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# cecimo

Where manufacturing begins

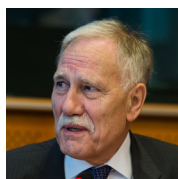
## magazine



## CECIMO SPECIAL MANUFACTURING IN TIMES OF COVID

### Competitiveness and resilience in Europe

Addressing challenges  
for long-term,  
sustainable investments  
in the European industry



Dominique Riquet  
Member of the European  
Parliament

### Digitisation in Europe's recovery

The strategic role of a  
digital layer in business  
and operational models



Eva Kaili  
Member of the European  
Parliament

### Skills for the Twin Transitions

Effects of the pandemic  
in accelerating digital  
transformation and  
accentuating skills gaps

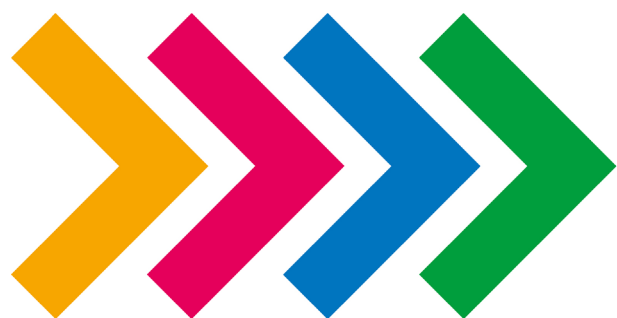


Nicolas Schmit  
European Commissioner for  
Jobs and Social Rights



SAVE THE DATES

**EMO**  
**ILANO**



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**fieramilano** 4-9 October



**FONDAZIONE  
UCIMU**



**RELOADED**  
**METAV/2020**  
DÜSSELDORF, 23 – 26 MARCH 2021 / POWER YOUR BUSINESS

## EDITORIAL

# The European industry – the cornerstone of sustainable economic growth in the post-COVID-19 economy



The COVID-19 pandemic has had a double effect on our society. First and foremost, it has been costly in terms of public health and human lives, as the pandemic has sadly led to many deaths around the world. It has also led to a considerable disruption of business activity and global trade. The coronavirus crisis has spread across the world, limiting investment and trade opportunities, and dampening production and demand for all sorts of goods. As borders close to contain the virus, globalisation rolls back and with it, business opportunities and prosperity.

At this critical time, the European manufacturing industry plays a vital role in the long-term global response to the pandemic. Manufacturing is key in promoting sustainable economic growth and development. Furthermore, digitisation is expected to play a major role in Europe's economic recovery, and, based on business reaction to the pandemic, we can certainly say that the outbreak of the health crisis has accelerated the implementation of digital solutions. Machine tool companies have always been driven by innovation and technological change and CECIMO has been supporting and advocating an inclusive digital transformation for many years.

This new edition of the CECIMO Magazine will focus on how digital solutions can help drive European manufacturing's recovery following the coronavirus-driven economic crisis. Moreover, in a conversation with the Member of the European Parliament, Ms Eva Kaili, we examine the challenges the industry faces as the European Union moves forward with its digital and innovation agenda. You can also read more about the latest news on the new EU industrial policy and the Union's resilience and recovery strategies, which all include a digital dimension.

The digital transition is also leading to significant changes in the labour market. Considering this issue's relevance at a political and economic levels, this magazine highlights the importance of future of work and skills required to stay competitive in today's work industries. The European Commissioner for Jobs and Social Rights, Mr Nicolas Schmit recognised CECIMO's work in the domain of skills. In this number you can find a short interview with the Commissioner, in which he addresses the issue of digital skills for the new European labour market.

This Magazine will also give you insights into the European automotive sector, one of the hardest hit industrial sectors during the pandemic.

Moreover, the Magazine provides an overview of the recent developments in other policy areas relevant to our sector, as well as updates on EU-funded projects CECIMO is currently involved in.

Lastly, I would like to thank you, the contributors and readers of the CECIMO Magazine, for your interest and for joining us each year. I encourage you to continue reading our Magazine, to keep up-to-date with the latest news and policy developments from the manufacturing sector.

I hope you will enjoy this new iteration of the CECIMO Magazine.

Filip Geerts  
Director General

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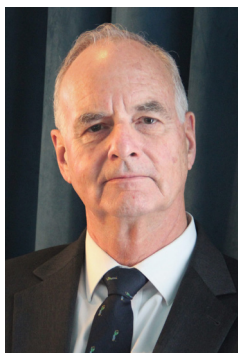
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***"Europe needs a clear and flexible business ecosystem as well as investment framework that fosters innovation and allows the development of new technologies and digital services. Establishing a common regulatory framework for new technologies would promote their proliferation and avoid the creation of market barriers and market fragmentation."***

Dr. Hans-Martin  
Schneeberger  
CECIMO President

## The President of CECIMO on the COVID crisis

by Caterina Nissim, CECIMO Communications Manager

Dr. Hans-Martin Schneeberger has been President of CECIMO since December 2019 during the 70th year of life of the association, arguably one of its most difficult years yet. CECIMO has taken many actions throughout the year to ensure that the voice of manufacturers is heard during the coronavirus pandemic and with the ultimate goal of supporting its members and their businesses in these trying times.

CECIMO is ensuring its contribution in the formulation of an appropriate recovery plan and is continuing its effort for the future development of the industry, both at national and international level. The recovery of the machine tool industry is key to improve the European economy's technological capabilities and support its growth. Our industries are of strategic importance for Europe, with a total turnover of around 27 billion euros only in 2019. The European machine tool sector is also one of the most inventive, contributing to research and innovation in fields such as additive manufacturing, robotics, and Artificial Intelligence (AI).

The president's term particularly focuses on the setting of global standards and the uptake of Artificial Intelligence and he believes that digital technologies will transform the current

economic structures and create new business opportunities, while playing a key role in driving the green transition. Especially during this time, the number of European citizens and industries that rely on digital solutions and innovation are constantly increasing. During this crisis, the world as we know it is changing at an incredible speed and it is time for AI standards and regulations to evolve at that pace, too. For this reason, CECIMO supports the initiatives of the European Commission towards climate neutrality and digital leadership.

Additive Manufacturing is also proving crucial during this difficult time. Earlier this year, CECIMO launched a call to action asking the sector to help in the printing of valves, masks and other items of primary importance that were lacking during the COVID emergency. The participation rate to the call was high, leaving CECIMO hopeful that the sector will keep contributing to the development of new solutions to support the healthcare sector as well as many others.

Now, more than ever, policy and industry representatives must go hand in hand. Only collective efforts could lead to successful recovery and create a base for long-term sustainable growth and prosperity of Europe. ■







***"Digitisation is expected to play a major role in the post-Covid 19 world. Fostering competitiveness through innovative digital solutions is critical for an effective, long-term global response to the pandemic and to promote sustainable economic growth and development."***

José Pérez Berdud  
CEO  
Fagor Automation S.COOP

# The role of digitisation in Europe's economic recovery

An interview with Eva Kaili, Member of the European Parliament



***Digitisation is expected to play a major role in a post-COVID world. How can digital solutions accelerate Europe's economic recovery?***

What we experienced during the COVID pandemic was the strategic importance of a digital layer in the business model (creating and capturing value) and the operational model (delivering value) of the firms. Of course, European enterprises, especially the SMEs and the very small enterprises, that form the backbone of the EU economy, were the most vulnerable both in the deterioration of the supply chains, and the collapse of the aggregate demand. In the long-run, innovative business models will determine the link between exponential technologies with growth. But in the short run, blockchain, data analytics and basic AI are important for reducing inefficiencies in the supply chains. They are also critical for the improvement of on-boarding and access to finance through fintech solutions. Improve marketing operations to sustain demand, and strengthen the monitoring of the market dynamics, which is critical both for the business people and the government for spotting risks, contagions and inefficiencies in the flows.

***The success of AI applications and machine learning depends on data access. Do you think Europe is running on a secure and trustworthy data infrastructure?***

Europe is known world widely for the quality of

its data. The stark difference between Europe and other AI "competitors" in the world is that in Europe we have set concrete and high standard rules for any use of personal data something that is not evident in China or the USA. Look at the GDPR which is recognised as the world's leading framework for protection of digital personal rights. This is what we are currently trying to create in Europe currently: A GDPR for AI, an ethical code for its use which will have to be respected by all companies wanting to operate and do business in the EU. Further to that, I think we need to build our strategic autonomy in the digital field. Big tech companies are collecting massive amounts of personal data which means that Europeans are losing control over their personal information and privacy. Gaia-X is our European project to create cloud infrastructure and get away from our dependence on US firms which dominate the field. It's a very good step in order to make sure that our data are stored under European values and protection standards. Moreover, we are also strengthening or consumer protection rules so as to allow authorities to "test and certify" data used by algorithms to develop cars or even toys. At the European Parliament we are also working hard to create incentives for data access and reuse between businesses, between businesses and government, and to make public sector data more widely available by building secure European data spaces that focus on specific areas and are governed by the same data governance and interoperability rules.



***What are the main obstacles to data-sharing across EU countries and how can we bridge them in order to improve interoperability, availability and data storage within the EU? How do you see Gaia-x?***

Data fragmentation is a very critical infrastructure impediment for the scalability of a European data space. On the other hand, we also need to consider the lack of a unified governance regime regarding the use, reuse and storage and valuation of data. The latter problem we expect to be addressed, from the regulatory point of view by two major legislative initiative of the EU, the Data Act and the Data Governance Regulation expected to come to the Parliament in the coming months. However, regulation by itself cannot solve infrastructure problems. Europe needs to build its own capacity in cloud services and mitigate its technological exposure to third countries. A European cloud, like Gaia-x if designed properly, could be a reasonable next step, although it could be ideal instead, to set strict rules and controls to EU companies to collaborate in this direction, as such could be a less costly and more secure option, challenging them to use blockchain and other technologies to secure sensitive data for example. But what is the most appropriate data storage architecture for the future? Only time will tell us, as augmented IoT. Machine to machine ecosystem will gradually become mainstream. Then an alternative model may prove itself as most appropriate, this is the reason why EU explores alternatives like edge/fog/mist computing.

***Digitisation will also pave the way to new business models and data-driven services. What could this mean for SMEs who have not yet implemented digital solutions?***

Rapid digital capacity and skills development became part of the definition of "economic resilience" of the EU, and significant amounts of capital we expect to be channelled to digital capacity for SMEs through the Just transition Mechanism and particularly the InvestEU, a file

that I am standing rapporteur in the Industry Committee. Most important though is to make sure that we will translate the notional demand for digital transformation in SMEs to effective demand. Effective demand is not very robust in EU so far, and this has critical effects on profitability and operational efficiency metrics. Most importantly, it affects the competitiveness and the viability of the European productivity model in the long-run. Digitalisation is not a remote plan. COVID proved that the long-run is now. SMEs need to show commitment, leadership and persistence in changing their business and operational models.

***The European Commission is taking bold and ambitious steps to improve the Union's AI regulation. Are these really enough to place Europe among key global markets? Furthermore, how can we speed up AI uptake in the industrial sector?***

Europe has done a lot and is a leader in the domain of trustworthy AI. Central to our efforts is the notion of AI made in Europe, that pays particular attention to socio-ethical considerations. Here at the European Parliament, we work on several aspects of AI governance with a special focus on its legal and ethical aspects and the control of algorithmic decision-making systems. What is needed is to achieve harmonization among member states and complete the digital single market. Also the industrial sector needs to increase its engagement of AI if we want to stay relevant in the world. The European Commission has been establishing Digital Innovation Hubs (DIHs) with focus on AI and this is an important initiative we called for since our last mandate, and which will ensure that EU companies and especially SMEs will get assistance in acquiring AI expertise. At the same time, we are moving towards the establishment of EU-wide testing facilities for certain AI applications and the creation of an EU research ecosystem that will pave the way for an AI-startup environment and facilitate their access to funding also in the scale up phase. ■







***"Car manufacturers have faced numerous difficulties this year, from supply chain shortages to low investment prospects. Additionally, the transition towards EV technologies is already having an impact on machinery demand. The automotive industry is indeed at a turning point, as well as other durable and capital goods sectors. Policymakers, especially in Europe, must therefore design a comprehensive, long term strategy to adapt manufacturing to the post-coronavirus economy."***

Dr. Heinz-Juergen Prokop  
Board and CEO  
Machine Tools  
TRUMPF Werkzeugmaschinen  
GmbH

# From crisis to opportunity: European MT Industry during the coronavirus pandemic

By José Díaz, CECIMO EU Public Affairs Economist

It would not be an understatement to claim that 2020 will be the year of the coronavirus pandemic. More than 130 countries have all registered a significant number of infections and governments from all levels have been forced to implement strict lockdown policies to contain and roll back the rate of infections. Europe has been one of the hardest hit regions. Besides the deep social scar left behind by the ongoing public health crisis, the pandemic has also caused considerable economic hardship on several business sectors.

European manufacturing has been one of them. Industrial companies, including machine tool companies, have gone through a very complicated juncture during the first half of 2020.

CECIMO8 machine tool order intake has had one of its weakest performances. In Q2 2020 foreign, domestic and total orders decreased dramatically on a yearly basis due mostly to the containment measures implemented amid the coronavirus pandemic. Compared to Q2 2019, CECIMO foreign orders dropped by -51%, while domestic orders fell by -45%. CECIMO8 total orders have dropped by -49% over the same period.

Considering EU27 Industrial Production Index data (Eurostat), industrial activity in the European Union decreased by -10% on a yearly basis in Q1 2020. For the first time since early 2015, the region's industrial production index fell below the 100-point threshold, standing then at a quarterly value of 96,5 points. Industrial performance would nevertheless worsen during the next quarter. EU27 industrial production decreased by -19,3% in Q2 2020 against Q2 2019, falling to 85,2 points, the lowest score recorded since Q2 2009, during the financial crisis.

In response to successive cutbacks in orders and industrial activity, companies in the investment goods sector, which comprise the machine tool industry, have greatly adjusted their levels of operation over the last six months. During the first quarter of 2020, capacity utilization among companies stood at 83%, signaling the continuation of a downward trend that began back in 2018. However, as lockdown measures came into full effect, companies would slash their levels of operation considerably in Q2 2020 down to 66%, the lowest rate recorded in almost 25 years, far worse than crisis-stricken Q3 2009's score of 70%.





***"The fact that our industry has been able to produce reliable and quality machines for other sectors and, at the same time, provide new technological solutions, such as new AM equipment, and enhanced productivity through digitalisation, shows the real potential of the industry. Innovation will help the machine tool sector fully bounce back from the pandemic and create new investment opportunities for our clients."***

Marcus Burton  
Non-executive director  
Yamazaki Mazak UK Ltd and  
Chairman of CECIMO  
Economic Committee

The dwindling usage of machinery has been but one of the many difficulties manufacturing companies have faced. The transportation of goods and the installation and servicing of machinery has been impaired due to the many, and often unclear, travel restrictions. In the meantime, labor productivity has also decreased since the new social distancing requirements have kept many workers away from their workplace.

In terms of apparent machine tool consumption, another key variable to understand our sector, the near-term and long-term outlook seems to vary significantly between different markets. According to Oxford Economics, European MT consumption is expected to decrease by more than -30% in 2020 down to 15 billion USD. The region would register a significant, albeit partial, rebound in 2021, with a yearly growth rate of 23,5%. MT consumption is forecast to grow between 2022 and 2024, yet the rate would slow down and progressively flatten. Even though the economic situation will potentially improve in the European market, consumption levels are not expected to return to pre-crisis levels by the end of the forecasted cycle (21,3 billion USD in 2024 against 22,2 billion euros in 2019).

The US should fare better than Europe. Following a deep drop in 2020 (-24,5%), MT consumption levels should rebound strongly, of 24,3%, in 2021. However, as in Europe, the growth rate should slow down as of 2022. MT consumption volumes would nevertheless near pre-coronavirus levels in 2022 (9,7 billion USD)

and continue to increase over the next two years, reaching a 10,2 billion USD reading.

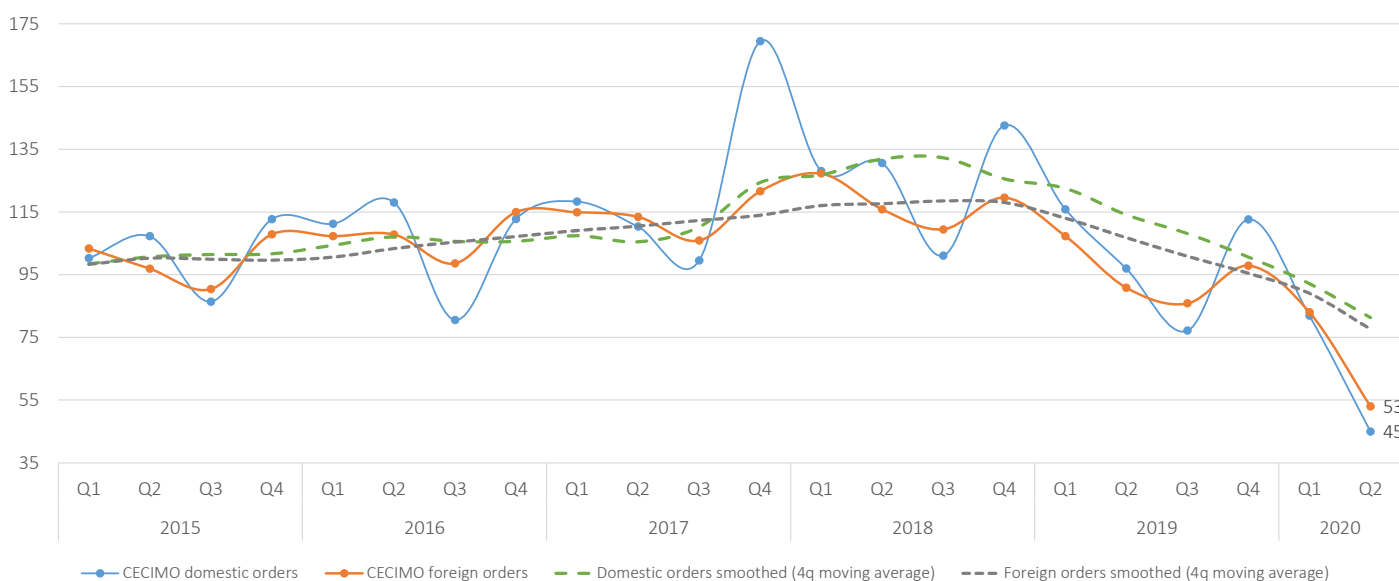
Lastly, China, the largest MT domestic market, consumption began its downturn in 2018, after peaking in 2017. The situation worsened significantly in 2019, especially by the end of the year, as the coronavirus quickly spread across the country and disrupted business activity. Consumption then fell by more than -23%. 2020 will also be a down year, but the decline would be more moderate (-6,9%). OE estimates indicate that Chinese MT consumption levels should return to 2019 levels in 2021 (around 22,6 billion USD) and continue to expand beyond 2022, although the rate of growth should be moderate year by year.

