fiscal 2020: US\$353 million), Asia Pacific US\$451 million (Q4 Fiscal 2020: US\$503 million/Q1 Fiscal 2020: US\$451 million) and EMEA US\$79 million (Q4 Fiscal 2020: US\$99 million/Q1 Fiscal 2020: US\$85 million). The top 10 customers comprised 55% of sales the quarter, one percentage points lower than the final quarter of fiscal 2020.

- The spread of covid-19 resulted in a clear demand slowdown across several sectors and regions. However, overall demand for the Swedish EMS provider **NOTE's** services progressed positively in the year. Sales increased by 6% to SEK 1,874 million (2019: SEK 1,760 million). Growth was wholly organic, and the impact of altered exchange rates, mainly US dollar and euro, was negative at about 1%. Demand in Sweden and Finland was very strong in the year, especially from industrial and medtech customers. Extensive restrictions and shutdowns across UK industry due to the pandemic contributed to sales in the UK reducing by 20%, which was a contributor to restricting sales growth in Western Europe to 13%. Sales from the Estonian plant, which are mainly to northern European customers, made positive progress during the year. Growth was 7% primarily because of intensified customer partnerships across industry, and the start-up of several new customer assignments. Sales from the plant in China are to local and global customers. The extended production stoppage in Q1, and safety measures **NOTE's** healthy growth in Western Europe should be viewed against the background of a rapidly changing market. Previously, manufacturers were very keen to locate electronics manufacture in Asia. Accentuated by increasing restrictions to global trade, a sharper focus on sustainability issues, and not least the current pandemic, there is a clear trend for customers increasingly demanding development and manufacturing services closer to home. **NOTE's** 15 largest customers in sales terms represented 47% of group sales (2019: 45%). No single customer (group) represented more than about 6% of total sales (2019: 6%). The group's order backlog, which is a combination of fixed orders and customer forecasts, progressed positively. At year end, the order backlog was some 20% (2019: 25%) above the previous year's level. Overall, sales in Q4 were down by 4% to SEK 466 million (Q4 2019: SEK 483 million. Adjusted for currency effects, primarily appreciation of the SEK against the euro and US dollar, sales were at the same level as the previous year. Continued high demand was apparent in Sweden, from new and established

customers, and especially from engineering industry customers. Accordingly, Sweden sustained its record level, with growth of 16%. But market conditions in the UK remained poor, due to shutdowns across several industries. Sales in the UK were about 20% below the previous year's level. As a result, growth in Western Europe was limited to 6% in the fourth quarter. Sales from the plant in Estonia performed strongly in the year. However, a significant decline in project deliveries in the telecom segment was apparent in the fourth quarter. Volumes in China increased notably at the end of the period, but sales in the fourth quarter were down by 14% on the previous year.

## Production

### Wingcopter raises US\$22 million

Wingcopter, the German developer, manufacturer and operator of unmanned delivery drones for commercial and humanitarian applications, has secured US\$22 million in Series A funding.

Wingcopter will use the funds to strengthen its leadership in drone-based logistics, with a special focus on healthcare-related applications, including the distribution of COVID-19 vaccines. At the same time, Wingcopter is well-positioned and ready to establish more partnerships worldwide around other fully automated delivery applications.

The financing round was led by Silicon Valley-based Xplorer Capital, a key investor in autonomous technologies, and Futury Regio Growth Fund, a Germany-based growth capital fund focusing on investments in globally scalable business models. In addition, Futury Ventures and Hessen Kapital III participated in this financing round.

A portion of the new capital is allocated to setting up a partially automated serial production at Wingcopter's new headquarters in Weiterstadt, Germany, already home to more than 100 employees. The 7,200 sq m site allows for a swift ramp up to mass production to meet a constantly growing global demand.

### Rockley Photonics closes additional US\$65 million funding

UK-based Rockley Photonics, a leading integrated optics solutions provider, has announced that it has closed an additional US\$65 million round of growth capital from both new private funds and follow-on existing investor Morningside Ventures.

