

# cecimo

magazine

## THE DIGITAL FUTURE OF MANUFACTURING

**Delivering together  
the European Green  
Deal and the Digital  
Decade**

Peter Dröll, DG RTD,  
European Commission

**Europe's updated industrial  
strategy: what's next for a  
greener, more digital and  
more resilient EU industry?**

Kerstin Jorna, DG GROW,  
European Commission

**Let's do this  
Together! Joining  
Forces for Skills!**

Manuela Geleng, DG EMPL,  
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**EMO**

H A N N O V E R

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# EDITORIAL

## DISRUPTION IS DRIVING DIGITAL TRANSFORMATION IN THE MANUFACTURING INDUSTRY

Dear readers,

The manufacturing sector has always been driven by innovation and technological change. Our sector is among the most inventive ones, contributing to research and innovation of emerging technologies that were already transforming manufacturers' operations before the pandemic. The pandemic has reinforced the value of industry 4.0, but it has also exposed the limitations of today's implementations and set a higher bar for success.

CECIMO has been working on the role of new technologies and innovation and their impact on our industry. To respond to current and future industrial challenges, companies must develop future-ready strategies in order to maximise the impact of digitisation, economic growth, sustainable development and to become leaders of tomorrow.

The 15th edition of the CECIMO Magazine is dedicated to the digital future of the manufacturing industry, taking on board topics that are of relevance for production technology. This issue puts the spotlight on different initiatives and policies that will help European industry navigate the twin transitions, strengthen its resilience and remain at the helm of global industrial leadership. In that regard, you can read more about the updated industrial strategy and future steps towards a greener, more digital and more resilient EU industry.

CECIMO's work in the domain of skills has been recognized by the European Commission and in this edition, you can read more about the pact for skills initiative aiming to identify the skills needed in different sectors to ensure we can flourish in a more green and digital society.



To compete and lead globally, research and innovation are key. In that respect, we bring to you the overview of the EU's research and innovation programme, which provides a plethora of opportunities to deliver on the Green Deal and the Digital Decade, as well as updates on EU-funded projects CECIMO is currently involved in.

Lastly, the Magazine will provide you with the recent developments on standardisation, policy areas relevant to our industry and the role of AM in the green transition of the EU manufacturing sector.

CECIMO would like to thank all contributors for their efforts in making this release possible. We hope you will enjoy reading this Magazine and you will find this issue informative and helpful in keeping yourselves up-to-date on the latest news and policy developments in the field of the manufacturing sector.

A handwritten signature in blue ink, which appears to read 'Filip Geerts'. The signature is stylized and written over a white background.

**Filip Geerts,**  
CECIMO Director General

# POLICY AND LEGISLATION

## EUROPE'S UPDATED INDUSTRIAL STRATEGY: WHAT'S NEXT FOR A GREENER, MORE DIGITAL AND MORE RESILIENT EU INDUSTRY?

- By Kerstin Jorna, Director-General, DG for Internal Market, Industry, Entrepreneurship and SMEs, DG GROW, European Commission

Our industry is in the midst of the most profound changes of the past century. We are faced with the two key generational challenges – the need to make our economy greener and more digital; just at a time when the COVID-19 pandemic has severely tested the resilience of our industrial value chains. To address all of these issues, the Commission is putting into place a comprehensive set of policies that will help European industry navigate the twin transitions, strengthen its resilience and remain at the helm of global industrial leadership.

### GREEN AND DIGITAL TRANSITIONS

This Commission has taken the lead on the green and digital transformations of our economy right from the start of its mandate, with the European Green Deal, Digital Compass and most recently the 'Fit-for-55' package adopted in July. To translate these key political objectives into a comprehensive plan for the transformation of our Industry, the Commission also adopted an Updated Industrial Strategy earlier this year that puts the green and digital transitions at the heart of industrial transformation efforts.

While the Industrial Strategy mainly outlines initiatives that are universal to the whole of industry and entrepreneurship, it also takes a closer look at the specific industrial ecosystems, presenting a dedicated analysis of the



Kerstin Jorna



**To ensure the success of the twin transitions, businesses must drive the needed changes and move to new form of sustainable and digital business models.**

specificities, challenges and benefits of a green and digital transitions in each ecosystem. This analysis, presented as the Annual Single Market Report that accompanied the Updated Strategy, is also one of the starting points for further plans on so-called transition pathways, which will support the implementation of the green and digital transitions in each industrial ecosystem, ensuring they remain competitive and resilient. Such pathways will offer a better understanding of the scale, costs, long-term benefits and conditions of the required action to accompany the twin transitions, leading to an actionable plan in favour of sustainable competitiveness.