From a cross-sectoral standpoint, the machine tool-purchasing sectors have all endured significant cutbacks in output since the offset of the global pandemic, which reflects on the overall demand for machinery. The motor vehicle industry, has lost, globally, more than -35% of its production between Q4 2019 and Q2 2020, according to OE estimates. Further, the automotive recovery has so far proven to be uneven. China has managed to restart the domestic car industry and its retail activity, while Europe and the US, although registering a strong short-term rebound in production, investment and sales, are projected to remain on the downside, given a weak costumers' sentiment and the likelihood of protracted lockdowns. Motor vehicle output will possibly return to pre-crisis levels during the first quarter of 2022. ■

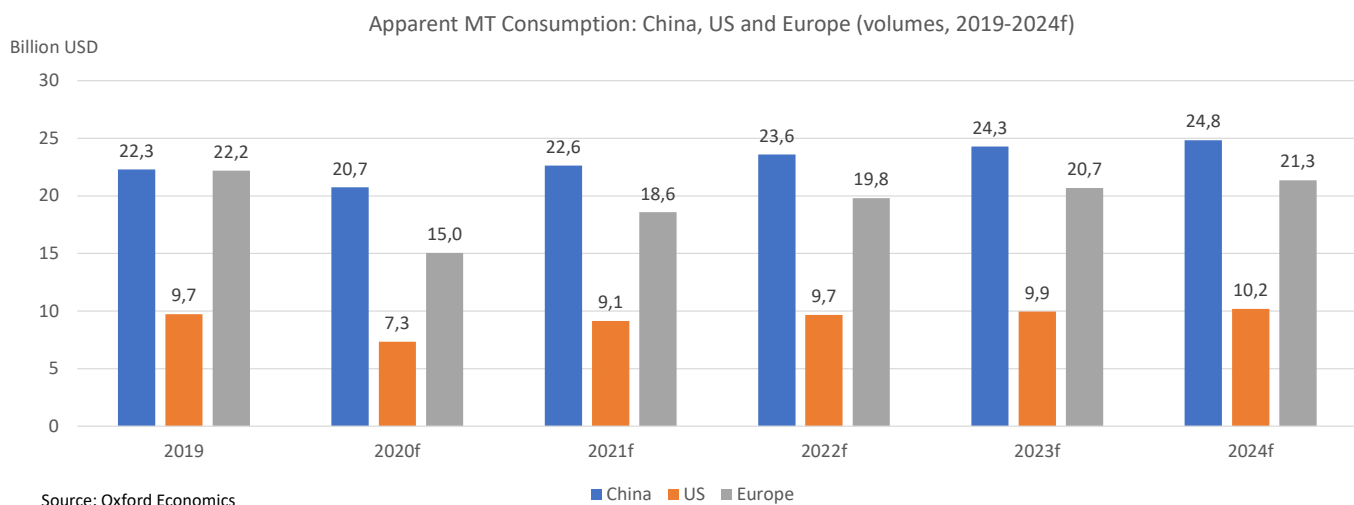
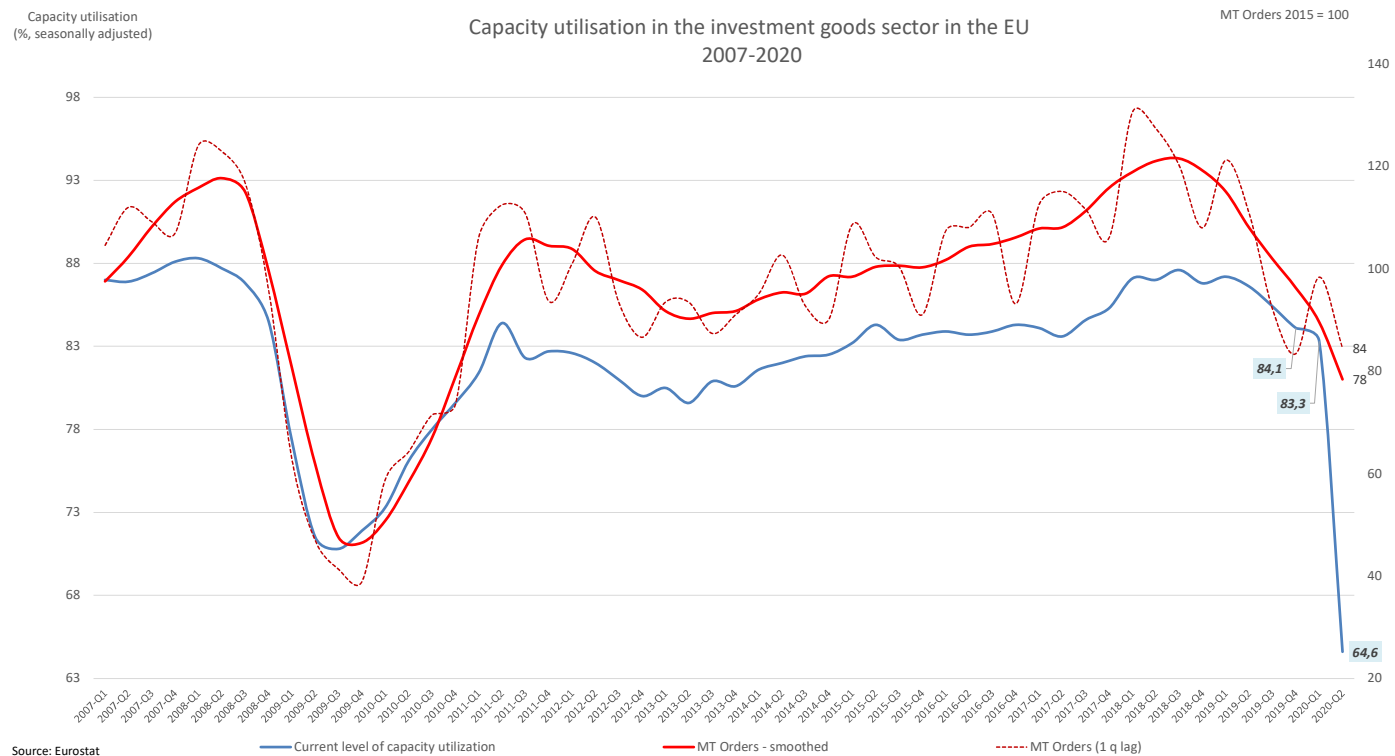
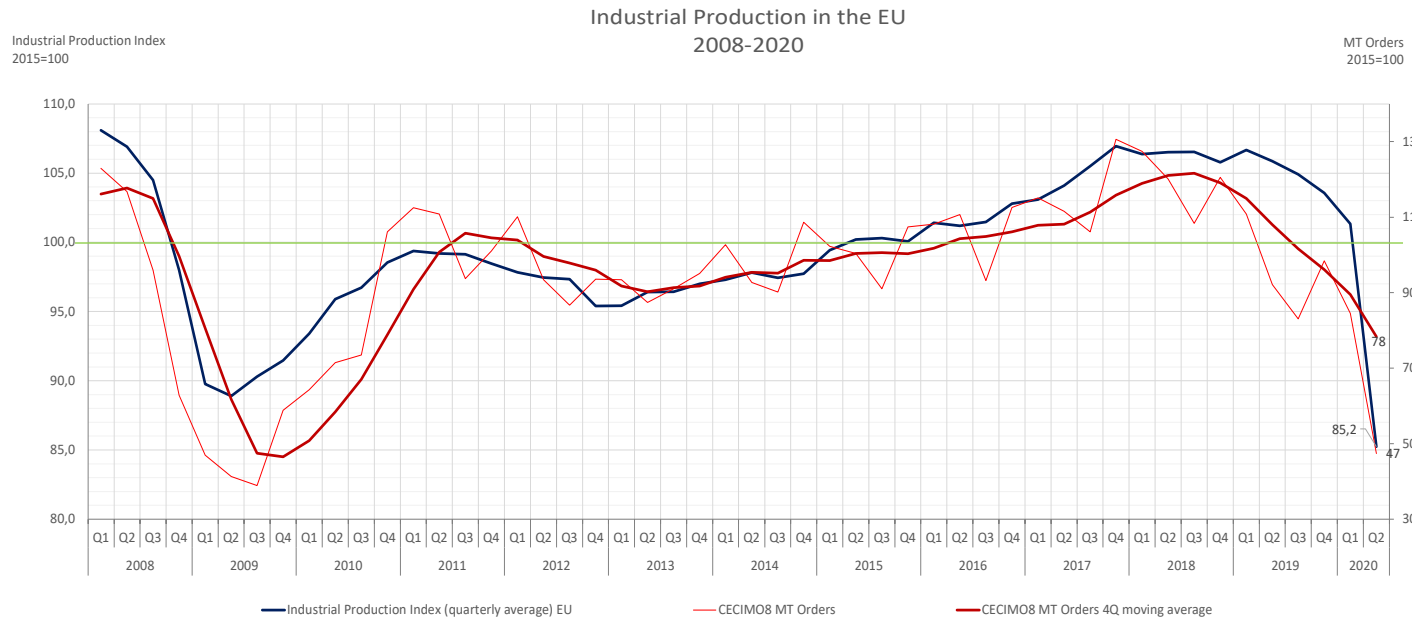
MT Orders (Index 100 = 2015)

CECIMO Domestic & Foreign Orders (2015-2020)

Source: CECIMO & National Associations









# In conversation with the European Automobile Manufacturers' Association

An interview with Eric-Mark Huitema, Director General, ACEA



Eric-Mark Huitema  
ACEA

## ***How has coronavirus impacted the auto sector?***

The effect of the coronavirus on society and the global economy is unprecedented. It is likely to be more impactful and last longer than the financial crisis of 2008-2009. Indeed, all EU markets are in recession this year and the EU GDP is set to contract by 8.1% in 2020. Unemployment in the EU is expected to increase to 9% this year. This has grave consequences for the automobile industry.

Most vehicle manufacturers had to shut down their development and production sites for several weeks or even months during the lock-down period, with an EU-wide average shutdown of 30 working days. The same is true for most suppliers, dealerships and repair shops. The jobs of more than 1.1 million Europeans working in automobile manufacturing were affected by such shutdowns at the peak of the crisis (this figure only refers to those people directly employed by car, truck, van and bus manufacturers – the impact on the wider automotive supply chain was even more critical).

On a more long-term level, major layoff across the industry are starting to be announced. EU-wide production losses due to COVID-19 amounted to 3.6 motor vehicles during the first half of this year, or some 20% of total production in 2019. These losses are the result of both factory shutdowns (especially during the 'lockdown' months of March, April and May) and the fact that production capacity has not yet returned to pre-crisis levels.

Over the first eight months of 2020, EU demand for passenger cars contracted by 32%. In total, 6.1 million new cars were registered across the European Union from January to August, almost 2.9 million less than during the same period last year. ACEA has also radically

revised its full-year 2020 forecast for passenger car registrations down to about -25%: the sharpest drop ever witnessed by our sector. The picture is similar on the global scale, with market demand expected to shrink by 21% this year.

## ***In addition to COVID-19, what are the challenges facing the sector right now?***

Unfortunately, on top of COVID, there is a risk of a second devastating economic hit just around the corner, in the shape of a 'no deal' Brexit. This scenario would result in EU-UK trade losses worth up to €110 billion to 2025, on top of around €100 billion in lost production value so far this year because of coronavirus.

What is more, the European Commission also recently unveiled its '2030 Climate Target Plan', raising the overall EU climate target for 2030 to a 55% CO<sub>2</sub> reduction compared to 1990 levels, up from the previous -40% target. The auto industry fully supports the European Union's long-term goal of climate neutrality by 2050, and wants to play its part in making Europe the first climate-neutral continent. However, the ambitious targets laid out in the Commission proposal will require massive additional investments from the auto industry, at the very time when it has been rocked by the coronavirus crisis. In short, COVID is adding a lot of extra pressure on the auto sector at a time when it is navigating fundamental technological shifts, as well as geo-political challenges.

## ***What is your opinion about the national recovery plans?***

ACEA believes that there should be a strong focus on increasing the uptake of the latest clean vehicle technologies under these plans.





These include zero- and low-emission vehicles and those meeting the latest Euro standards (Euro 6d Temp/Euro VI), with higher financial support being given to zero- and low-emission vehicles.

We are disappointed to note that several of the national fleet renewal schemes focus exclusively on electric vehicles, which represent a small albeit growing share of the total market. Given the dramatic collapse in sales over the last months, the market as a whole urgently needs a strong boost, in a way that will still reduce overall fleet air pollution and CO2 emissions on the long term. In addition, the schemes announced so far fail to provide much-needed measures for the heavy-duty vehicle market, which has also plummeted.

We urge governments and the EU to include dedicated heavy-duty vehicle fleet renewal schemes in their recovery plans as soon as possible.

If we want the 'definitive leap' in zero and low emission transport to take place, policy makers must first ensure that the necessary enabling factors are delivered and strengthened. These include a dense EU-wide network of charging points and re-fuelling stations (with binding targets for member states), coupled with economically sustainable incentive schemes, so that zero-emission mobility can become an accessible and affordable option for all Europeans. The COVID recovery plans should be used to this effect to ensure a strong and green rebound of our industry. ■





# An Industrial Strategy for a green, digital and resilient EU industry



Lorena Ionita  
European Commission

By Lorena Ionita, Deputy Head of Unit, DG Internal Market, Industry, Entrepreneurship and SMEs (DG GROW), European Commission

**On 10 March 2020, the Commission adopted an Industrial Strategy for Europe to enable European industry to lead the green and digital transformation, drive Europe's global competitiveness and reinforce its open strategic autonomy. The Recovery Plan with the firepower of the new recovery instrument Next Generation EU and a revamped long-term budget present an opportunity to invest in Europe's future and develop a more resilient European industry. Making this happen will require a collective effort by public authorities, industry and all relevant stakeholders.**

In the March Industrial Strategy, the Commission proposes a new and innovative industrial ecosystems approach. The notion of ecosystems captures the complex set of interlinkages among sectors and firms spreading across countries in the Single Market. The industrial ecosystems encompass all players operating along a value chain: the smallest start-ups and the largest companies, from research activities to services providers and suppliers. The ecosystems approach will be a useful way of analysing the impact of the pandemic on each ecosystem. A complete mapping of the needs and the tools that can be deployed (e.g. at financial and regulatory level) will enable the Commission to identify the priority needs of each industrial ecosystem. On the basis of this mapping, we will target our collective efforts where they are needed most, without silos.

Industrial alliances are one of the tools to achieve scale and impact through collective action involving all willing partners. These alliances can be an important tool to identify technology needs, investment opportunities

and regulatory barriers and enablers at all stages of the value chain. Building on the success of the European Battery Alliance, the Commission launched in July 2020 the European Clean Hydrogen Alliance and in September 2020 the European Raw Materials Alliance.

Skills are central to recovery and for mastering the digital and green transitions. To this end, the Commission launched the European skills agenda. In particular, the Pact for Skills enables all relevant partners to join forces and make substantial progress in meeting Europe's skills needs.

Dialogue and co-creation with stakeholders is essential for the successful implementation of the Industrial Strategy. A new Industrial Forum, expected to be established by end 2020, will be an open and inclusive mechanism for joint design of solutions with stakeholders.

Working together in solidarity is also a key lesson from the coronavirus crisis. The response of additive manufacturing at the beginning of the pandemic as an alternative production possibility for certain medical supplies is an example of such solidarity. The Commission mobilised cluster organisations to identify and create a network of companies with available additive manufacturing capacities. More than 1000 offers came from many different industries to produce personal protective equipment for health professionals or print specific missing spare parts for ventilators.

To help repair the economic and social damage brought by the coronavirus pandemic, the Commission proposed in May 2020 a major Recovery Plan for Europe. The new EUR 750 billion recovery instrument Next Generation EU will support the recovery across three pillars.





***"Businessmen and women around the world acknowledge the importance of both industry and industrial policy as drivers of sustainable growth. We therefore believe the EU should design and implement a comprehensive industrial policy, one that launches the economic recovery of the region. Only a strong future oriented industrial policy at EU level can prevent permanent economic damage following the pandemic and successive lockdowns."***

Bruno Cathomen  
CEO  
Mikron Group

The first pillar is support to Member States to recover, repair and emerge stronger from the crisis – by promoting public investment and key structural reforms in the Member States, notably via the key instrument Recovery and Resilience Facility. The second pillar is about kick-starting the economy and mobilising private investment – creating the conditions for a recovery by investing in key sectors and technologies, crucial to the success of Europe's green and digital transitions. The third pillar is about learning the lessons of the crisis and addressing Europe's strategic challenges – building up the EU's capacity to respond to crises, and strengthening resilience to future shocks.

From this health crisis we learned that it is particularly important to ensure the proper functioning of the Single Market. We aim at creating a robust EU value chains across our industrial ecosystems. The Single Market is the ultimate engine for economic recovery.