To date, Rockley has raised over US\$290 million of financing to develop its silicon photonics platform from recent investors such as Credit Suisse backed SIG-I Capital and Applied Ventures LLC, the venture capital arm of Applied Materials, Inc.

The latest funding provides the resources for Rockley to accelerate its product offerings, particularly for its integrated optical sensors products.

### **Oqton raises US\$40 million Series A financing round**

Oqton, Inc., the US and Belgium-based software company specialising in AI-powered solutions for the manufacturing industry, has announced that it has raised over US\$40 million in a Series A financing round, led by Fortino Capital, a leading B2B software investor, by PMV, the regional Flemish investment fund, and by Sandvik, a global engineering group. The financing will be used to further develop its platform, while expanding its commercial partnerships in multiple domains and verticals (Additive manufacturing, Robotic welding, CNC machining).

Oqton's platform is unique in that it combines several manufacturing software capabilities (CAD, PLM, CAM, IOT, MES, QMS) into a single platform, enabling an unprecedented degree of AI-powered automation and optimization. Users can automatically capture expert knowledge and eliminate repetitive tasks, access technologies remotely and across multiple sites, and optimize production planning to improve utilization and quality.

### **£85 million for UK electric aircraft projects**

ZeroAvia, GKN Aerospace and Blue Bear are to share £85 million to develop hydrogen technologies for electric aircraft. Half the funding comes from the UK government's ATI programme and matched by industry.

GKN Aerospace-led project H2GEAR will receive a £27.2 million grant over five years to develop a liquid hydrogen propulsion system for regional air travel, which could be scaled up for larger aircraft and longer journeys.

ZeroAvia's HyFlyer II will receive a £12.3 million grant to scale up its zero-emissions engines for demonstration on a 19-seater aircraft, showcasing its significant technological advances, meaning that customers can expect to fly on zero-emissions aircraft as early as the end of 2023.

InCEPTion, led by Blue Bear Systems Research, is receiving a £2.8 million government grant to develop a fully-electrified zero-emissions propulsion capable of powering a range of electric aircraft including unmanned drones and passenger aircraft.

The InCEPTion (Integrated Flight Control, Energy Storage and Propulsion Technologies for Electric

Aircraft) project would enable a broad range of new mobility services across the UK, from large cargo delivery to regional commuting.

The project includes Drive System Design, Ricardo, materials specialists, M&I Materials and the University of Cambridge's Whittle Laboratory as well as the University of Salford's Acoustics Research Centre.

### **EU approves Euro 2.9 billion to support European battery ecosystem**

The European Commission has approved, under EU State aid rules, a second Important Project of Common European Interest ("IPCEI") to support research and innovation in the battery value chain.

The project, called "European Battery Innovation" was jointly prepared and notified by Austria, Belgium, Croatia, Finland, France, Germany, Greece, Italy, Poland, Slovakia, Spain and Sweden.

The twelve Member States will provide up to Euro 2.9 billion in funding in the coming years. The public funding is expected to unlock an additional Euro 9 billion in private investments. The project complements the first IPCEI in the battery value chain that Commission approved in December 2019.

### **Siemens and Cybord bring electronic component authenticity validation to electronics manufacturing**

The Israeli-based company Cybord, a leader in electronic component authenticity detection technology, has been selected to participate in Siemens Dynamo, an open innovation program from Siemens Digital Industries Software in Israel. The Dynamo program brings manufacturing innovation from emerging companies to Siemens' customers and partners. Selected companies work closely with Siemens' relevant experts to develop a joint commercial offering within a 12-month timeframe.

Cybord's electronic component provenance technology detects counterfeit, damaged and tampered electronic components right on the SMT assembly line by visually inspecting each component before it gets assembled. Using existing SMT machines' cameras, artificial intelligence and big data, Cybord's inspection technology requires no additional hardware. The technology helps electronics OEMs build higher quality products that are free of hardware-based cyber-attacks and provides a new level of visibility and traceability into the supply chain.