The pandemic crisis has further accelerated the trends in the green and digital transformation of our industry. It has highlighted how the EU's global dependencies can affect our ability to react in a crisis. In this regard, the Commission will update the Industrial Strategy in the first half of 2021, taking into account the needs that have emerged from the crisis and make sure the European industry remains competitive and thrives at a global level. ■





# The jobs of tomorrow require skills for the twin transitions

An interview with Nicolas Schmit, European Commissioner for Jobs and Social Rights



***"In order to tackle the skills challenges successfully, all industrial sectors must be ready to implement new technologies and ensure to their employers the skill set required to operate higher-value digitized machinery and process."***

Dipl. Ing. Dr. Stefan Hansch  
CEO  
EMCO GmbH

## ***What are the implications of twin transitions on the skills gap?***

Skills are central to our recovery from the coronavirus pandemic and for mastering the digital and green transitions. Businesses, large and small, need skilled people to innovate and grow. Yet, mismatches and shortages in skills are increasing, while a large number of people are at risk of unemployment.

The twin green and digital transitions are reshaping the way we live, work and interact. The EU's move to a resource-efficient, circular, digitised and climate neutral economy and the wide deployment of artificial intelligence and robotics are expected to transform the labour market.

The pandemic has accelerated digital transformation and at the same time brought a sudden change in work organisation. While telework and distance learning have become a reality for millions of people in the EU, the pandemic has accentuated the digital skills gap. Many people do not have the required level of digital skills or are in workplaces or schools lagging behind in digitalisation.

## ***What skill set will be required to adapt the workforce to the industrial transformation currently taking place in Europe?***

The jobs of tomorrow require skills for the twin transitions. The green transition calls for professionals with the skills to build and master green technologies, develop green products, services and business models, create innovative nature-based solutions and help minimise the environmental footprint of activities. Europe will only become a climate neutral continent, a resource efficient society and a circular economy with an informed population and workforce that understands how to think and act green. Take the renovation wave as an example: We need the workers with the right skills to insulate houses and install heat pumps!

In addition, people increasingly need the so-called transversal skills to be able to adapt to change and increasingly work with artificial intelligence and robots. We also need to promote the human skills that give people the edge over robots in a world of increasing automation, such as communication, judgment, creativity, empathy, leadership and social skills.

To this end, the Commission launched an updated European Skills Agenda in July 2020. This initiative focuses on skills for jobs; closing the skills gaps in key economic sectors and making sure people have opportunities to build the skills they need to master the green and digital transitions.





***"In our experience, the MacDigital transformation, driven by technologies such as Artificial Intelligence, Internet of Things, robotics and additive manufacturing, is bringing numerous challenges for the manufacturing industry. The new emerging technologies have an impact on the entire value chain and are modifying the requirements on the labour market."***

Kåre Sørensen  
Senior Advisor  
Danish Manufacturing  
Industries Cooperation

***What can the European Commission do to support Member States and Regional Authorities in their efforts to support the workforce during the twin transition?***

With Next Generation EU, the Commission has proposed to focus on sustainable investment and reforms. With 37% of expenditure of the new Recovery and Resilience Facility earmarked for green transition spending and a minimum 20% to be invested in digital and skills proposed as a priority investment, Member States have an unprecedented opportunity to focus investment on up- and reskilling and put forward bold reforms of skills systems. Only by joining the forces of all relevant partners can we make substantial progress in meeting Europe's skills needs.

On 10 November, we launched the Pact for Skills which promotes joint action to maximise the impact of investing in improving existing skills (upskilling) and training in new skills (reskilling). It calls on industry, employers, social partners, chambers of commerce, public authorities, education and training providers and employment agencies to work together and make a clear commitment to invest in training for all working age people across the Union.

Today, most employers know that investing in skills needs to be a key issue in their strategy. They realise that they cannot rely on governments alone to take the responsibility for education and training. The Pact for Skills will gather and inspire different commitments from many different partners to create large-scale industrial partnerships. By joining the Pact, stakeholders will get access to networking, knowledge, guidance and resource hubs. We do not have time for half measures. We need to act now.

***Could you give us an example of successful EU-promoted initiatives, at national or regional level, that helped tackle the lack of skills in manufacturing?***

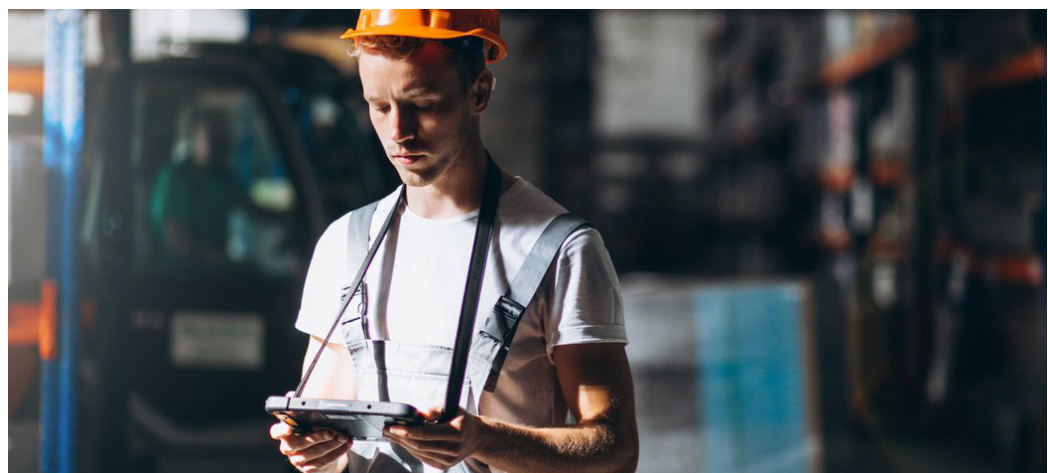
Many European projects in manufacturing supported under the Erasmus+ programme have tackled skills gaps. These projects generally identify the skills needs in a given sector in order to then develop, test and roll out training material for workers.

The Blueprint for sectoral cooperation on skills, one of the initiatives of the Skills Agenda for Europe 2016, went one step further. Under the Blueprint, stakeholders work together to develop and implement sector-wide strategies which support growth by addressing skills gaps. Blueprints gather intelligence on skill needs and design a long-term action plan to be rolled out nationally and regionally.

I am pleased that CECIMO has been actively involved in many European-funded projects, most recently in a Sector Skills Strategy in Additive Manufacturing. By joining forces on skills development, stakeholders can make sure that workers have the skills they need for labour market success and employers have access to the talent pool they need to stay competitive.

***How is the new European Skills Strategy supporting upskilling and reskilling of the workforce?***

The European Skills Agenda puts the focus firmly on skills for jobs and includes a strong element on skills intelligence, knowing which skills are and will be needed. The Pact for Skills, launched during the November 2020 Vocational Skills Week, aims to mobilise employers, social partners and industrial sectors to commit to upskilling and reskilling. In the Recommendation on vocational education and training, Member States commit to reforming VET systems in Europe, incorporating continuing training and upskilling throughout working life. Under the Digital Education Action Plan, we will develop a European Digital Skills Certificate to will allow workers and job seekers to indicate their levels of digital skills in a standard way, easily understood by employers and shareable across borders. ■





# The parliamentary Intergroup on Long-term, Sustainable Investments and Competitive European Industry

By Dominique Riquet, Member of the European Parliament



Dominique Riquet  
Member of the European Parliament

The parliamentary Intergroup on Long-term, Sustainable Investments and Competitive European Industry was officially launched on 26 October 2020 with an inaugural event with Commission Executive Vice-President Frans Timmermans in charge of the Green Deal delivering a keynote speech. The event featured discussions on the steps the EU needs to prioritise to recover stronger from this unprecedented crisis and to facilitate the green and digital transitions. It was attended by more than 400 participants, highlighting the strong interest for a newly created forum aimed at offering a platform enabling an open dialogue between decision-makers and stakeholders on critical issues affecting long-term investors and the industry.

With my colleagues MEPs, Simona Bonafè and Maria da Graça Carvalho, who are co-chairing this Intergroup with me, we believe that the real benefit of this Intergroup is to gather at the same table financial and industrial stakeholders. This duality is reflected in the Intergroup's organisation. The secretariat is run by Orgalim, representing Europe's Technology Industries, the Committee for European Construction Equipment (CECE), the European Long-Term Investors Association (ELTI) and the Brussels liaison offices of the National Promotional Banks and Institutions (NPBIs). The partners of the Intergroup, who can submit proposals for debates as well as technical contributions, also represent either the industry or the investors communities. Hence, during this legislative mandate, stakeholders will be offered the opportunity to provide MEPs with useful information from the ground and feedbacks that will in the end enrich MEPs' legislative activities in the relevant parliamentary committees. To that purpose, we aim to convene regular and targeted gatherings on specific issues to support this open dialogue.

The pandemic has exposed major European vulnerabilities and there is the need to reconsider the way key value chains are structured as well as how

to increase the level of investments, especially in automation and digitalisation. Failing to address these key aspects risks threatening European competitiveness, resilience and autonomy. The implementation of the green and digital transitions is very high on the European agenda. Addressing all these issues will require financial and industrial actors to work hand in hand based on massive and targeted public and private investments and a revised, well-designed and strengthened European industrial strategy. Only addressing these challenges together, we can maintain global competitiveness, reach climate neutrality by 2050 and make Europe fit for the digital age.

In a context of economic distress, companies will need to thrive while also accelerating the twin transitions and remaining competitive. We can already see that companies are postponing investment decisions due to the pandemic and to banks' reluctance to lend but also to uncertainties on the fiscal and regulatory front, with new disclosure and reporting requirements on their environmental, social and governance performance to be expected in the coming months. Besides the stimulus provided by the recovery plans, companies will need to rely on diversified financial sources, and here long-term investors will play an essential role to crowd in additional investments.

Moreover, in times of deep crisis within the multilateral trading system and with competing powerhouses such as USA and China, strengthening the European strategic autonomy will be essential for the EU to remain a shaping power at global level and reinforce its leadership on environmental and social standards, data protection, etc. Therefore, long-term investors and industrial companies should put emphasis on projects aimed at increasing European resilience and having clear European added value. Our Intergroup will be a useful forum to welcome these discussions between the industry, long-term investors and European policy-makers. ■



***"Common actions are essential for creating the favourable conditions for recovery, by investing in key sectors and technologies leading towards Europe's green and digital transitions. We very much welcome this momentum and are eager to continue the dialogue with policymakers."***

Filip Geerts  
Director General  
CECIMO



# The recovery package, an opportunity for the European MT industry

By Alessandra Zini, CECIMO EU Policy Officer and Projects Coordinator

We have been hearing about the recovery fund since July, but there is still a lot of uncertainty about 'how' and 'when' this money flow meant to re-boost the European economy in the aftermath of the first wave of the COVID-19 pandemic will be actually available. The recovery and resilient facility – the correct name to refer to the 'recovery fund' – has not found its final and definite shape yet. In fact, the European Institutions involved in its negotiation (European Parliament, the German presidency on behalf of the European Council, and the European Commission) are currently struggling to reach an agreement about the total amount of the Next Generation EU, which includes the recovery and resilience facility, and the next multiannual budget, mainly for political reasons.

What has been already decided is that the Member States that wish to benefit from the recovery fund must present a coherent national plan of reforms, clearly indicating how they intend to invest the money. It is, in fact, the governments that will have the final say on where to direct the available funds, but if on the one hand we cannot talk about definite numbers yet, on the other hand we can predict which are the sectors that will probably receive a big slice of the funding. In fact, the plans that governments must present to the European Commission to start the procedure of releasing the money have to be aligned with the European policies priorities and the specific country-based recommendations.

The resources available in the recovery should represent a once-in-a-lifetime opportunity for the machine tools industries to embrace the European twin challenges of the digital and green transition to enhance their productivity capability. The national plans should, in fact, contain tailored supportive measures for machine tools industries, as well

as for the manufacturing sector as a whole, as a key enabler of the European long-term goals.

Firstly, national governments should invest the resources of the recovery to reach two goals: one is to provide right and secure infrastructures to successfully deploy the internet services for Industry 4.0, such as 5G, IoT, cloud data, and cybersecurity related support services; the other one is to create a level playing field among European SMEs. These are the key actors of the transition, but their digital development is increasingly unevenly between the North and the South of Europe. SMEs need to be supported by the national governments to uptake new technologies in their supply chain, e.g. via a facilitated access to credit. At the same time, the national governments should focus on the workforce that will have to work in the Industry 4.0 industrial ecosystem. Tailored trainings, as well as reskilling and upskilling programmes for the current workforce, should accompany and support this technology implementation. National digital innovation hubs (DIH), a space of joint collaboration between Research centers, universities and industries, would play an important role, and measures should be taken accordingly to promote their visibility and support their services. Support to research and innovation should also enable the circularity of the economy, by studying and designing sustainable products and increase the recycled components in the machineries.

The sectors of intervention are several and the targets are ambitious. Hopefully, the agreement on the recovery fund will accelerate during the second wave of COVID-19 restrictions in Europe and Member States will start benefitting from it already in the first half of next year. ■







# Machine tools and the European Green Deal, a love story?

By Frédéric Melchior, CECIMO Director Technical Regulation



***"Machine tools are at the starting point of almost every manufacturing activity and therefore they have an essential role to play in the context of sustainable manufacturing, which will be key to turn the European Green Deal into a success story."***

Ramon Dooijewaard  
Director  
Federatie productie  
Technologie Sectie VIMAG

In December 2019, the European Commission presented one of its flagship initiatives, namely the European Green Deal. It is an integral part of the European Commission's strategy to implement the United Nation's 2030 Agenda and the sustainable development goals. The European Green Deal provides a roadmap with actions to boost the efficient use of resources by moving to a clean, circular economy and stop climate change, revert biodiversity loss and cut pollution. It outlines investments needed and financing tools available and explains how to ensure a just and inclusive transition. The European Green Deal covers all sectors of the economy, notably transport, energy, agriculture, buildings, and industries such as steel, cement, ICT, textiles, and chemicals.

As part of the European Green Deal, the European Commission published in March 2020 the second Circular Economy Action Plan. It aims to make the European economy fit for a green future, strengthen its competitiveness while protecting the environment and give new rights to consumers. Building on the work done since 2015, the second Circular Economy Action Plan focuses on the design and production for a circular economy, with the aim to ensure that the resources used are kept in the European economy for as long as possible.

However, our sector has not been waiting patiently for the European Commission to bring out the European Green Deal and the second Circular Economy Action Plan from its drawer. Machine tools are durable and last over 20 years. Also, machine tools are composed for 83% of metallic

materials which is easily recycle.

In other words, our sector's contribution to the circular economy began long before their respective existence, through different measures aiming at improving the performance of our products and developing as well as implementing new technologies. Additionally, repair, refurbishing and recycling of products are already a reality in our sector, but as important as these aspects is the role of machine tools and related manufacturing technologies as key enablers of the circular economy. By providing our clients with the latest manufacturing technologies we assist them to move towards a circular economy by increasing their productivity and giving them the means to optimise resources and processes

In Mid-2019, CECIMO published a report explaining how our sector is contributing to the circular economy. To implement its principles, our sector invests in new technologies, share best practices and works towards global standards. As Henry Ford said, "If everyone is moving forward together, then success takes care of itself". Therefore, policy makers can help by setting the appropriate framework for our sector to undertake this challenge, for example by supporting digitisation as well as Research and Development.

As there is always room for improvement, CECIMO is currently developing a strategy and an action plan to ensure that the European Green Deal and the second Circular Economy Action Plan are not hampering our sector but do also create opportunities for it. ■





# The revision of the Machinery Directive, what does the European Commission have in store?



*"The Machinery Directive has now been in place for more than 11 years and consequently what it entails is by now rather well known by most stakeholders. Drastic changes might not be necessary, but it is however our task to ensure that it provides legal clarity and is able to cope with any future technical developments."*

Marta Cebollero  
European Commission

In September 2020, CECIMO organised a webinar concerning the long-awaited impact assessment study on the revision of the Machinery Directive (Directive 2006/42/EC). Its publication was initially foreseen in February 2020, but also a cause of the COVID-19 pandemic, it was finally released in September 2020.

On that occasion, Marta Cebollero Arguis (DG GROW), kindly provided some insights about the main outcomes.

The impact assessment study is the result of desk research and literature review (for example market analysis), different kinds of stakeholder consultations (semi-structured interviews, an open consultation and an online survey) as well as case studies focusing on new technologies and the digitalisation of the machinery sector.

Overall, it was identified that the current Machinery Directive is mostly fit for purpose for ensuring the health and safety of machinery users, and overall fit for purpose for ensuring the well-functioning of the internal market.