Earlier in January, Cybord was awarded a significant budget by Israel's Innovation Authority (IIA) to support

its collaboration with Siemens. Cybord is the first Israeli start-up to take advantage of Siemens' Multinational Collaboration program with the IIA, signed in 2019. This program is designed for ready-to-market technologies, that with the support of both the IIA and the Multinational Corporate involved, can accelerate the market validation phase, especially outside Israel.

### **STMicroelectronics joins ZETA alliance**

STMicroelectronics has joined the ZETA Alliance, the industry body promoting ZETA Low-Power Wide Area Network (LPWAN) technology for low-cost long-range IoT connectivity.

ZETA technology is quickly becoming established throughout China, Japan, and beyond, bringing together innovative wireless technologies that enable low-power, low-cost devices to rely on robust connections over extended distances. In addition, native support for mesh networking, which allows peer-to-peer communication among the network nodes, boosts network coverage and resilience.

Joining the Alliance as a Promoter member, ST expects ZETA technology to further accelerate the spread of IoT in all territories worldwide. The standard lets developers create high-value IoT-based solutions to challenges that face extreme cost constraints.

### **Airbus updates production plans**

Airbus has announced new production rates in response to the current market environment.

The new average production rates for the A320 Family will now lead to a gradual increase in production from the current rate of 40 per month to 43 in Q3 and 45 in Q4 2021. This latest production plan represents a slower ramp up than the previously anticipated 47 aircraft per month from July.

The A220 monthly production rate will increase from four to five aircraft per month from the end of Q1 2021 as previously foreseen.

Widebody production is expected to remain stable at current levels, with monthly production rates of around five and two for the A350 and A330, respectively. This decision postpones a potential rate increase for the A350 to a later stage.

Airbus continues to monitor the market closely. With these revised rates, Airbus preserves its ability to meet customer demand while protecting its ability to further adapt as the global market evolves. Airbus expects the commercial aircraft market to return to pre-COVID levels by 2023 to 2025.

In 2020, Airbus delivered 566 commercial aircraft, a decline of 34% from the 863 delivered in 2019.

### **Saab proposes new Saab sensor centre in Canada**

Saab has announced that it has offered to establish a new facility in Canada as part of its offer for Canada's Future Fighter Capability Project (FFCP). This would be known as the Saab Sensor Centre and would be located in Vancouver, British Columbia, with a focus on sensor technologies such as radar.

One of the proposed projects is to develop a Space Surveillance Radar (SSR) in Canada, in co-operation with other companies within the Canadian space industry. It is envisaged that this surface radar will target the global market for greater awareness of objects in the Earth's orbit.

### **TT Electronics and Thales sign collaboration**

TT Electronics, a global provider of engineered electronics for performance critical applications, has announced a collaboration agreement with Thales to enable future development of operational technology (OT) based cyber security initiatives and research. These programs will be delivered out of the National Digital Exploitation Centre (NDEC) in Ebbw Vale, South Wales – a project cofounded by the Welsh Government, Thales and University of South Wales. The NDEC is a cornerstone of the Welsh Government's Tech Valleys initiative, which offers cyber skills and knowledge to South Wales.

This collaboration brings together Thales' expertise in securing critical systems with TT Electronics' innovative approach to electronics manufacturing for high-reliability markets. The partnership will allow the companies to work hand in hand on developing a complete cyber security journey, from operational technology asset discovery within TT Electronics' Factories, to the implementation of a Security Operations Centre (SOC) and development of future products for TT.

The first project within the agreement has already been undertaken, with Thales helping TT deploy advanced new technologies and software across its production facilities to ensure protection from cyber threats of today and tomorrow.

### **Henkel invests in technology start-up Feelit**

Henkel Adhesive Technologies has strengthened its capabilities for maintenance, repair and overhaul (MRO)



solutions by investing in Feelit, Haifa, Israel. The start-up has developed a unique sensor technology for predictive maintenance for various applications in manufacturing. With the investment Henkel aims to further expand its leading MRO portfolio for its broad customer base in industrial markets.

Henkel Adhesive Technologies is a leading provider of MRO solutions in more than 800 different industry segments. Adhesives and sealants under the well-known Loctite brand improve the maintenance of production machinery and equipment for example in steel mills, car factories, mining equipment or power turbines around the globe. The products are designed to help manufacturers limiting cost-intensive unplanned production line stops.