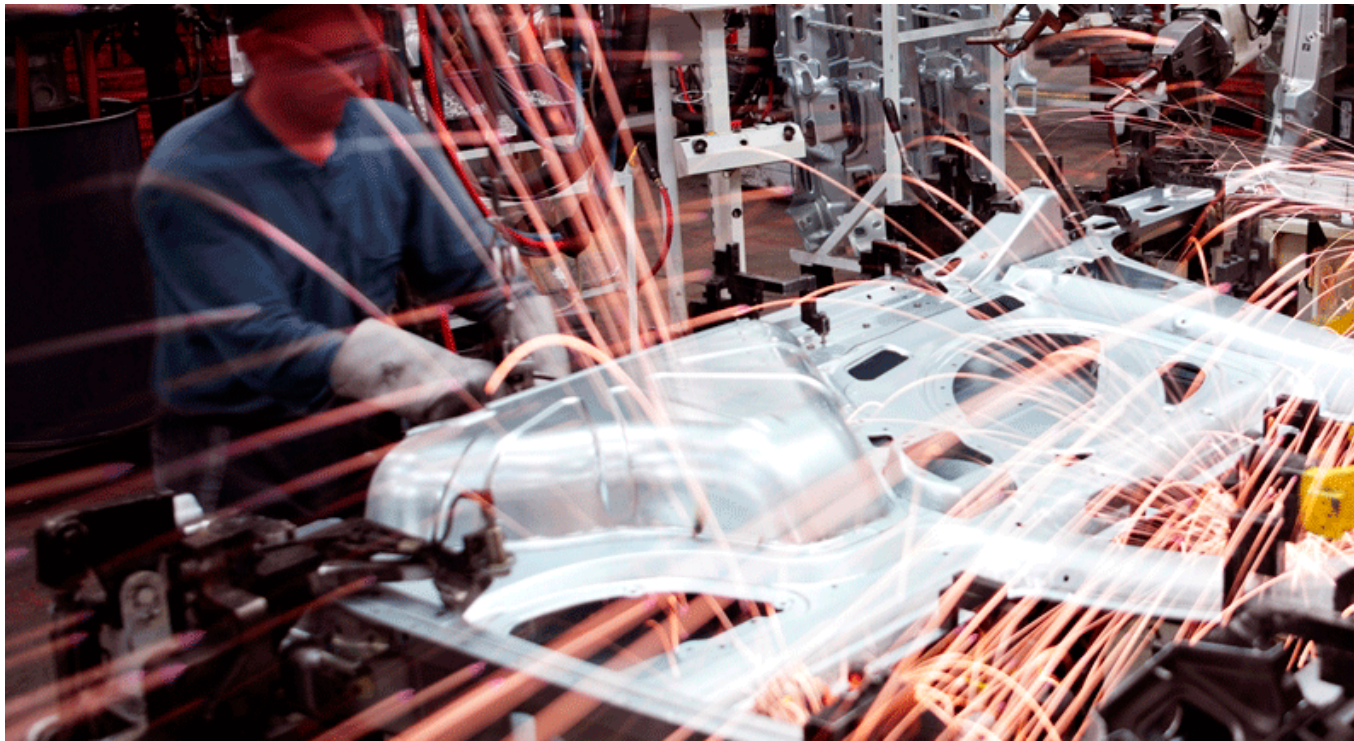
Nevertheless, suggested revisions would further improve the Machinery Directive's effectiveness and efficiency. Several policy options are analysed and compared at the moment, including an analysis of the specific aspects that could benefit from an adaptation in the form, to make an example, of more legal certainty and improvement of safety for users.

We would now like to shed some light on some additional findings of the impact assessment study.

To address new challenges posed by new technological developments, several Member States prefer to adapt some of the Essential Health and Safety Requirements (EHSRs) of the Machinery Directive rather than opting for a self-regulation of the market.

It was agreed on the lack of clarity concerning the scope, that overlapped between Machinery Directive and the Low Voltage Directive (Directive 2014/35/EU), and in some of the definitions. Additional clarifications may be introduced on some of the definitions given.





Another finding concerns the Annex IV "Categories of machinery to which one of the procedures referred to in Article 12(3) and (4) must be applied". Some Member States are recommending an amendment that would include the removal of the option for internal checks, that is allowed today. During the CECIMO webinar, participants raised concerns about this possibility. Such an approach would be possible for new products but not for old products, already placed on the market.

Some participants argued that many machine tool manufacturers have been dedicating a certain time and money to the elaboration of harmonised standards, and that such potential amendment would considerably reduce the value of all these efforts. The European Commission expressed that the potential impact is seriously taken into account while elaborating the new legislation.

Concerning the digital formats for the documentation, it seems that allowing a combination of digital and paper documentation might overall provide higher benefits than the costs related to the change.

A full alignment of the Machinery Directive to the New Legislative Framework (NLF) would be beneficial as it would, for example, translate into an increased harmonisation of market surveillance rules across the Member States.

Finally, converting the Directive to a Regulation is considered useful also considering that it might decrease costs and remove some unclarities stemming from different interpretations by the Member States.

A new legislation is expected to be adopted during Q1 2021, tentatively in March 2021. ■







# Is the Machinery Directive fit for purpose?

By Frédéric Melchior, CECIMO Director Technical Regulation



***"The Machinery Directive is our most important piece of legislation. Considering that it has been with us since the end of 2009 and that is a sound piece of legislation, we at CECIMO believe that no drastic changes should be introduced. The future should be characterised by continuity rather than by discontinuity. Let's hope that what the European Commission has in store corresponds to our needs."***

Massimo Carboniero  
Managing Director and  
Partner  
OMERA SRL and  
Chairman of the CECIMO  
Technical Committee

In the context of the ongoing revision of the Machinery Directive and when considering the upcoming adoption of a new legislative proposal in the beginning of 2021 (expected for March 2021), CECIMO, as the representative of the machine tool industry and related Manufacturing Technologies, would like to share its point of view.

From a general point of view, we believe that the Machinery Directive (Directive 2006/42/EC), taking everything into consideration, is a sound piece of legislation and that, consequently, any future revision should be characterised by continuity rather than by revolutionary changes.

Nevertheless, on this journey towards a new legislative proposal, three topics have gained in importance, namely, artificial intelligence, cybersecurity, and digital documentation.

Artificial intelligence (AI) is not something new but there has been a significant acceleration in the last years. However, in our sector, the acceleration has been lesser, and the AI is still at an early development stage. Moreover, there is a limited scope for AI applications in our sector. Examples of such applications are process optimisation, predictive maintenance, and condition monitoring.

As our sector is becoming more and more digitised, cybersecurity has the potential of becoming a major issue. However, our sector has not been waiting patiently and remained passive. Different solutions have during the years been implemented, for example by deploying different kinds of countermeasures such as advanced firewalls and virus scanners as well as providing safe and secure access to critical

data and parameters.

To address both AI and cybersecurity as well as other technological developments, we believe that the Machinery Directive's current essential health and safety requirements are today satisfactory. Moreover, AI and cybersecurity are both horizontal subjects, which are not limited to our sector and they should therefore be tackled in a horizontal manner. Likewise, "one size fits all" approaches should be avoided for both as AI's and cybersecurity's respective scope of application vary widely in the different sectors. Finally, we consider that both harmonised standards and the "Guide to application of the Machinery Directive 2006/42/EC", are better suited instruments to manage technological developments.

The possibility to allow digital documentation is welcomed by our sector. There are many advantages with its use, both for manufacturers and customers. One of these is to provide customers with an increased searchability, which is vital in the case of an incident. It is however important that manufacturers remain free to select which documentation should be offered in a digital format and how it should be offered. This should of course be done in accordance with all the relevant requirements of the Machinery Directive. According to us, the best way forward to enable digital documentation is the introduction of some additional explanations and clarifications in the Guide to application of the Machinery Directive 2006/42/EC".

Therefore, we believe that there is no need to revise the Machinery Directive as it is already today able to adequately address AI, cybersecurity, and digital documentation. ■





***"Machinery builders in Britain and continental Europe need clear and concise trade rules. Without these, exports and imports would be more costly and less accessible, an unnecessary burden for companies in these trying times. Trade can help kickstart Britain's economy and the European Single Market once the pandemic has been controlled. Policymakers in London and Brussels should bear this in mind."***

James Selka  
CEO  
MTA

# An Urgent Trade Deal for Trying Times: Why the EU-UK Free Trade Agreement Matters

By José Díaz, CECIMO EU Public Affairs Economist

Since March 2020, following the United Kingdom's formal withdrawal from the European Union on 31 January, the European Commission and the British Government have been negotiating a new Free Trade Agreement which would lay the groundwork of the new UK-EU economic relationship.

In the pursue of a comprehensive deal, both negotiating parties have sought the advice from European trade associations -among them CECIMO-, which have supplied their organizational expertise, market insights and technological know-how.

Even though associations like CECIMO have made great efforts to ensure this relationship remains strong and advantageous for all parties, the outcome of the negotiations is, to this date, uncertain. After nine rounds of negotiations, little progress has been made, as both the European Commission and the British Government have been unable to settle on issues such as mutual recognition of standards, conformity assessment procedures or tariff, to name a few.

In the meantime, the coronavirus health crisis has only made an already uncertain situation even more challenging. European and British manufacturing companies have endured a short, albeit intense period of economic duress. As demand for machinery decreases and cross-European supply chains bear the burden of lockdown policies, companies have been forced to decrease their operating rate, cut jobs and delay if not cancel new investments. The current health crisis is far from over and a potential second wave of lockdown policies could cause further losses, both economic and social. In this juncture, political outcomes such

as a no-deal "exit" of the United Kingdom from the European Single Market would not only worsen the economic scenario, but also delay the future recovery of the manufacturing sector.

The current health crisis has certainly made this Free Trade Agreement (FTA) an immediate need for manufacturers. However, there are more substantial reasons for an FTA, which go well beyond the current crisis.

The EU and the UK have a long-lasting relationship that goes back to the early 1970s. Ever since the UK's accession to the European Union, trade between European and British markets has been essentially frictionless and has given way to a dynamic clustering exports and import flows. As per the latest yearly figures, in 2019, 14,5% of extra-EU27 exports flowed towards the British market, making the UK the EU's second largest foreign market (after the United States). Britain is also the European Single Market's third largest supplier (8,5% share over non-EU imports), behind China (20%) and the US (12%).

Conversely, 45,9% of UK total world exports go to the European Single Market, while 49,4% the European Single Market supplied 49,4% of British total world imports.

Concerning the European machine tool industry, British companies are deeply rooted in the broader European value chain. In 2019, the British machine tool industry represented 2,4% of CECIMO's total output and 4,1% of total CECIMO machine tool consumption. British companies also contributed notably to European machine tool trade in 2019, with a 2,9% share over total CECIMO exports and a 6% share over CECIMO total imports.





Furthermore, British machine tool trade flows are clearly linked to the European Single Market, as 53,1% of British world machine tool exports are purchased by Europe-based companies and almost 60% of British world machine tool imports flow into the British national market from continental Europe. The United Kingdom is thus not only a long-time trade partner of European Member States, but also a cornerstone of modern European manufacturing.

CECIMO believes European companies should work closely with their British counterparts to push for an FTA that provides long-term stability and creates new business and innovation opportunities, which could prove critical for the economic recovery of the EU and the UK. James Selka, Chief Executive Officer of the Manufacturing Technologies

Association, states: "Machinery builders in Britain and continental Europe need clear and concise trade rules. Without these, exports and imports would be more costly and less accessible, an unnecessary burden for companies in these trying times. Trade can help kickstart Britain's economy and the European Single Market once the pandemic has been controlled. Policymakers in London and Brussels should bear this in mind".

At the onset of the Brexit negotiations, CECIMO stood for a strong economic relationship between the EU and the UK based on tariff-less and quota-free trade flows, streamlined customs rules and far-reaching regulatory cooperation. Today, as Europe and the UK transition towards a new partnership amid a worldwide pandemic, CECIMO stands by this commitment. ■







# How Additive Manufacturing helped to fight COVID-19 and what have we learned about supply chain resilience



By Vincenzo Belletti, CECIMO Innovation Policy Manager

***"The additive manufacturing community has provided timely support to the healthcare sector to fight COVID-19. This difficult period can be used by other industries to evaluate their business model and reinforce their manufacturing process with those technologies that improve resilience and production efficiency."***

Stewart Lane  
Corporate Manager  
RENISHAW PLC and  
Chairman of CECIMO  
Additive Manufacturing  
Committee

The high demand for medical devices and personal protective equipment (PPE) that took place during the COVID-19 crisis, caught health care professionals and governments officials around the world unprepared. Due to the scale of the demand, the traditional suppliers of essential equipment were unable to provide immediate solutions. The healthcare sector faced an unprecedented supply chain disruption.

With speed being a priority, the additive manufacturing industry has proved to be uniquely positioned to support the supply chain producing personal protective and medical equipment quickly. CECIMO launched a call for action, on behalf of the European Commission (EC), and collected the details of more than 200 companies ready to contribute to the production of valves (for respirators), masks and other items of primary importance.

The many AM initiatives that were conducted all across Europe to clarify a few important points about the employment of 3D printing for the medical sector. The EC published a first-of-a-kind document called "Conformity assessment procedures for 3D printing and 3D printed products to be used in a medical context for COVID-19". This document represents the first effort at EU level to identify which 3D printed products should be used in the medical context.

Policymakers and regulators were not the only ones to understand the potential of this technology in the fight against COVID-19. The peak of the pandemic in March has shown the importance for hospitals to complement their supply chain with AM.

A good example is the University Hospital Trust (AP-HP) in Paris, France, that has invested in a fleet of 60 3D printers, becoming the largest hospital system in Europe to employ the technology.

The printers have been set up to cover the hospital's internal production, ensuring fast and on-demand manufacturing of essential equipment (such as face shields, masks, intubation equipment and respirator valves). The hospital expects to produce between 300 and 3,000 items per week, depending on the type of equipment and its complexity.

Such an example should lead the way for other health structures to adopt smart and beneficial AM solutions that permit a rapid production of crucial missing equipment, or parts of it, whenever needed. The healthcare sector was not the only supply chain challenged by recent events. Many companies will have to reevaluate their business models and adapt to this "new normality". Integrating AM could help many businesses to find local, fast, and efficient solutions to mitigate supply chains disruption. But this shift cannot be implemented overnight.

All sectors need to take at least three steps before trying to approach AM:

1. Review single companies' business: identify areas of risks opportunities.
2. Reaching out to AM experts to help assessing the issues faster.
3. Adopt holistic approaches, beyond the consideration of unit costs and evaluate where AM can appport a valuable difference to the business, in terms of increased production capability and resilience.

In conclusion, COVID-19 has pushed many sectors to reevaluate their business models. Additive manufacturing can play a crucial role in creating more resilient and responsive supply chains, but it is only a part of the bigger picture. This health crisis has urged businesses to broaden their horizon and to explore new solutions to mitigate the risk of future supply chain disruption. ■





# Faster, more collaborative, quicker to scale: how COVID-19 changed manufacturing forever

By Fabio Annunziata, Head of Strategy & Planning, HP

The response to the COVID-19 pandemic has shown that innovative new products can be designed and made at speed thanks to 3D printing.

Anyone who ever wondered how fast manufacturers could innovate and bring new products to the market received an answer, in a matter of weeks, in the first half of 2020. When governments and healthcare providers around the world realised the scale of the public-health challenge facing them caused by the coronavirus, they sent out a call to action for companies that could produce quickly PPE and other equipment such as ventilators and respirators.

The manufacturing industry answered that call, from experienced and specialised producers of medical devices, to manufacturers of vacuum cleaners and construction machinery, to designers and

machinists. Everybody rolled up their sleeves and got to work.

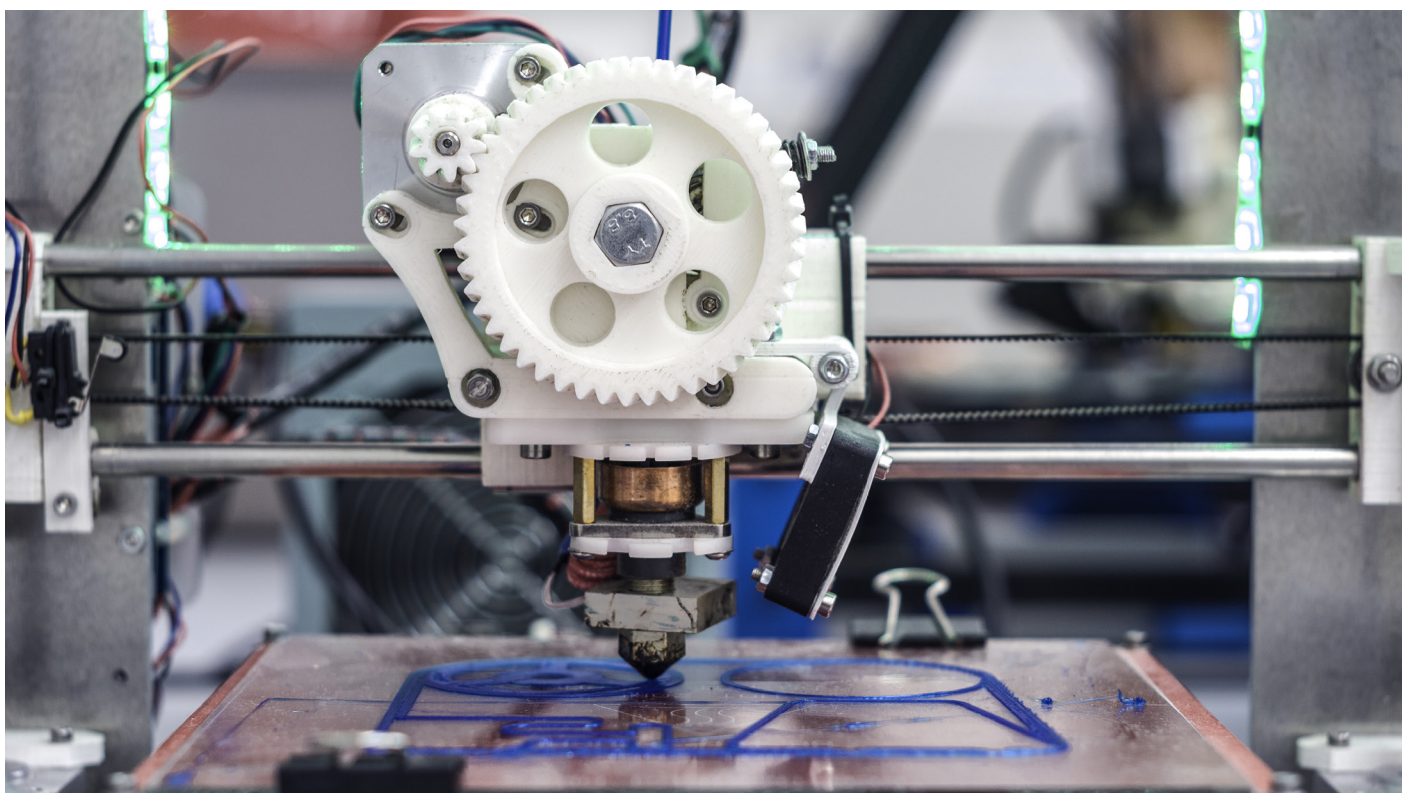
In the US, to mention an example, the Army Research Laboratory created a 3D-printed, portable handheld gas ventilator. In Spain, the manufacturer Leitat developed the first industrialized 3D printed emergency respiration device to support hospitals and ICUs.