Founded in 2017, Feelit has developed a highly sensitive, flexible, printed nanomaterial sensor that is applicable on static and rotating machinery parts. This sensor can measure strain in ultra-high resolution, as well as other parameters such as temperature, vibration, and pressure. Based on an industrial IoT platform for real-time remote sensing of structural changes in mechanical assets, the system serves as an 'electronic skin' that alerts on critical structural and operational anomalies in advance. With a 50 times higher sensitivity compared to current standard market applications it allows condition monitoring and predictive maintenance of industrial assets, like valves, pipes and pumps, and prevents unplanned and cost intense downtimes of machineries.

### **Sintecs to establish R&D centre in Lithuania**

The Dutch electronics design company Sintecs has announced plans to open a R&D base in Vilnius, Lithuania. The company is looking to hire a developed engineering team that would allow delivering complex technical projects using in-house capacity.

### **EIB signs Euro 100 million loan agreement with Valmet**

The European Investment Bank (EIB) has signed a Euro 100 million loan agreement with Valmet, a Finnish developer and supplier of technologies, automation and services for the pulp, paper and energy industries. The financing will support Valmet's R&D response to important global trends, ranging from enhancing raw materials efficiency to efficiency in the use of water and energy, as well as using renewable raw materials and reducing Valmet's customers' emissions. The supported R&D will be carried out in Valmet's locations in Finland and Sweden.

## **Semiconductors**

### **Newport Wafer Fab looks for funding to support capacity expansion**

Newport Wafer Fab, which was formed in 2017 following the sale of the former International Rectifier facility by Infineon, is reportedly talking to private equity and venture capital funds to fund an expansion of the site. The current 200mm fab has the capacity for 32,000 wafers per month but has the capability to increase this to 44,000.

### **Top-10 IC growth categories in 2021**

According to *IC Insights*, each of the top-10 growing IC product categories is expected to see a double-digit increase in sales, but only the top-five segments are forecast to grow faster than the total IC market, which *IC Insights* projects will rise 12% this year.

DRAM and NAND flash are expected to be the two fastest-growing product segments in 2021 with 18% and 17% sales growth, respectively. Laying claim as the fastest growing IC product segment is familiar territory for the DRAM market. DRAM was also ranked as the fastest-growing IC segment in 2013, 2014, 2017, and 2018. On the other hand, due to its extreme cyclicity, DRAM has also been among the poorest performing categories. Collapsing prices resulted in the DRAM market falling -37% in 2019, ranking its growth rate last among the 33 IC product categories that year.

An increase in laptop, tablet, and server system sales boosted NAND revenue 24% in 2020 as the Covid 19 pandemic forced a transformation in the way consumers, schools, businesses, and governments communicated and carried on with their business. The transition to 5G technology within many of these same computing applications and smartphones is forecast to boost NAND revenue growth 17% in 2021.

Two automotive specific IC product categories, Automotive—Application-Specific Analog and Automotive—Special Purpose Logic are forecast to be among the fastest growing segments in 2021. New car sales took a hit during Covid-plagued 2020, which adversely impacted automotive IC sales. But demand for automobiles picked up in early 2021, leading to shortages of many automotive IC products. Additional electronic systems/features, onboard connectivity, advances in autonomous driving, and the expansion of electronic vehicle sales around the world are expected to help raise the average semiconductor content per new vehicle to more than US\$550 in 2021.

With smartphone growth slowing in recent years, many system-on-chip MPU suppliers such as Qualcomm,

## Top-Growing IC Markets 2019-2021F (\$)

Rank	2019		2020		2021F	
1	Industrial/Other—Spcl Purp Logic	37%	Wireless Comm—Spcl Purp Logic	28%	DRAM	18%
2	Standard Cell	17%	Computer and Periph—Spcl Purp Logic	26%	NAND Flash	17%
3	Auto—Spcl Purp Logic	16%	Cellphone Application MPUs	24%	Auto—App-Specific Analog	16%
4	Embedded MPUs	9%	NAND Flash	24%	Auto—Spcl Purp Logic	16%
5	Display Drivers	8%	Wired Comm—Spcl Purp Analog	18%	Embedded MPUs	15%
6	PLDs	5%	Display Drivers	10%	Display Drivers	11%
7	—	-	Industrial/Other—Spcl Purp Logic	10%	Wired Comm—App-Specific Analog	11%
8	—	-	Wired Comm—Spcl Purp Logic	10%	32-bit MCU	10%
9	—	-	Automotive—Spcl Purp Logic	9%	Computer and Periph—Spcl Purp Logic	10%
10	—	-	—	-	Wireless Comm—Spcl Purp Logic	10%

Source: IC Insights

Rankings apply to IC product categories with more than \$100M in annual sales.

Samsung, and MediaTek, have turned more of their attention to 64-bit embedded processors that integrate security features and machine-learning AI acceleration along with graphics and video capabilities for automated vehicles, self-flying drones, and IoT applications. A number of system trends are driving embedded processor growth including increased automation in vehicles, industrial equipment, and home products. Internet connections are also becoming pervasive in systems. In a growing number of applications, embedded processors are handling machine-learning AI capabilities for autonomous operations without the need of intervention or control by humans.

The 32-bit MCU market has expanded rapidly because of increasing demands for higher levels of precision in embedded systems and the rush to connect sensors along with nearly everything else to the Internet of Things. Many new 32-bit MCU designs support wireless connections and Internet protocol (IP) communications. In automobiles, 32-bit MCU demand

is being driven by "intelligent" onboard systems and increases in real-time sensor functions that are serving a growing number of automated safety features like electronic stability control (ESC) and crash-avoidance capabilities. Meanwhile, a growing wave of 32-bit microcontrollers are being used in a wide range of consumer and industrial equipment applications as IC suppliers introduce powerful MCU designs that cost nearly the same as 8-bit and 16-bit devices in consumer electronics and other high-volume systems.

### Worldwide semiconductor revenue grew 7.3% in 2020

Following a decline of 12% in 2019, worldwide semiconductor revenue rebounded in 2020 to total US\$449.8 billion, an increase of 7.3% from 2019, according to preliminary results by *Gartner, Inc.* In early 2020, the expectation was that COVID-19 would have a negative impact across all end equipment markets, but the actual effect was more

### Top 10 Semiconductor Vendors by Revenue, Worldwide, 2020 (Millions of US Dollars)

2020 Rank	2019 Rank	Vendor	2020 Revenue	2020 Market Share (%)	2019 Revenue	2019-2020 Growth (%)
1	1	Intel	70,244	15.6	67,754	3.7
2	2	Samsung Electronics	56,197	12.5	52,191	7.7
3	3	SK hynix	25,271	5.6	22,297	13.3
4	4	Micron Technology	22,098	4.9	20,254	9.1
5	6	Qualcomm	17,906	4.0	13,613	31.5
6	5	Broadcom	15,695	3.5	15,322	2.4
7	7	Texas Instruments	13,074	2.9	13,364	-2.2
8	13	MediaTek	11,008	2.4	7,959	38.3
9	14	KIOXIA	10,208	2.3	7,827	30.4
10	16	Nvidia	10,095	2.2	7,331	37.7
		Other	198,042	44.0	191,236	3.6
		Total Market	449,838	100.0	419,148	7.3

Source: Gartner (January 2021)

nuanced. Automotive, industrial and some areas of the consumer market were hit hard by reduced enterprise and consumer spending. However, lockdowns vastly increased work from home and e-learning, and any markets that facilitated those activities benefited.

Server demand was strong as hyperscale customers, which in 2020 accounted for over 65% of server demand, rushed to add capacity to cope with extra demand during lockdowns in the first half of 2020. Additionally, strong demand for PCs from enterprises and consumers due to increased work and study from home led to strong growth in CPUs, NAND flash and DRAM.