HP played a crucial role in these efforts around the world. Together with its digital manufacturing community, HP and its partners have supplied more than four million 3D-printed parts for the healthcare sector during the pandemic. HP mobilized its Multi Jet Fusion technology, digital manufacturing experience, and production capacity to produce a big variety of parts including PPE, ventilator parts, and nasal swabs.



*"The new European Commission aims to put forward a comprehensive strategy for sustainable and smart mobility which is aligned to its zero-pollution ambition. CECIMO supports the EU transition to sustainable, digital and innovative mobility solutions. Nevertheless, CECIMO calls EU regulators to remain technologically neutral."*

Fabio Annunziata  
HP





3D printed parts of respirators produced by volunteers in April 2020

So how will the invigorated interest in 3D printing change manufacturing in the wake of this pandemic? Here are four predictions:

1. Now that everyone is much more conscious of supply-chain vulnerability, distributed manufacturing is going become more attractive

Even before the pandemic, companies have been experimenting with using 3D printing to move manufacturing closer to consumers. New Balance, for instance, opened factories in the US, making personalised insoles for performance runners. We can expect interest in this sector to grow quickly, and not only for the cuts in costs, product-miles, or to avoid seeing vital medical equipment getting stuck in long lines at the border. 3D printing has clear advantages over traditional processes, with less initial capital outlay and higher versatility. Distributing manufacturing facilities around the world are rapidly becoming very attractive.

2. If it has been done so fast in this occasion, it means that we are able to do it

The race to the manufacturing of ventilators and PPE equipment was inspiring. It was also revealing. Companies, including HP, designed, prototyped, tested and brought to market highly complex and heavily regulated products in a matter of only few weeks. If they are capable of doing this in cases of emergency, it means that they are able to offer the same services to customers and shareholders. The real-world COVID-19 examples show that 3D printing can play a crucial role in

accelerating the development process.

3. New processes will foster innovation and collaboration

In Spring 2020, UK appliance maker Dyson teamed up with Melbourne-based technology company TTP to design and produce 15,000 ventilators. In India, HP worked with AgVa Healthcare and other partners to print millions of ventilator components and PPE items in less than a month<sup>X</sup>. Collaboration in the development of new products and technologies was already accelerating before the virus. In 2015, the Boston Consulting Group found that 65% of companies classed as "strong innovators" were collaborating with others. By 2018, this percentage had risen to 83% Because they are so easy to reconfigure for each new job, 3D printers are the perfect tool for collaborators working on complex design problems. We can expect interest in 3D prototyping and production to rise as collaboration continues to increase.

4. Sustainability will motivate more companies to adopt 3D-printing

3D printing has the potential to make manufacturing processes far more environmentally sustainable. Creating parts close to source cuts down freight miles. And additive processes often generate less waste than subtractive ones.

Firms have the chance to be more sustainable while being able to react faster to changing customer preferences and demands. This is a win-win situation for the environment, the consumer, and the bottom line. ■



# Embedding Additive Manufacturing into industrial value chains – an opportunity to fill the gaps in traditional supply chains

By Dr. Bernhard Mueller, Spokesman, Fraunhofer Additive Manufacturing Alliance

(with contributions from Philipp Imgrund, Fraunhofer IAPT, Florian Lehmann and Markus Oettel, Fraunhofer IWU, Mathias Rotgeri, Fraunhofer IML and Moritz Wollbrink, Fraunhofer IPT)

In times of the pandemic, global supply chains have been massively disturbed. Not only regarding medical equipment, medicine and other goods that could directly relieve impact of the pandemic, but for all types of products. It can be clearly seen how vulnerable today's global supply chains are when it comes to foresee crisis situations. In Additive Manufacturing (AM), new opportunities have opened up as follows:

- Additive Manufacturing is able to instantly and locally manufacture goods for emergency supplies, like in the case of needed personal protection equipment (e.g. face shields) and hospital demands (e.g. respirator equipment from masks through splitters and valves up to entire, simple emergency respirator systems).
- Additive Manufacturing can step in when single parts of complex assembly products are missing due to interrupted global supply chains, especially from overseas, low-wage countries, where the COVID-19 pandemic has led to early or enduring production and shipment interruptions and delays.

In the long run, AM has the chance to be established as an on-demand, short distance secondary sourcing option for many types of parts within complex products. Today's cost gap between expensive, locally EU-made AM parts and low-regulated mass production far away from the location of the demand, can be justified by factors like supply security, low transportation cost, no storage cost etc. In this situation, especially in Europe, the AM integration into complex manufacturing process chains and entire value chains would constitute an ideal solution.

Fraunhofer, as Europe's largest organization for applied research, is

playing an important role in this process. For Additive Manufacturing, Fraunhofer has bundled its expertise and know-how from 20 different Fraunhofer institutes into the Fraunhofer Additive Manufacturing Alliance (Fraunhofer GENERATIV) as an umbrella covering all major dedicated AM research activity at Fraunhofer, also acting as a one-stop shop for industry companies and research partners looking for AM expertise. AM research topics at Fraunhofer GENERATIV cover Engineering (to invent and design new products and develop suitable process chains), Materials (to adapt new materials from polymers through metals to ceramics), Technologies (to achieve cost-efficient processes from laser-based through jetting to bio printing technologies), Quality (to control and ensure manufacturing reproducibility and product quality) and Software & Simulation (to develop intelligent algorithms and apply simulation efficiently).

On the one hand, in the days of acute lock-down and pandemic-caused crisis in Europe in spring of 2020, Fraunhofer GENERATIV was able to play its part in providing 3D printed emergency supplies. Fraunhofer GENERATIV supported an appeal for help from the international network for industrial 3D printing "MGA Medical" to provide 5,000 3D printed face shields to the first responders of the German Johanniter-Unfall-Hilfe. While 50 different producers took part in the appeal, bringing together some 5,000 face shields, more than 550 out of those have been additively manufactured at the Fraunhofer institutes EMI, IAPT, IGCV, IPA, IPT and IWU, following a call from the Fraunhofer GENERATIV office to its member institutes, and funded by the Fraunhofer headquarter under its Anti-Corona program.



Dr. Bernhard Mueller  
Fraunhofer Additive  
Manufacturing Alliance





Selective Laser Sintering (SLS) as well as Fused Filament Fabrication (FFF) have been the AM technologies of choice to produce the face shield components. Simultaneously, Fraunhofer IML re-engineered an open source file for face shields to optimise it for SLS, increasing one print job's output from 60 to 500 face shield components. This way, another 1,500 could be manufactured and supplied to local hospitals and doctors in the Dortmund region. For mid-term demands, Fraunhofer IAPT has developed MobiMed – a mobile production line for medical equipment and facilities in crisis regions – integrating data management, polymer AM technologies and medical quality assurance including sterilization and packaging into one unit, housed by a 20 ft container, to be shipped everywhere in the world.

On the other hand, Fraunhofer GENERATIV and its member institutes support the long-term approach of integration of AM into complex value chains und production lines, by several project initiatives. First of all, Fraunhofer is running its own, internal lighthouse project "futureAM" which joins forces of six Fraunhofer GENERATIV member institutes (ILT, IAPT, IWS, IWU, IFAM and IGD) to address the four major challenges of metal AM production readiness – digitisation along the entire process chain, increase of build rate and components size, process monitoring and automation incl. post processing and increase of material diversity incl. multi-material processing. In post process automation and handling, AM

component identification plays a crucial role to safely handle AM parts along the value adding process steps. Within futureAM, Fraunhofer IWU researchers have imprinted ID codes internally into AM parts (e.g. 1D and 2D barcodes in medical implants) during their additive manufacturing. After that, several methods of reading these codes have been evaluated and further developed, including eddy current, ultrasound and x-ray.

In addition, Fraunhofer GENERATIV member institutes have joined large project consortia to integrate AM into digitalised industrial process chains, following a call from the German Federal Ministry of Education and Research for AM production line integration. Fraunhofer ILT and IPT contribute to the IDEA project (Industrialization of Digital Engineering and Additive Manufacturing) for the realization of a fully integrated, automated production line for metal AM, with IPT focusing on automation concepts for component handling, software for removal of support structures and for automated process chain evaluation. Equivalent to the IDEA project with its focus on metal-based AM, the POLYLINE project (Integrated line application of polymer-based AM technologies) focuses on the automation and integration of laser sintering of polymers along the entire process chain. While Fraunhofer IML investigates an integration concept and material flow, Fraunhofer IGCV takes care of the digital process chain and technical cleanliness within POLYLINE. ■



# Latest update on IoT in production

By Alexander von Paumgartten, Senior Consultant, Roland Berger  
& Bernhard Langefeld, Partner Operations, Roland Berger

Within the next decade, the "smart" factory will become reality: most OEMs already manufacture products with embedded smart chips that facilitate AI (Artificial Intelligence) capabilities and IoT (Internet of Things) connectivity.

New technologies like 5G and edge devices will even enable those products to send data to a cloud without necessarily having to use conventional industrial communication networks. This will allow OEMs to analyze their products while in operation, which, in turn, will lead to better evolutions in production, higher customer satisfaction and more reliable products. In this context, OEMs especially are facing several specific challenges: They have to work with standardized communication protocols and cloud-based IoT solutions for production

IoT technologies that will enhance interoperability and create added value for customers.

New data storage, transmission and processing technologies will accelerate the use and dissemination of IoT in the production industries in the upcoming years. Three key technologies are:

- Edge devices: edge devices control the flow of data between two networks, e.g. between a factory network and an IoT cloud. Due to security aspects, limited transmission speed to the cloud or cost, it currently makes sense to process and store

data locally on edge devices. With edge computing, data cleansing, aggregation and analyses – such as event processing, machine learning and artificial intelligence models – are performed on the edge device, not in the cloud itself. This will result in reduced latency and bandwidth costs, faster response times and reduced traffic. Edge devices are connected to an IoT cloud via WAN, LAN and Wi-Fi for production operations, but technologies such as LPWANs and 5G are also possible.

- Low-power wide-area networks (LPWANs): many devices connected to IoT transmit only small amounts of data, so they will require only a low bandwidth. Technologies like 4G/5G consume a lot of power and are highly complex, therefore making them expensive. LPWANs, instead, focus on connecting many low-cost, long-life devices that require broad coverage. Sigfox is recognized as the global LPWAN pioneer in the IoT segment. Some devices can operate for up to 20 years on just two AA batteries because they only become active when sending such simple messages as machine consumption data, or tracking or geotargeting codes. LPWANs enable companies to collect data almost effortlessly without spending time and money on meter readings or manual data processing, while also generating deeper insights into their processes and revealing unknown potential for improvement.



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- **5G:** 5G is the latest in mobile connectivity and offers a transmission speed of more than 10 Gbps, which is about 100 to 1,000 times faster than 4G/LTE. In addition, more devices can be connected simultaneously without fear of network congestion. Network operators worldwide are currently investing hundreds of billions of dollars in 5G infrastructure and plan to implement the required infrastructure with full network coverage by 2025. Because such local networks are relatively easy to install and can support a large number

of devices, 5G is ideal for use in factories. However, 5G will not play a role in all areas of the manufacturing industry. The cost of using 5G in an industrial environment cannot at this time be reliably estimated, making it difficult to calculate investments and industrial business models.

Companies are currently confronted by market, business model, cultural and organizational challenges, and many customers don't really know where to start with IoT. For a successful commercialisation of an IoT product, several key aspects need to be considered in the business model design, the go-to-market approach, the solution architecture, product deployment, and the operating and maintenance phases.

There is no doubt that IoT will become a major cornerstone of Industry 4.0. Nevertheless, the introduction of this technology in manufacturing industries will be on an evolutionary basis, not a revolutionary one.

Most likely, most OEMs will manufacture products with embedded smart chips with IoT connectivity within 10 years. Technologies like 5G will enable these products to send their data into a cloud without touching traditional industrial communication networks. IoT will thus help OEMs to manage, update and analyse their products in use, resulting in higher customer satisfaction and more reliable products. ■







RESEARCH  
AND TECHNOLOGY

This project is co-funded  
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# TRINITY Digital Innovation Hub. Your European one-stop shop for agile manufacturing

By Alessandra Zini, CECIMO EU Policy Officer and Projects Coordinator

As we are approaching the end of the second year of the project TRINITY, funded in the framework of Horizon2020, the European Commission programme for Research and Innovation, we are already collecting a number of success stories. After having evaluated more than 150 applications submitted for our first round of open call, selected SMEs are now in the process of developing their own innovative robotic applications for agile manufacturing and implementing them in the supply chain.

Thanks to a series of online events, we are showcasing robotic applications in different industrial contexts, such as in support of Additive Manufacturing technology, sensors and visions, and human-robot collaboration, just to mention a few.

You can read some of the SMEs success stories in this section of the magazine and visit the TRINITY DIH website at [www.trinityrobotics.eu](http://www.trinityrobotics.eu) for more information on the project and our next open call. ■



This project is co-funded  
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# WAAM CLAMP: Hybrid additive manufacturing to reduce production lead time by MX3D

By René Backx, CCO, MX3D

Short lead times are key for repairing (potential) pipeline leakages in the oil & gas industry, both to prevent downtime/interruptions and to decrease safety risks. These leakages are primarily solved by metal clamps around the pipeline to enclose it and prevent gas/fluids from escaping. As pipes come in different shapes and sizes, these clamps are frequently custom made. Traditionally, these clamps are manually welded and/or CNC milled. While specialized welders are becoming scarce and CNC milling has high material waste (on average >80% of original material), additive manufacturing (AM) can provide an attractive solution.

Robotic Wire Arc Additive Manufacturing (WAAM), a large-scale metal 3D print technology that uses an arc welding process to produce metal parts additively, has the potential to shorten the lead time of producing the clamps as the manufacturing can be fully automatic with less material waste. Moreover, WAAM enables new/optimal shapes that cannot be done with traditional manufacturing. Furthermore, the printing production can be done on-site and with multiple robots, decreasing the lead time further. On the other hand, WAAM has two potential disadvantages that could increase the lead time, as both post-processing and part inspection is required afterwards.

This research aims to tackle both disadvantages by creating hybrid manufacturing where additive manufacturing technology prints on pre-produced metal components to prevent these selected parts from being post-processed and inspected afterwards.







As a result, a fully functional pipeline clamp will be built from pre-produced metal components and additive manufacturing for the remainder of the part.

The consortium strives to demonstrate an alternative agile manufacturing technology based on WAAM technology that is potentially faster, cheaper and more flexible than traditional manufacturing. Moreover, WAAM has the benefit of higher production speed and lower costs compared to other 3D metal printing technologies such as Selective Laser Melting (SLM), creating an attractive alternative manufacturing technology.

The Trinity consortium of TEAM Industrial Services, MX3D and TiaT Europe incorporates key value chain partners. TEAM Industrial Services has the application engineering expertise, MX3D advanced WAAM and printing capabilities, and TiaT Europe specialized inspection and testing capabilities. By joining capabilities, the consortium aims to demonstrate this value proposition of hybrid AM while adhering to strict industry standards.

By conducting the research and creating the demonstrator, the consortium aims to accelerate the adoption of large-scale additive manufacturing in the oil & gas industry. Taking into account the industrialization and certification requirements in the sector, this demonstrator will open up new thinking on alternative manufacturing technologies to reduce material waste and lead time. For industries that frequently use complex metal parts (e.g. oil & gas, maritime, mining, utilities, energy) and where fast repair of unplanned downtime is essential, hybrid WAAM will add an alternative, more agile and fast manufacturing technology, in particular at remote locations. ■





# EACHPack Project – A step forward for small-scale logistic facilities

By Nicola Castaman, R&D Developer, IT+Robotics and Ph.D. Candidate, University of Padova

The growth of e-commerce is leading to the explosion of shipments of small postal packages weighing less than 5kg. Besides, shipping companies have to balance between a low cost to their customers and a demand for even faster shipping. This poses a huge problem, and also an opportunity for those who seek to provide innovative solutions in logistics worldwide.

Small parcel sorting is still a manual process that requires to pick up each package from a container, put it under a tracking system that checks the package transit, measures weight and volume, and places them on specific outgoing containers according to its destination. In incoming parcel posts handling, operators are subjected to repetitive 3-4 hours work shifts, in which they arrive to handle up to 400 packages per hour.

Systems based on 2D or 3D vision technologies are widely used in many applications, but they work with objects that have a defined model and a known shape.

Parcels, and in particular envelopes, do not have a reference model for locating them and they are often called model-less objects.

EACHPack (End-to-end Automatic Handling of Small Packages) project proposes a solution able to respond to these challenges, with the support of

Trinity funding.

IT+Robotics leads the development of such an ambitious project, combining the academic experience of the Intelligent Autonomous System Lab of the University of Padova and know-how in the logistic field of AgileVision.

EACHPack exploits innovative machine vision algorithms based on Deep Learning to reach this goal, with the aim to potentially provide a complete robotized system to small and medium delivery structures, a system capable of performing the incoming parcel posts sorting process in an end-to-end fashion. Indeed, the proposed solution can recognize, localize, and handle deformable and non-fixed size objects such as the parcel post.

Due to the lack of robotised solutions able to effectively perform the small parcel sorting process, a significant number of small delivery facilities are potentially interested in the proposed system (around 250 only in Italy). Moreover, enabling small delivery facilities to robotise the avoid people to do repetitive tasks without added value.