Intel retained its position as the No. 1 global semiconductor vendor by revenue in 2020, followed by Samsung Electronics, SK hynix and Micron. Intel's semiconductor revenue grew 3.7%, driven by growth of its core client and server CPU businesses. Despite a slowdown in the overall smartphone market, strong sales of 5G smartphones helped propel semiconductor companies, such as Qualcomm and MediaTek, to strong growth in 2020. The growth of 5G is offsetting the weaker system unit growth with increased semiconductor dollar content, including higher-ASP 5G chipsets and additional RF front-end components and power management ICs.

## Renewable Energy/Cleantech

### Strong growth forecast for renewable energy, green hydrogen

A strong rebound of renewable installations, a continued surge in green hydrogen growth and a focus on recycling will be among the key themes in the Clean Technology space in 2021, according to a new report from *IHS Markit*.

- *Renewable installations will rebound by double-digits after covid-19 impasse*

Annual solar installations are predicted to grow by over 30% in 2021 after volatile demand in 2020, triggered by the covid-19 pandemic. Although global installation numbers increasingly de-link from reliance on the Chinese market, China will still account for 35% of global annual installations in 2021. There are now 18 markets globally that have +1GW cumulative solar installations, compared to just six a decade earlier.

This strong market demand comes despite an increase in production costs (up 10–15%) driving a historic surge in module prices, especially in the first quarter. However, production costs are set to drop in the second half of the year, lowering module prices and laying the ground for record solar installations at the end of 2021.

2020 was a record year for wind with IHS Markit tracking activity of nearly 120 GW. Of this, nearly 60% was from mainland China including projects that have secured subsidy entitlement. Annual onshore wind installations in 2021 will continue to be derived from installation rushes in markets facing imminent subsidy cuts including the US and mainland China.

Non-mainstream renewables such as geothermal will continue generating increasing attention from conventional energy companies and investors - nearly 0.5GW of new capacity is expected to be commissioned throughout 2021, with Indonesia and Kenya leading the global market.

- *Rapid solar technology innovation continues despite shrinking PV system costs*

Spain, India and the Middle East region will continue to be the markets with the lowest solar levelized cost of electricity (LCOE). IHS Markit projects photovoltaic (PV) systems capex to continue declining in 2021 by 5% year on year, largely driven by decreasing component prices. Meanwhile, average module efficiency records continue to increase, surpassing 22.5% in PERC monocrystalline cell commercial production and are forecast to reach 24% by 2022.

Perovskites technologies, a promising solar cell technology development with significant potential to increase cell efficiencies and reduce costs, is set to continue breaking efficiency records, but the technology will only be mature for commercial production in the next five years.

- *Offshore wind annual installations to surpass the 10 GW threshold*

In 2021 the offshore wind industry will deploy more than 10 GW of capacity, nearly twice as much as last year, driven by the boom in installations in China.

Capacity tenders will also burgeon this year with over 20 GW worth of capacity to be auctioned in the UK, France, Denmark, Netherlands, Germany, the US, Japan and Taiwan.

Oil and gas majors will further accelerate growth in the offshore wind market as they aim to leverage technical and project management skills to increase their footprint in the renewables space.

- *Low carbon hydrogen projects enjoy exponential growth*

The exponential growth in the electrolysis project pipeline in 2020 and the unprecedented interest around hydrogen as a decarbonization tool has been driven by a combination of falling costs and rising policy support.

The declining cost of low-carbon hydrogen is anticipated to continue to fall by a further 40% through 2025 due to the falling cost of renewables electricity and the price decline expected in electrolysis technology as it is scaled-up.

- *Recycling becomes a priority for companies and governments globally*

New policies for battery recycling will be led by the automotive industry, spurred on with a sense of urgency due to the shorter life cycle of batteries compared to solar panels and wind turbines and the scale of the EV sector.

Meanwhile, with over 20 GW of the installed onshore wind fleet globally exceeding their 20-year design life in 2021, decisions about repowering, decommissioning, or extending life of existing capacity will play a growing role in mature markets. In the case of Germany, for example, over 6 GW of capacity will end subsidies this year.

### Oxford PV receives funding to support expansion

Solar cell manufacturer Oxford PV is investing Euro 44 million in the expansion of its manufacturing facility in Brandenburg an der Havel, Germany, where the company has been based since the end of 2016. To support the expansion the company has been awarded Euro 8.8 million from the Brandenburg Ministry of Economics, as part of the EU's Regional Development Program,

Activity is ramping up in Oxford PV's Brandenburg facility, with manufacturing of the company's revolutionary solar cells commencing in 2021 ahead of commercial deployment later in the year.

This is the second time that Oxford PV has been awarded a grant as part of the EU's Regional Development Program. It was awarded Euro 3.1 million in 2018 for its low volume production line, to support the transfer of its technology from laboratory to industrial scale equipment and processes.

## Asia Pacific Electronics

### Equipment/Manufacturing

- According to media reports **LG Electronics** is looking to sell off its smartphone business to Vietnam's **Vingroup Co.** Vingroup entered the smartphone business in 2018. It has been producing smartphones under an original design manufacturing (ODM) contract with LG Electronics. Currently, it is the third largest smartphone producer in Vietnam after **Samsung Electronics** and **Oppo**.

- The Swiss-headquartered **maxon** has teamed up with Shanghai start-up **Fourier Intelligence** in a strategic deal for medical exoskeleton technology. Fourier already uses precision brushless BLDC motors from maxon in its ExoMotus X2 exoskeleton. In addition, maxon will become part of the Exoskeleton & Robotics Open Platform System (EXOPS), an open platform for research and development of exoskeleton and robotics systems. maxon will provide a variety of customized drive solutions with motors, gearheads, encoders and controllers to engineers who want to develop robotics solutions for rehabilitation services.

- The Vietnamese government has awarded a license to **Foxconn Technology Co Ltd** to build a US\$270 million plant to produce laptops and tablets in the country. The plant, to be developed by **Fukang Technology**, will be located in the northern province of Bac Giang and will annually produce eight million units, according to a government statement. Separately, state media has also reported last week Foxconn was also looking into investing US\$1.3 billion in Thanh Hoa province, 160 km south of Hanoi.

- Indian EMS provider **Dixon Technologies'** wholly-owned subsidiary **Padget Electronics** has entered into an agreement with **HMD India** for manufacturing Nokia smartphones. The smartphones will be manufactured at Padget's manufacturing facility situated at Noida, Uttar Pradesh. In December 2020, Dixon Technologies announced that Padget Electronics had entered into an agreement with **Motorola Mobility** for manufacturing smartphones.

- The German sensor company **Leuze** has started construction on a new plant in Malacca, Malaysia to meet rising demand from the Asian market. The new plant is scheduled to be completed in the first quarter of 2022. The new production location will operate as Leuze electronic assembly Malaysia Sdn. Bhd. and is a wholly-owned subsidiary of Leuze electronic GmbH + Co. KG. The plant is being constructed on a site area spanning over 17,000 sq m. In an initial expansion phase, approximately 4,500 sq m will be prepared for production and warehouse logistics operations as well as 1,000 sq m for administration. The total usable floor space will be just under 7,000 sq m – of which approximately 2,000 sq m will be used for production. Growth potential exists for a doubling in a second construction phase. Following the initial expansion phase, up to 200 new employees will work in the new Leuze plant in Malacca.

### Automotive

- **BYTON, Foxconn Technology Group** and **Nanjing Development Zone** have officially signed a strategic cooperation framework agreement to jointly accelerate the production of BYTON's first electric passenger car by the first quarter of 2022.

- **Foxconn** and Chinese carmaker **Geely** have created a joint venture aimed at selling manufacturing and services to the global auto industry. Foxconn and Geely will each hold a 50% stake in their joint venture.

- The Taiwanese company **Pegatron** has invested US\$14 million for a 423,195 sq ft industrial site in Mahindra City, India. In the wake of US-China trade tensions, Taiwan-based ODMs have been expanding their capacities outside of China with Pegatron mainly showing interest in investing in Vietnam and India.