We feel the market is going to be ready for opportunities in this field of automation and, thanks to Trinity, EACHPack represents a strong proposal that could significantly improve shipping companies' operation. ■





# Automating AM at scale

By Robert Bush, Founder Additive Automations

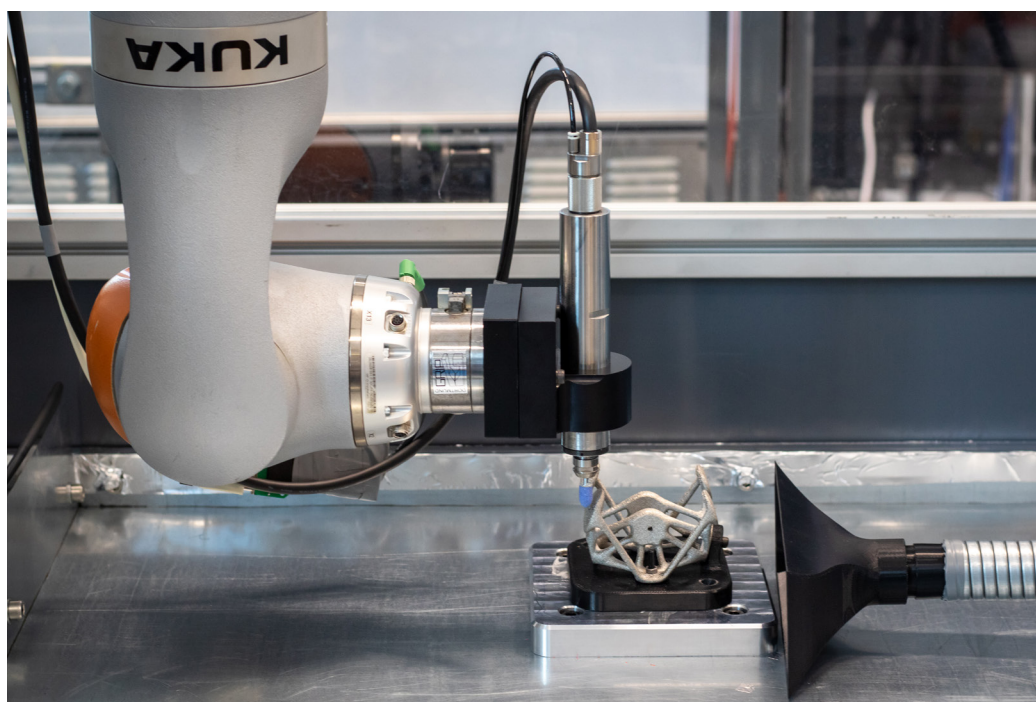
TRINITY has announced a collaboration with Sheffield-based start-up Additive Automations to automate the post-processing step for metal 3D printing and deliver a more cost-effective solution for volume production.

The project, named Separation of Additive-Layer Supports by Automation via 2-way digital twin (or SALSA2d), aims to reduce cost per part by 25% through the use of industrial robots and digital twin technology. The process works using integrated force and vision sensors which collect data to determine part geometry. This data is then analysed by software to determine the location of support structures which are then removed using an end-effector tool.

"Automating support removal and finishing in AM completely changes the economics when scaling up AM, and for the first time makes it feasible for manufacturers around the world to adopt this technology in rapid production," explained Robert Bush, founder of

Additive Automations. "The digitalisation of AM also comes with an increase in quality, traceability and repeatability. Given that on average almost two thirds of post-processing costs are from finishing and support structure removal, we believe automation can reduce costs by an average of 25 per cent per part."

Since its founding, Additive Automations has secured funding from TRINITY, Innovate UK, and the National Research Council Canada and collaborated with both Renishaw and the University of Sheffield Advanced Manufacturing Research Centre (AMRC). TRINITY began working with the company in mid-2020 and is helping them to foster relationships with European companies, navigate the coronavirus pandemic and raise Series A investment in 2021. Renishaw says it began working with the company last year and has provided four examples of titanium parts across medical, oil and gas, automotive and mechanical engineering applications to demonstrate its support structure removal process. ■





This project is co-funded  
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# RoboBend - World's first standard bending robot

By Thomas Ronlev, CEO and Co-founder, RoboBend ApS

RoboBend - is the World's first standard bending robot that solves the problem of finding qualified machine operators, provides higher capacity on company's present machines, lowers production costs and delivers consistent high quality for your clients.

According to interviews conducted with key metal industry players, today there are 1.5 million press brake machines around the globe in the metal processing industry operated by humans, doing repeatable and dangerous work every day. Monotonous, risky work forced the future generations to look for other jobs and industries rather than take open vacancies in the Metal Industry, that resulted in severe labour shortages – European Commission's market data analytics company Skills Panorama predicts 2.7 million unfilled metal machinery job vacancies in the EU by 2030. Probably the best solution to this challenge is using robots that replace humans in controlling the press brake, solves safety issues and allows workers to work in other parts of production.

RoboBend is designed to make it simple to use at any production environment, for any worker with no special training. First, the operator specifies the piece that needs to be bent through an easy-to-use user interface. This process is repeated only for new pieces since all information is stored and can be accessed from the cloud server. The robot starts operating – it picks up prefabricated pieces from the feeder system with the robot arm and relevant gripper (vacuum, mechanical, electromagnetic), places them in the bending machine, takes them out once bent, and neatly stacks them on a pallet. It operates until all prefabricated pieces are bent and the feeder cartridge needs to be replaced.

An important component in RoboBend is the press brake control interface (RBMi) – the brain, which has embedded the software giving an "intelligent solution"

and allows RoboBend to work with any existing press brake on the market. This is a key feature and makes RoboBend easy to implement and to use – providing the robot control over the machine, easy programming interface, quality control and at the same time is based on Industry 4.0 philosophy, making it possible to integrate data from the cloud and from other sources to optimize both the set-up and daily machine performance.

RoboBend ApS has recently participated and successfully received funding from Trinity DIH open call to facilitate and grow advanced robotics for agile production. "Co-operation with Trinity DIH consortium and its network partners opens up many possibilities for growth and solving metal industry challenges. With Trinity DIH funding programme we will be able to create next-generation RoboBend solution that will be able to work with larger pieces (up to 1,5 meters), it will have new software and user interface for faster batch production and a much easier programming process." - states CEO of RoboBend ApS Thomas Ronlev.

All in all, the next generation RoboBend solution will enable smaller batch production and open up more possibilities for companies that work with many different metal pieces and smaller batch orders. This will make RoboBend even a better business case for SME companies and will make their production more efficient and agile.

RoboBend is the world's first standard bending robot that provides an excellent business case for companies that are facing qualified operators shortages and are looking to increase their productivity. Robobend can bend more pieces than the human operator, so companies can increase bending capacity on your existing press brake machines. It works autonomously and delivers consistent high quality every time. ■



Thomas Ronlev  
CEO and Co-founder  
RoboBend ApS





# ICON: Improved automation of electric motors manufacture

By Stefano Ellero, Area Manager, STAM

Small manufacturers of electric motors need to stay agile in their offering, in order to face quick changes in requests from customers and be flexible towards great variations in the design of the products they make. Collaborative robotics is the right approach to address this need, because it is more flexible than rigid automation, more suitable to manufacture small, different batches of motors and allows manufacturers to take advantage of automation speed and repeatability and human flexibility.

ICON's objective is to improve a robotic cell for coils winding, developed by the demonstration partners STAM and ICPE, by deploying three TRINITY-originated Human-Robot Collaboration (HRC) and Artificial Intelligence (AI) modules.

In the current setup, automation is covering large part of the process; the only steps performed by the operator are pre - and post- works on the wire (wire routing). Since the cell is based on an industrial robot, during the automatic cycle it is closed by a safety fence. In order to perform the pre and post winding actions, the operator is allowed to enter the robot area only if the cell has come to a complete stop. This results in robot non-operative time and reduces the

cell productivity.

Moreover, the cell addresses winding on stators with different sizes and design. Currently, the user inputs the stator parameters on an HMI, which are translated into robot trajectories. If the user input does not match the stator that was physically loaded, there is possibility of collision and failure of the system hardware.

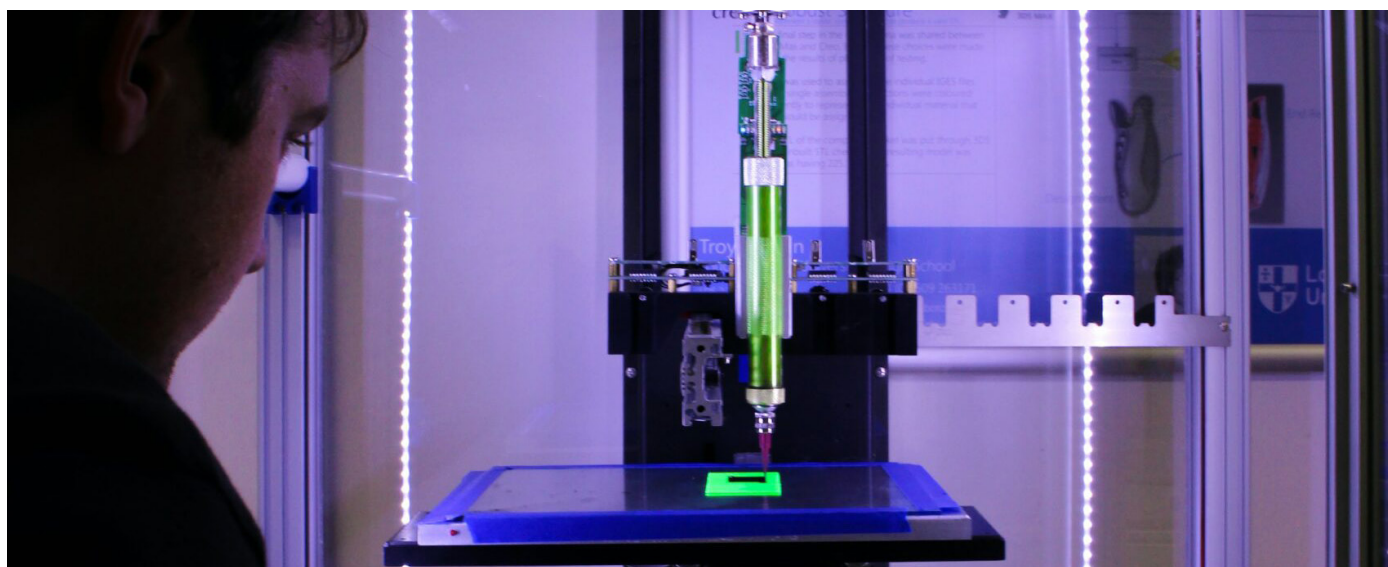
In the ICON demonstration, continued and mistake-proof production will be ensured exploiting the HRC and AI modules developed by TRINITY:

- The operator can work alongside the robot, whose speed is reduced, thus avoiding cycle stop. To reduce the accident risk, we will integrate the module "Safe Human Detection in a Collaborative Work Cell", which uses a safety laser scanner to detect an operator in the robot working area. The controller continuously monitors the sensor input and reduces the robot speed accordingly. This would allow an operator to do the wire routing on a completed stator while the robot starts a new cycle on another stator.
- We will deploy an efficient and flawless HRC process by exploiting the module "Projection-based Interaction Interface for HRC". The

module will project command buttons, winding instructions and the real time robot workspace on the operator's work bench. This will also allow non-expert users to operate the system.

- Finally, thanks to the module "Object Classification", we will verify that the user input matches the actual stator geometry. An AI classification algorithm will be integrated to identify the stator, allowing to validate the operator's inputs before starting the process. This will avoid robot collisions with the workpiece and consequent failures. The algorithm will be trained with a set of known stators, to confirm validity of user inputs and reduce the setup time.

ICON will have many positive impacts on electric motors manufacture. Firstly, the robot non-operative time will be reduced, performing the wire routing actions in parallel to the robotic coil winding. Secondly, the overall cycle time will be shortened and winding failures will be avoided, thanks to the AI-based control of input parameters. These productivity impacts will be achieved ensuring the total safety of the operator, that is monitored by safety sensors and informed about the robot operations through the projection system. ■



## CECIMO endorses the new European Pact for Skills through the SAM project

By Alessandra Zini, CECIMO EU Policy Officer and Projects Coordinator  
& Adelaide Almeida, Project Manager, European Federation for Welding, Joining and Cutting (EFW)

During the European Vocational Skills Week, that took place from 9 to 13 November 2020, the European Commission has launched its new Pact for Skills. This important milestone aims to improve and strengthen the cooperation on skills development between all stakeholders involved, for sustainable competitiveness, social fairness, and resilience of the EU Single Market. Ambitious actions for upskilling (improving existing skills) and reskilling (training in new skills) of the European Workforce for the next 5 years have been placed in the Pact for Skills to embrace the twin challenges of a digital and green transition, as well as to counter the impact that the coronavirus pandemic had on our way to live and work.

Within this context, the SAM project ([www.skills4am.eu](http://www.skills4am.eu)), identified as Blueprint Alliance for Sector Skills Strategy in AM, is setting up large-scale partnership through the engagement of key stakeholders in AM: training providers, industry representatives, and technology researchers and experts are, in fact, working together to provide the European workforce with the right set of skills needed for the growth, innovation,

and therefore competitiveness of the sector. During the launch of the Pact for Skills, the SAM project has presented its AM Skills Strategy Roadmap for 2021, where the main challenges for the AM sector have been identified and addressed. The long term objective of the project, envisioned in the European AM Skills Strategy, is to deploy the International AM Qualification System (IAMQS), through a network of training providers, lead by the long-standing experienced project coordinator EFW, and a wide range of industrial sectors that are applying Additive Manufacturing in their activity or intend to do so.

The IAMQS is, in fact, composed by a set of qualifications for different proficiency levels, grounded on industry requirements and validated by experts. This system is supported by the AM Observatory, currently in its development phase within the project, which will serve to a sustainable and continuous assessment of current and future skills needs, providing real-time mapping and monitoring of the AM industry needs, technological trends, skills shortages and mismatches, as well as policies and figures for the sector.

The expertise within EFW will then make sure that the quality assurance system guarantees the relevance and competitiveness of the IAMQS and its harmonisation, meaning that the same training contents and assessment procedures are valid regardless of the country in which the training is taking place. Moreover, the Sectoral Framework that is currently in use ensures the smooth alignment with both National (NQF) and European Qualifications frameworks (EQF), fundamental to give to the strategy a European dimension.

The project has set itself ambitious goal, such as guaranteeing the qualification of at least 100.000 AM workers by 2030, including upskilling / reskilling of the existing workforce, the creation of a Network of Training Centres and infrastructures in AM, and the design, review and roll out of 100 new skills in AM by 2025.

The strategy has received the support of several CECIMO National Associations, highlighting the importance of the involvement of the Industry in creating ad-hoc upskilling, reskilling and trainings for the flourishing of the sector. ■





# SAM: Why a new strategy for skills in Additive Manufacturing is important for the Industry

by Sean McConnell, Senior Technologist, Irish Manufacturing Research

Additive Manufacturing is catching on. This may seem implicit given the hype and investment that is present in the industry, but with CAGR's of 25%+ being touted<sup>1</sup>, it is no wonder that many of us adopted the various AM associated terms into our lexicon. Think topology optimisation, biomimicry, anisotropy.

Words that a lot of us are not yet using in our AM conversations are that of; reliability, repeatability and scalability. This is not to say that many companies are not engaging in these activities, but more to say that if we are to truly realise the potential of this technology, we must take the novelty it brings with a healthy dose of traditional engineering realism.

A core tenant of scaling a manufacturing process is that of standardisation. In order to ensure compliance and scalability we must first ensure that all aspects of the process are captured, understood and standardised. As the various working

groups within ISO/ASTM F42 TC 260 work hard to create the standards we all need for this technology, we also need to ensure that the skills and qualifications of the individuals working on this technology are standardised. This is where projects such as SAM and the greater effort of the International Additive Manufacturing Qualification System (IAMQS) come in.

SAM is an initiative funded through the Erasmus+ programme to develop out industry specific qualifications and the governance model for the proliferation of said qualifications under the IAMQS. Having been funded through the EU, the project is actively engaged with industrial partners, with some forming part of the project consortium. This is critical as the purpose of the project is to serve the existing and coming requirements for qualifications for AM training across all industries in Europe. Without the active participation of industry, projects such as

this may run the risk of not satisfying the requirements of industry.

Anecdotally, we have seen companies beginning their AM journey looking for generalist staff to design for, operate and control this production process. In an ideal world these people exist and are transferable across the entire process chain, unfortunately the depth of knowledge required to get the best out of the process is such that it is not possible to fill a factory with generalists. This is where projects such as SAM come into their own. By providing role definitions and qualifications devised from industry led forums and workshops, we can leverage a system that makes the scaling of human capital for this technology possible, alleviating the difficulties in training new and existing staff. This in of itself has made projects such as this extremely relevant to industry. ■



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<sup>1</sup>AM Power, 2020, <https://additive-manufacturing-report.com/additive-manufacturing-market/>



DIMOFAC

This project is co-funded  
by the European Union



# Digital & Intelligent MODular FACTories

By Frédéric Melchior, CECIMO Director Technical Regulation

Manufacturing is facing important new challenges. To mention one, more than one-third of consumers today prefer customisable goods and services to the traditional ones, choosing to pay more for the extra personalised features. We are quickly moving from an era of mass-production to an era of mass-customisation, and flexible and reconfigurable production lines are becoming vital to respond to customer expectations. But factories, regardless of their size, face financial and technical obstacles on their way to more responsive production lines.

The Horizon 2020 project Digital & Intelligent MODular FACTories (DIMOFAC) came to life to assist factories to overcome these challenges.

The DIMOFAC project began its journey in October 2019 it will last for a total of four years. The project, supported by the European Commission (maximum grant of €14.163.497,67), is composed of a consortium of 30 European partners led by the French Alternative Energies and Atomic Energy Commission (CEA). The partners of the consortium are working together on testing, validating and disseminating a homegrown technology and process (the DIMOFAC Modular Factory Solution) meant to make assembly lines more flexible and more reactive to sudden and rapid changes in demand.

It is estimated that the DIMOFAC Modular Factory Solution will enable factories to:

- Reduce by 15% the time it takes to reconfigure their production lines.
- Decrease by 10% the resources (raw materials, energy, fluids, manpower) used for the production process.

- Lower by 15% the overall cost of production.

In the medium term, such benefits will translate into the creation of more skilled jobs, a boost in growth and a lower environmental impact.