### Components

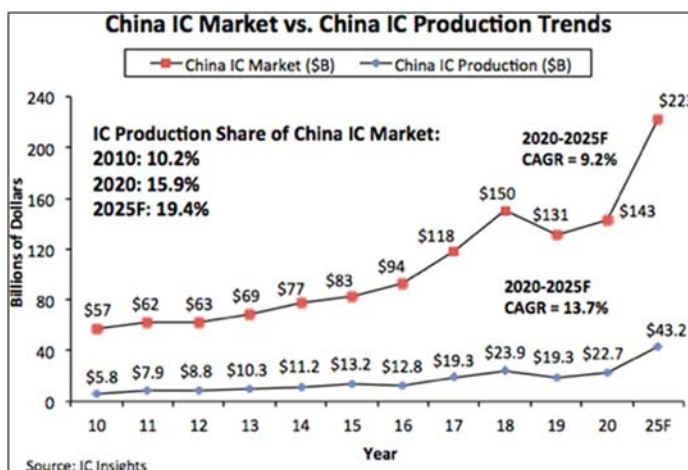
- **Intel** has announced that it has invested a further US\$475 million in Intel Products Vietnam (IPV). This new investment is in addition to Intel's US\$1 billion investment to build a state-of-the-art chip assembly and test manufacturing facility in Saigon Hi-Tech Park (SHTP), first announced in 2006. This takes Intel's total investment in its Vietnam facility to US\$1.5 billion. The additional investment was made between June 2019 and December 2020, and helped enhance manufacturing of Intel's 5G products, Intel Core processors with Intel Hybrid Technology and 10th Gen Intel Core processors.

- The Japanese company **Murata Manufacturing Co., Ltd.**'s subsidiary **Murata Electronics Trading (Shenzhen) Co., Ltd.** has installed a new anechoic chamber in Shenzhen, China and has begun providing EMC evaluation support. The Centre enables the evaluation of EMC, including radiated emissions, and represents Murata's second anechoic chamber in China, following Shanghai.

- **SK hynix Inc.** has signed a memorandum of understanding (MOU) with the Dalian Municipal People's Government of China and the Administrative Committee of Jinpu New District, Dalian, under which both parties will jointly collaborate on SK hynix's acquisition of **Intel's** Dalian semiconductor fabrication plant as well as SK hynix's future investments in Dalian. Last year, SK hynix announced that it had signed an agreement to acquire Intel's NAND memory and storage business for US\$9 billion, which includes Intel's NAND SSD business, NAND component and wafer business, and the Dalian Fab in the city's Jinpu New District. In accordance with the MOU, SK hynix will continue to invest in the Dalian Fab, while the Dalian government will provide support for SK hynix's acquisition of the Dalian Fab.

According to *IC Insights*, IC production in China represented 15.9% of its US\$143.4 billion IC market in 2020, up from 10.2% 10 years earlier in 2010. Moreover, IC Insights forecasts that this share will increase by 3.5 percentage points from 2020 to

19.4% in 2025 (a 0.7 percentage point per year gain on average). Of the US\$22.7 billion worth of ICs manufactured in China last year, China-headquartered companies produced only US\$8.3 billion (36.5%), accounting for only 5.9% of the country's IC market. TSMC, SK Hynix, Samsung, Intel, UMC, and other foreign companies that have IC wafer fabs located in China produced the rest. IC Insights estimated that of the US\$8.3 billion in ICs manufactured by China-based companies, about US\$2.3 billion was from IDMs and US\$6.0 billion was from pure-play foundries like SMIC. If China-based IC manufacturing rises to \$43.2 billion in 2025 as IC Insights forecasts, China-based IC production would still represent only 7.5% of the total forecasted 2025 worldwide IC market of US\$577.9 billion. Even after adding a significant mark-up to some of the Chinese producers' IC sales (many Chinese IC producers are foundries that sell their ICs to companies that re-sell these products to the electronic system producers), China-based IC production would still likely represent only about 10% of the global IC market in 2025.



## European Electronic Markets Forecast

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**Subscription Price for 1 year (12 e-mail issues) £450.00**  
 Prices valid to the end of 2021

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