As a partner of the DIMOFAC project, CECIMO's role is of referent concerning matters related to standardisation. CECIMO's main task is to ensure that the DIMOFAC project's activities are in line with the developments in the smart manufacturing landscape from a perspective of existing standards and in development of standards at European and international level. For this purpose, and in cooperation with other standardisation participants in the DIMOFAC project, CECIMO is leveraging its established connections within the standardisation community.

As the European association representing machine tool industries and related manufacturing technologies, CECIMO has been contributing as a leading partner in a variety of standard-related platforms. To mention one, CECIMO has been part of the Working Group on standardisation, in support to the Digitising European Industry initiative, created by the European Commission to accelerate the transition of European smart manufacturers towards digitisation. CECIMO has also numerous partnerships as a liaison body with international organisations focused on smart manufacturing. All in all, CECIMO's strategic position within the smart manufacturing community guarantees a strong link between the DIMOFAC project and the array of current and expected standards in this field. ■





# PeneloPe: transforming the European industry

By Alessandra Zini, CECIMO EU Policy Officer and Projects Coordinator

The manufacturing of large-scale parts needs the implementation of a holistic data management and integrated automation methodology to achieve the desired levels of precision using modular and more flexible equipment. Large-parts manufacturing requires a high degree of personalisation, which implies a greater effort in the design and manufacturing ex-post verification to achieve high precision. Moreover, this customised product-centric design requires an optimisation of the resources of the workshop – such as workers, machines and devices— for a responsive, reconfigurable and modular production, targeting the execution of key labor-intensive tasks by preserving industry-specific workers' knowledge and skills (worker-centric approach). PENELOPE has foreseen three main purposes of the project, namely creating digital pilot lines, training of the workforce, and a benchmarking approach for the wider industrial ecosystem.

Driven by the challenges that this type of product manufacturing process is now facing, PENELOPE aims to implement a digital manufacturing architecture for an accurate, flexible and responsive manufacturing of large-scale parts from the initial product design. PENELOPE will be deployed in four industrial-driven pilot lines in strategic manufacturing sectors (Oil&Gas, Shipbuilding, Aeronautics, and Bus&Coach). Specifically, IDESA, MV, FOKKER, and VDL will make available their facilities to host and test the novel pilot-lines.

To achieve comprehensive and successful results, the project is supported by a pan-European network of Didactic Factories and showrooms, providing the following

expertise and services:

- training, upskilling and re-skilling capabilities enabling the transition towards Industry 4.0 of the EU manufacturing industry and its workforce.
- general-purpose testbeds for assisting in the industry adoption of modular and reconfigurable manufacturing of large-scale parts.
- production performance, quality and accuracy while ensuring workers' safety and resource efficiency.

The digital pilot-line aims, in fact, to leverage the potential of Artificial Intelligence (AI), Internet of Things (IoT), mobile and ubiquitous ICT tools, and robotics, as they represent the backbone for novel connected factories— linking product-centered data management and flexible and reconfigurable production planning— and they offer the European large part manufacturing industry the opportunity to stay competitive worldwide.

Finally, PENELOPE will provide advanced manufacturing production technology benchmarking to Europe manufacturing industry through the release of sectorial documentation (project technologies benchmarking and analysis), aiming at a wide replicability of the project results into the EU manufacturing industry for the benefit of the entire European industrial ecosystem.

31 partners based in 10 European countries kicked-off the project on the 15 and 16 of November. PENELOPE counts an overall budget of 21 million euros to be spent in its 4 years duration for the implementation of its objectives. ■





# Meet a CECIMO Delegate: an interview with Monika Šimánková, CEO, HESTEGO a.s.



Monika Šimánková  
HESTEGO a.s.

***What are your reasons for joining the CECIMO community and what are the most valuable benefits of being a CECIMO member?***

CECIMO is the European Association of the Machine Tool Industries and related Manufacturing Technologies. As a member of this association, I have the opportunity to help develop this segment of manufacturing. CECIMO provides me with access to up-to-date economic data and insightful analysis of European policies that directly affect our sector. Furthermore, through CECIMO, I can meet with fellow colleagues from other companies and discuss with them all sorts of topics, such as business developments or technological innovation trends. As I see it, CECIMO is well prepared to represent our industry in Europe and convey our needs to European policymakers both clearly and efficiently.

***What does digitisation mean for the machine tool industry and what are the main challenges of the digital transition?***

If implemented in machine tool manufacturing processes, digitisation could significantly increase the productivity of our machines and improve the quality of the current machine tool designs. In the beginning, customers' requests are "digitised", that is, the original design is transformed into a virtual model that comprises the clients' requirements. This is truly a step forward, as it does not require to test-run production or retrofit machines to adapt them to new designs. Digitised models and a consistent collection of production data can make the current manufacturing processes more flexible and correct. These can also finetune designs, so that the final product resembles as much as possible its digital counterpart, which was created based on the customer's needs and specifications.

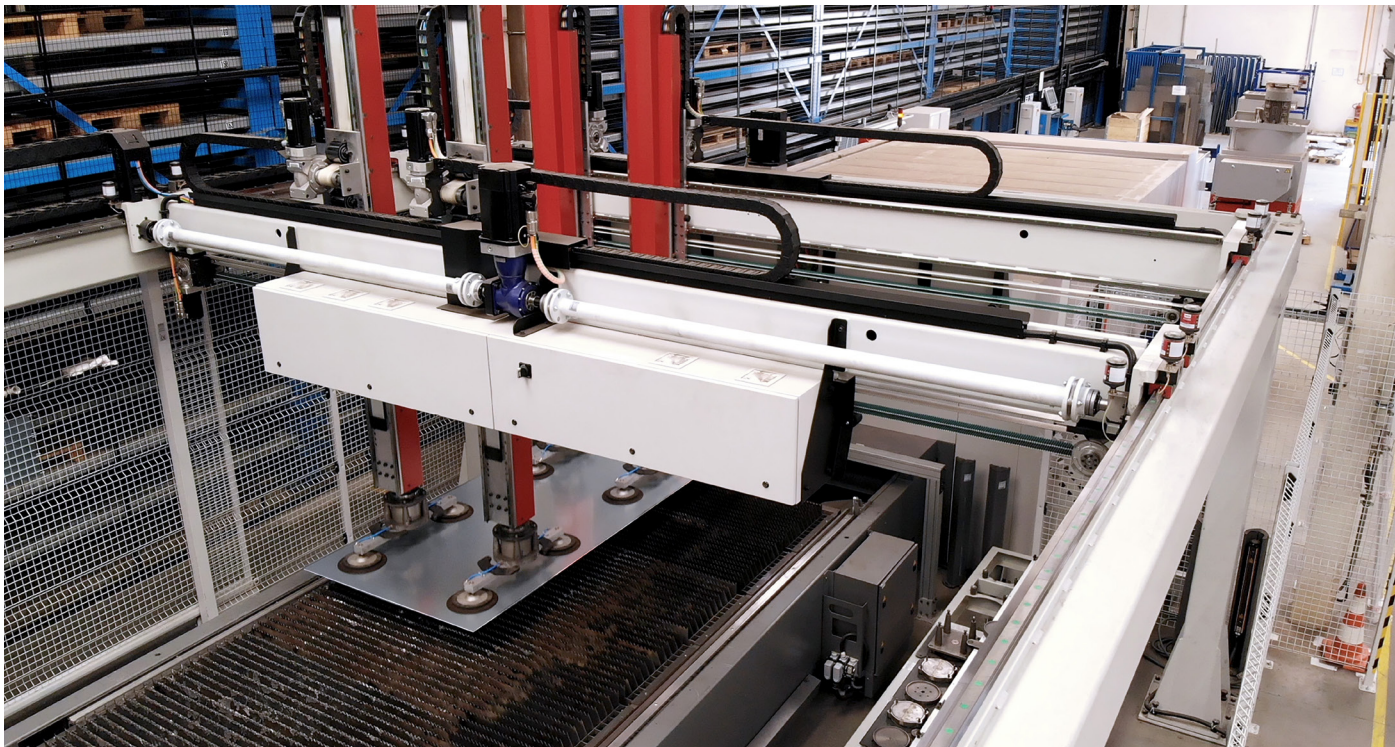
The main challenge of digitisation is to include it in all stages of the machine tool manufacturing process, whether it is design or production. Therefore, virtual components must be available from the start. When combining these components into the machine control system, the sensing and behavior system must also be updated, so that automatic corrections can take place, such as the gradual wear of the components. Many subcontractors are requiring these new specifications.

***What policies should the European Commission propose to help the machine tool industry meet all the challenges that lie ahead?***

European Union policies are key to help develop the machine tool sector further. Machinery and components manufacturers will need support implementing the new European proposals on industrial and technological innovation. To do so, policymakers should lay out programs or initiatives that combine the practical competencies of manufacturers with the scientific capabilities of universities and research institutes.

***What is your company and employees doing to adapt to digital changes in manufacturing?***

As a supplier of components for machine tools, Hestego digitises on several branches. For instance, has digitized its own production in the form of an automated stock system of slag. Hestego has carried out a second wave of digitisation by transforming telescopic covers into virtual models and by adding a control system of machine tools. We are currently part of the TRIO3 program, working alongside the Ministry of Industry and Trade on a project called "Energy Efficient Covering for Advanced Production Machines".



From the measuring test station, we collect data on the behaviour of telescopic cover of various sizes, shapes and compositions. By means of this, we will be able to create virtual models, which would then be used in the design of new covers with regard to the lowest possible load on the machine's drive system. As part of the project, we are also working on the implementation of an measuring device into the telescopic cover and its connectivity with the machine tool control system, so that cover informs the machine about the conditions of the cover, feeding the machine useful information that it can use to modify the machining process or to schedule machine maintenance.

***In your opinion, what has been Hestego's greatest success in digital technology?***

Perhaps our biggest success in terms of digitisation was the implementation of an automatic warehouse. It was connected to the SAP information system and also to the control systems of burning and forming machines. Depending on the production requirements, a queue is automatically created for the machines, which is processed by the machines themselves and then stored autonomously in the warehouse towers. Once there, the queued sheet metal parts are gradually completed.

As soon as the order is completed at the specified level by the SAP system and the pickup deadline is due, the components are automatically removed from storage and delivered for subsequent processing.

***Is your company facing a skills shortage? How did you solve this problem?***

Yes. Digitisation demands transferring human resources to the pre-production and development stage. Considering this, we have gained considerable experience and skills thanks to our long-term cooperation with universities. Just to name a few, we have worked the Academy of Sciences, the Czech University in Prague and the University in Brno. Without their involvement in Hestego projects, these would have taken significantly longer to complete and probably would have shown different results.

***What skills will become a necessity in the workplace?***

Knowledge of information systems will become an essential part of the workplace to some extent. We cannot do it without simulations and virtual models, and digital twins will be used to a greater extent in production processes. With this, the requirements for measuring

and controlling skills of workers at individual workplaces will certainly increase. There will also be a need to process data and adjust production to the results.

***How do you see the development of the machine tool industry in the coming years?***

As manufacturers of covers for machine tools, we monitor the increasing demand among manufacturers for greater speed of movement of individual axes. Telescopic cover and bellows must be able to carry out their functions at higher speed than in the past. At the same time, builders place greater emphasis on lighter and more resistant covers. Based on these, it there is a clear need to have faster machine tools, but also with a greatly reduced energy input. Our company is also actively monitoring the requirements for special and specific solutions, which can help provide our customers with tailored products. For this reason, a digitised production will be necessary. Prototypes will be produced virtually, and the physical covers will be built in series. Mastering digitisation will be the first step towards the implementation of artificial intelligence in machine tools, which is certainly waiting for us in the foreseeable future. ■





Mikko Nyman  
Fastems Oy Ab

## Meet a CECIMO Delegate: an interview with Mikko Nyman, CEO, Fastems Oy Ab

***What are your reasons for joining the CECIMO community and what are the most valuable benefits of being a CECIMO member?***

I want to contribute to the positive development of the European and Finnish machine tool and automation sector, and I believe this can only be achieved through Europe-wide collaboration. As a CECIMO delegate, I hope to gain a comprehensive picture of the economic and technological developments of the industry as well as to get to know key players in the industry and build Europe-wide networks. I have already found the economic and statistical toolbox provided by CECIMO to be very helpful.

***What does digitisation mean for the machine tool industry and what are the main challenges of the digital transition?***

Digitisation is a multi-faceted phenomenon but I believe it is always helpful to start with having the customers in mind. Manufacturers benefit from digitalisation through increased inter-connectivity of production machinery, operations and factories as well as by growing transparency and near-endless optimization opportunities. The machine tool sector needs to spearhead innovations and pave the way for manufacturers or otherwise run the risk becoming irrelevant. From regulators, I would hope a level playground ensuring that the European industry can focus on sustainable solutions and remain competitive in both the European and global markets.

***What is your company and employees doing to adapt to digital changes in manufacturing?***

My company Fastems has long held the belief that automation and digitalisation

will revolutionize manufacturing, which is why we have been busy building our own software offering to complement our automation offering. Today, most of our design engineers are focusing on software development. We have also built capabilities to connect our systems in the cloud for remote monitoring, predictive maintenance, and optimizations. In order to make our solutions ever more intelligent, the next step is to apply advanced analytics and machine learning to the data generated.

***In your opinion, what has been Fastems Oy Ab greatest success in digital technology?***

Fastems has been very active in embracing digitalisation of manufacturing. In my eyes, our greatest accomplishment so far has been the launch of our new software offering under our MMS software family. This has expanded Fastems' ability to optimise manufacturing processes from automated cells and systems to the entire factory, including manual operations. And this is only the beginning on our journey to build end-to-end optimised manufacturing networks.

***Is your company facing a skills gap? How have you tackled this problem?***

I believe every company, at least to some extent, is facing a skills gap in the sense that new software capabilities need to be built, which are skills short of supply everywhere. Fortunately, Fastems has been building long-term relationships with universities and has a good employer brand in Finland so we have been able to attract many software professionals of the years. In line with our geographical expansion, the next step is to build these relationships and brand in countries like Germany and the US where our company is not yet so well known.



***What skills will become a necessity in the workplace?***

From my point of view, the most important must-have is a mindset for lifelong learning and embracing change and innovation. The speed of technological development is ever increasing and every skill will eventually become outdated if not maintained. The role of soft skills such as innovating, inspiring, creative problem solving, and collaborating will become increasingly important as automation takes over many repetitive tasks. Skills related to running and developing automated systems are also must-haves for many future roles.

***How do you see the development of the machine tool industry in the coming years?***

In the short to medium term, the COVID-19 pandemic has struck a major blow to the global economy, which heavily impacts the machine tool sector as an industry highly susceptible to changes

in the overall economic development and investment climate. In addition to increased uncertainty that reduces investment appetite, I believe that COVID-19 has accelerated certain changes in customer behavior that were already visible before the pandemic. Manufacturer interest in automation and digitalisation will only increase as automated and digitised factories are safer in situations like these. In a tougher market situation like we are facing now, automation also offers a way to bring down key figures like unit cost or capital tied in inventories and work-in-progress.

In the long term however, I see that the pace of innovation in the machine tool sector is increasing with new technologies becoming available. We have exciting opportunities ahead of us. CECIMO has a key role in ensuring that the European machine tool sector promoting innovation and sustainability has a level playground and a supportive regulatory environment in the European and global markets. ■





# VDW and the German machine tool industry



Dr. Wilfried Schäfer  
Executive Director  
VDW

The VDW (German Machine Tool Builders' Association), Frankfurt am Main, has been the spokesman for the German machine tool industry for more than 125 years. Together with the specialised section Machine Tool and Manufacturing Systems Association in the VDMA, it has around 300 mainly medium-sized members. They represent approx. 90 per cent of the total turnover in the industry, most recently around 17 billion euros.

The association's work rests on two pillars. On one hand, the VDW represents the interests of the industry to the German and international public, politics, business partners and science. On the other hand, it positions itself as a competent service provider for its members in the development of sales markets, economic monitoring and market data acquisition, technical, economic and legal issues, cooperation with the international machine tool industry, research, standardisation and the recruitment of young professionals. Under the current difficult conditions of the Corona pandemic, it is concentrating on maintaining its full range of services. Here are a few examples.

## **Trade fairs and symposia: consolidating the visibility of the industry**

With the seal of approval "A VDW trade fair", the VDW organizes the METAV in Düsseldorf. The International Trade Fair for Metalworking Technologies had to be postponed from March 2020 to March 2021 as METAV 2020 reloaded (23 to 26). In order to provide exhibitors with a platform to stabilise the customer dialogue and to present their innovations under the conditions of Corona lockdown and travel restrictions, the VDW has been organising the METAV Web Sessions since June 2020. They take place monthly with selected key topics, e.g. software, automation and handling, digitisation, etc. Exhibitors present their machines, solutions and services that they would have shown at METAV

2020, thus preparing participants for their visit to METAV 2020 reloaded next March. Cooperation partner is the VDW subsidiary IndustryArena, the largest online portal for the manufacturing industry with international supplier and product information and almost 530,000 users registered worldwide,

In November 2020, VDW, also in cooperation with the IndustryArena, is inviting Indian customers to the first virtual machine tool symposium. Under the motto "Innovations in the Manufacturing Industry - Machine Tools from Germany", members of VDW will be able to present their expertise exclusively to Indian experts over a period of two days. The customers come from the automotive and supplier industries, the electrical and electronics industry and mechanical engineering. The presentations will be supplemented by individual B2B web meetings in form of live chats.

On behalf of Cecimo, the VDW is organizing the EMO Hannover. The next event will take place in September 2023.

## **Industry 4.0: Milestone in the development of the world language for production reached**

In these days, the OPC UA Companion Specification for Machine Tools was published. It represents a milestone for the introduction of Industry 4.0 in the machine tool industry. The specification integrates the OPC UA Companion Specification for Machinery right out of the box. This paves the way for interoperable communication in production. Machine tools as well as other machines can now be easily connected to the company's IT via plug&play. The OPC UA for Machine Tools was thoroughly tested in two "plug-fests" before being released.

This proved that the umati infrastructure offers added value beyond simple trade fair demonstrations, and that we can now also make it available to our partners for development and testing.





With the publication of the OPC UA Companion Specifications, the way is now clear to bring products to market whose communication is based on OPC UA as an open interface. The VDW is now working hard to further expand the international user network umati (universal machinery interface).

#### **New formats in association communication**

All association activities are naturally supported and accompanied by public relations. For this purpose, the VDW uses the entire range of classic and new communication formats. In addition to press releases, press conferences and members' magazines, numerous new formats have been established, such as METAV web sessions mentioned above, international online press conferences or the intensification of social media communication to increase the visibility and reach of VDW topics. Since September VDW regularly publishes podcasts on topics from industry and business. Under the title Tech Affair - Industry for Future which should remember to Fridays for Future, representatives from business and science discuss future topics of industry. And it's all right to be controversial. The first episode dealt with Resilience - ways to a crisis-proof industry, a topic that concerns the entire industry; the second episode will take up the climate-neutral factory.

#### **Energy efficiency of machine tools remains in focus**

In view of the intensive global debate on climate change, the topics of sustainability and energy efficiency are once again moving into focus. Politicians, above all the European Commission, have been trying for years to regulate the energy efficiency of machine tools. The Green Deal by Commission President Ursula von der Leyen will revive the discussion that is currently dormant for our industry.

German manufacturers, who are at the forefront of technical progress, always use the latest technologies to minimise energy consumption. In order to demonstrate this to politicians, the VDW is currently setting up an energy efficiency database that is unique. The aim is to collect information about implemented measures for the energy efficiency of machine tools and to make it transparent. This will enable statements to be made in the future that are not only valid for individual machines/technologies of a manufacturer, but also show the efforts and successes of the entire industry.

#### **Mechanical Engineering Young Talent Foundation focuses on digitisation**

More than ten years ago, the VDW organised the advertising for qualified young industrial workers in a foundation. In 2017, this

became the Nachwuchsstiftung Maschinenbau, which combines the vocational training activities of the former VDW-Nachwuchsstiftung and advertising campaigns for young academics of the Verband Deutscher Maschinen- und Anlagenbau VDMA. The aim is to jointly promote vocational training in mechanical engineering with a view to future requirements for young people.

Actually the biggest task is to integrate requirements of digitisation into vocational training. To this end, the Mechanical Engineering Young Talent Foundation has developed MLS - Mobile Learning in Smart Factories. On the platform, teachers and trainers make their learning offerings available digitally and support them with text, video, web-based training or other formats. As part of a project in North Rhine-Westphalia, NRWgoes.digital, some 300 trainers and 300 vocational school teachers in NRW are to be made fit for digitisation topics over a period of three and a half years. They will then be able to pass on the knowledge they have acquired to their trainees in eight modules, supported by didactically prepared materials. Around 1,400 trainees will benefit from this and will complete the additional qualification Digital Manufacturing Processes. Other German states such as Saxony, Lower Saxony and Hesse are currently interested in similar projects. ■





Alfredo Mariotti  
General Manager  
UCIMU

## "THE MAGIC WORLD OF METALWORKING" at FIERAMILANO RHO from 4 to 9 October 2021

The preparations have already started for EMO MILANO 2021: the Magic World of Metalworking, the world machine tool trade show will take place at the exhibition centre of fieramilano Rho from 4 to 9 October 2021.

After six years and the success of the 2015 edition, the next edition of EMO, alternately hosted in Italy and Germany, comes back to Milan and gets ready to welcome operators from any part of the world.

Promoted by CECIMO, the European Association of Machine Tool Industries, the organisation of EMO MILANO 2021 has been entrusted to the operating structures of UCIMU-SISTEMI PER PRODURRE, the Italian Machine tools, robots and automation system manufacturers' association. With more than ten years of experience derived from the organisation of the six previous editions of the world travelling exhibition, (1979, 1987, 1995, 2003, 2009, 2015) and of BI-MU, the EMO staff will be able to assist visitors, exhibitors, journalists and all the people who will take part in the event, proposing services, initiatives and activities specially dedicated to them.

"The expertise and the experience of our staff - affirmed Luigi Galdabini, General Commissioner of EMO MILANO 2021 - combined with the attractive strenght of Milan, will make EMO MILANO 2021 a truly special and unmissable event. Milan, as a constantly evolving and dynamic city, will be able to offer events to all operators attending the trade show, which will make their visit experience even more interesting".

Undisputed leader in the scenario of the exhibitions regarding the sector, EMO represents the articulated world of metalworking in the best way, combining vision and innovation, as proven by the data of the previous Italian edition (EMO MILANO 2015), hosting 1,600 exhibiting companies, on an exhibit area of 120,000

sq. m. and registering over 155,000 visits of operators coming from 120 countries.

Metal forming and metal cutting machine tools, production systems, enabling technologies, solutions for interconnected and digital factories and additive manufacturing will be among the products and solutions spotlighted at EMO MILANO 2021, which will transform fieramilano Rho into the biggest digital factory ever set up within an exhibition fairground.

For all these reasons EMO MILANO 2021 will offer the opportunity to discover the latest innovations in terms of production technologies and will be a place where to meet, not only to do business, but also to keep up-to-date on the trend that will characterise the factories of the future.

The international connotation of exhibitors will appeal to visitors from all over the world and, despite of the difficulties that have marked the current year, the forecast of the result of the exhibition is positive.

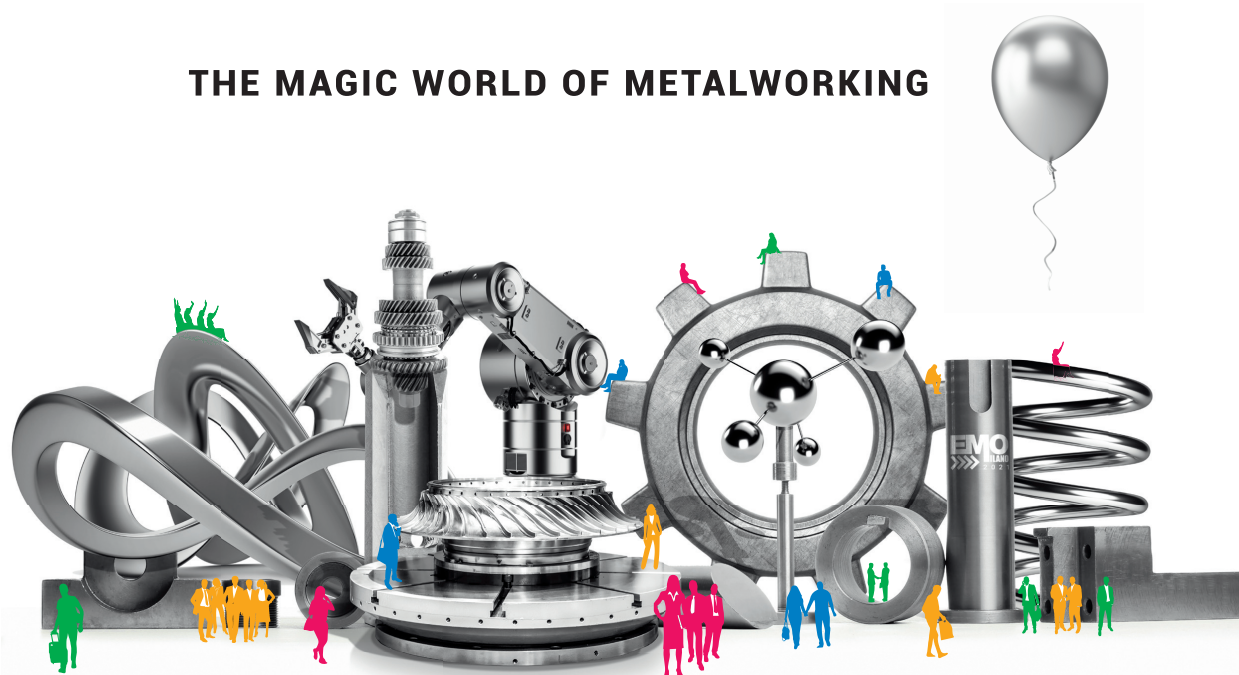
"While setting aside a really difficult 2020 - added Alfredo Mariotti - we are confident that we will achieve excellent results from EMO MILANO 2021, which should benefit from the market recovery, already expected at the beginning of the new year, and from the enterprises' will of relaunch. For its part, the event will work as a demand booster, also thanks to the diversified product offer it will showcase".

CECIMO has already conveyed the calendar of the world travelling exhibitions that will be held after EMO MILANO 2021. After the editions in Germany in 2023 and in 2025, EMO will take place again in Italy in 2027, thus confirming the established time period, in which Milan and Hanover will alternate in the organisation of the world machine tool trade show.

The programme of approaching events and the information concerning participation and details of the exhibition are available on [emo-milano.com](http://emo-milano.com). ■



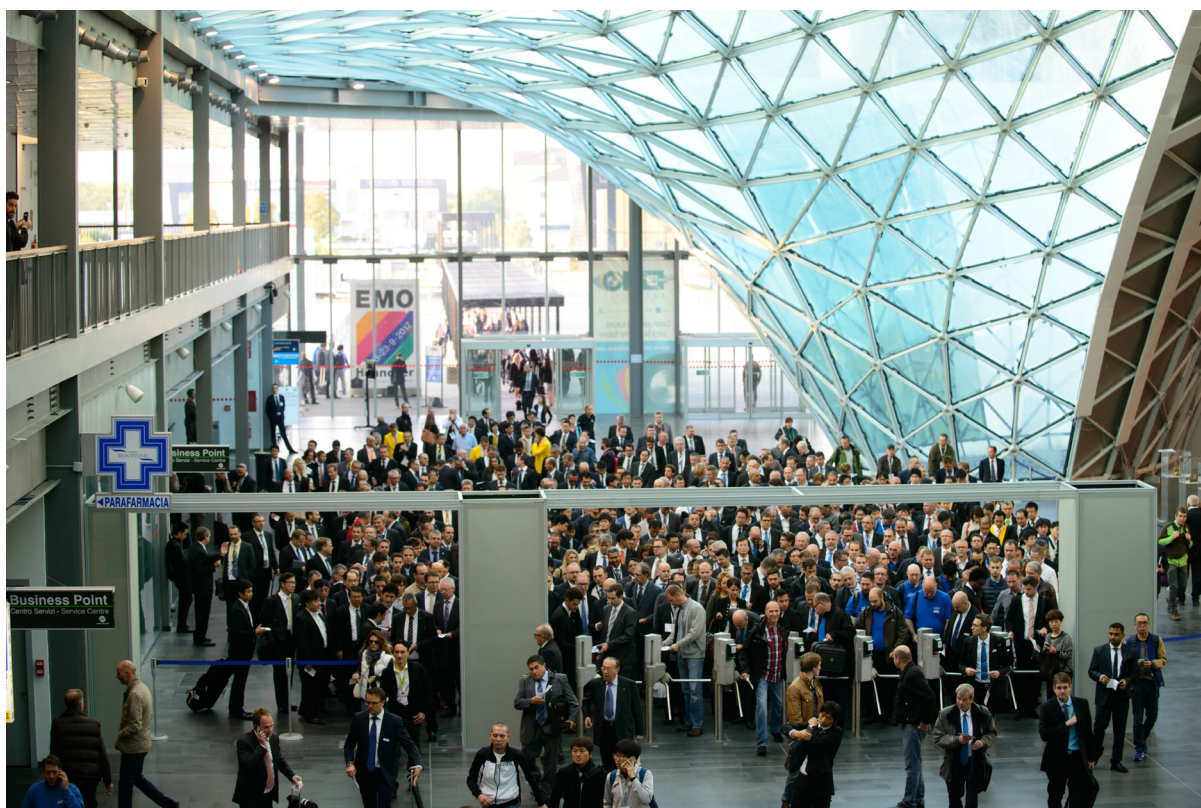
## THE MAGIC WORLD OF METALWORKING



[emo-milan.com](http://emo-milan.com)



Find here all the information to plan  
your participation at EMO MILANO 2021







# ADDITIVE MANUFACTURING EUROPEAN CONFERENCE

2 December 2020  
Online



The sixth edition of the Additive Manufacturing European Conference (AMEC), was held in digital format on 2 December 2020.

Members of the European Parliament, AM industry experts and the moderator, Dr. Fabian Zuleeg, Chief Executive of the European Policy Centre, discussed the advantages of combining digital supply chains and additive manufacturing solutions.

The conference highlighted that the AM sector will play a crucial role in the upcoming review of the European industry strategy. Furthermore, the future market uptake of this technology will help different sectors transition towards the adoption of both digital and sustainable business-to-business services and solutions.

See you next year!



*"AMEC is a great opportunity to foster a deeper dialogue between policymakers and industry about the role that AM plays in supporting the supply chains of the future".*

Stewart Lane,  
Corporate Manager  
RENISHAW PLC and  
Chairman of CECIMO  
Additive Manufacturing  
Committee

## Meet the speakers: Policy session



**FABIAN ZULEEG**  
Chief Executive and  
Chief Economist  
EPC  
MODERATOR



**SUSANA SOLÍS PÉREZ**  
Member of the European  
Parliament  
RENEW EUROPE



**AXEL VOSS**  
Member of the European  
Parliament  
EUROPEAN PEOPLE'S  
PARTY



**MICHAEL BLOSS**  
Member of the European  
Parliament  
GREENS-EUROPEAN  
FREE ALLIANCE



**CHRISTOPHE GRUDLER**  
Member of the European  
Parliament  
RENEW EUROPE

## Industry session



**FABIAN ZULEEG**  
Chief Executive and  
Chief Economist  
EPC  
MODERATOR



**STEWART LANE**  
Corporate Manager,  
Renishaw plc & Chairman  
of Additive Manufacturing  
Committee, CECIMO



**PAUL HEIDEN**  
Senior Vice President  
Product Management  
ULTIMAKER



**ANGELINE GOH**  
Digital Manager  
Supply-Chain & 3D  
Printing Lead  
SHELL



**ROBERTA SAMPERI**  
Head of Global  
Additive Manufacturing  
Planning & Development  
FCA Group



**CRISTIAN FRACASSI**  
CEO  
ISINNOVA



**MARIEL DIAZ**  
CEO  
TRIDITIVE



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### FINNISH DELEGATION



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Advisor, Branch Networks  
Technology Industries of  
Finland

### SWISS DELEGATION



**Alex WASER**  
CEO  
Bystronic Group

### CECIMO SECRETARIAT



**Caterina NISSIM**  
Communications  
Manager

### CECIMO SECRETARIAT



**Frédéric MELCHIOR**  
Director Technical  
Regulation

### CECIMO SECRETARIAT



**Alessandra ZINI**  
EU Public Affairs  
Officer & Projects  
Coordinator

### CECIMO SECRETARIAT



**Ludovica PINCI**  
Office and Events  
Manager

## Save the dates

**CECIMO 2021 Spring General Assembly**  
5-8 June 2021 - Brussels

**CECIMO 2021 Fall General Assembly**  
Dates and Location TBC





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## Member Associations

**Austria: Metaltechnology Austria**  
Die Metalltechnische Industrie  
[www.metalltechnischeindustrie.at/en](http://www.metalltechnischeindustrie.at/en)

**Belgium: AGORIA**  
Fédération van de Technologische  
Industrie  
[www.agoria.be](http://www.agoria.be)

**Czech Republic: SST**  
Svazu Strojírenské Technologie  
[www.sst.cz](http://www.sst.cz)

**Denmark: The Manufacturing Industry**  
a part of the Confederation of Danish  
Industry  
[ff.di.dk](http://ff.di.dk)

**Finland: Technology Industries of  
Finland**  
[www.teknologiateollisuus.fi](http://www.teknologiateollisuus.fi)

**France: SYMOP**  
Syndicat des Entreprises de  
Technologies de Production  
[www.symop.com/fr](http://www.symop.com/fr)

**Germany: VDW**  
Verein Deutscher  
Werkzeugmaschinenfabriken e.V.  
[www.vdw.de](http://www.vdw.de)

**Italy: UCIMU**  
Associazione dei costruttori Italiani  
di macchine utensili robot e  
automazione  
[www.ucimu.it](http://www.ucimu.it)

**Netherlands: FPT-VIMAG**  
Federatie Productie Technologie /  
Sectie VIMAG  
[www.fpt-vimag.nl](http://www.fpt-vimag.nl)

**Portugal: AIMMAP**  
Associação dos Industriais  
Metalúrgicos, Metalomecânicos e  
Afins de Portugal  
[www.aimmap.pt](http://www.aimmap.pt)

**Spain: AFM - Advanced Manufacturing  
Technologies**  
Asociación española de fabricantes  
de máquinas-herramienta, accesorios,  
componentes y herramientas  
[www.afm.es](http://www.afm.es)

**Sweden: SVMF**  
Machine and Tool Association of  
Sweden  
[www.svmf.se](http://www.svmf.se)

**Switzerland: SWISSMEM**  
Die Schweizer Maschinen-, Elektro-  
und Metall-Industrie  
[www.swissmem.ch](http://www.swissmem.ch)

**Turkey: MIB**  
Makina Imalatçileri Birliği  
[www.mib.org.tr](http://www.mib.org.tr)

**United Kingdom: MTA**  
The Manufacturing Technologies  
Association  
[www.mta.org.uk](http://www.mta.org.uk)

# cecimo

is the European Association of the Machine Tool Industries and related Manufacturing Technologies. We bring together 15 national associations of machine tool builders, which represent approximately 1500 industrial enterprises in Europe (EU + EFTA + Turkey), over 80% of which are SMEs. CECIMO covers 98% of the total machine tool production in Europe and about 35% worldwide. It accounts for more than 150,000 employees and a turnover of around 27 billion euros in 2019. More than three quarters of CECIMO production is shipped abroad, whereas half of it is exported outside Europe.