To ensure the success of the twin transitions, businesses must drive the needed changes and move to new form of sustainable and digital business models. This is why the Commission has pioneered a strong partnership approach in the co-creation of the transition pathways; working together with Member States and relevant industry stakeholders on setting out steps that individual companies and industrial ecosystems need to take to make it successfully through the transition.

The work on transition pathways is advancing at different pace. We have prioritised work in ecosystems that have been highly impacted by the crisis and those where the transition is crucial to remaining competitive. More specifically, we have advanced work in the Tourism and Energy Intensive Industries; while Textiles, Construction, Proximity and Social Economy will follow soon. The topics addressed in the ‘transition pathways’ range from technological trends, capacity building and skills, investments, infrastructures, R&I and prototyping, competitiveness, governance to social actions.

At the same time, the Commission is ensuring that there are sufficient investments available to support this transition. The European Recovery and Resilience Facility makes more than € 720bn in loans and grants available to support reforms and investments undertaken by Member States. The targets include 37% of expenditure for climate investments, and 20% of expenditure to foster the digital transition.



## ENSURING RESILIENCE OF OUR SUPPLY CHAINS

The pandemic has showed us that the health crisis has accelerated the twin transitions of our industry and at the same time highlighted the importance of strengthening the resilience and security of our industrial supply chains.

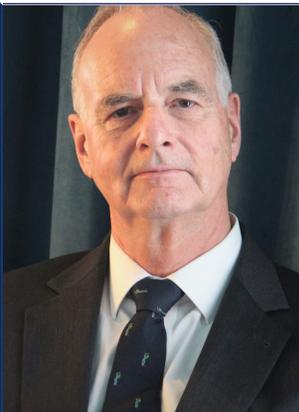
This is particularly crucial when it comes to developing Europe's capacity to produce clean hydrogen, which is an essential driver of our green transition and key to decarbonising industrial processes where this is urgent and difficult to achieve. To ensure Europe's technological leadership in this field, we need to ramp up production capacities in electrolyzers and fuel cells and ensure industrial take up of hydrogen.

The pandemic clearly showed the need to address the EU dependencies, in particular to ensure our access to critical raw materials and decarbonised electricity. The Commission has helped to set up the European Hydrogen Alliance as well as the European Raw Materials Alliance, which are addressing these challenges in view of making Europe a leader in clean hydrogen.

Similarly, Europe and much of the rest of the world face are currently experiencing shortages in the supply of semiconductors or chips, driven by a demand hike for smartphones, Internet of Things and connected cars. In this, Europe depends on state-of-the-art chips manufactured in Asia. Chips are a strategic component of any industrial change and drive the digital transformation. This makes them crucial not only to European competitiveness, but a key issue of technological sovereignty. For this reason, President von der Leyen announced a European Chips Act, which will help to address the current challenges, by linking Europe's world-class research with new design and testing capacities. This would require coordinating EU and national investment along the value chain, to jointly create a state-of-the-art European chip ecosystem, including production. At the same time, this will create new markets for ground-breaking technology, and bring technological sovereignty within reach.

## CONCLUSION

In view the large transformations facing our industry, the EU has chosen to turn the challenges into new opportunities. The measures being put into place aim to ensure that Europe can build a greener, more digital and more resilient EU industry and lead the world by example.



**A cooperative synergy between the EU policymakers and industrialists is of paramount importance to maximise the benefits of digital solutions in order to support both economic recovery and shift towards more sustainable manufacturing.**

- Dr. Hans-Martin Schneeberger, CECIMO President 2019-2021

# THE EU ACTION TO PROVIDE EXPORT OPPORTUNITIES AND TACKLING TRADE BARRIERS TO THE BENEFIT OF MACHINE TOOL SECTOR

- By Denis Redonnet, Deputy Director-General, DG TRADE, European Commission



**When it comes to trade agreements, our collective efforts aim at maximising the benefits of negotiated commitments and minimising distortions caused by barriers or unfair trade practices by EU trading partners, thus ensuring EU companies can compete on a level playing field.**

The European machine tool sector is highly export oriented and relies on an open, sustainable and assertive EU trade policy to promote its competitiveness globally.

As the European Commission's first Chief Trade Enforcement Officer, I am steering since July 2020 the Commission's activities on implementation and enforcement, supported by a new enforcement directorate in DG TRADE. When it comes to trade agreements, our collective efforts aim at maximising the benefits of negotiated commitments and minimising distortions caused by barriers or unfair trade practices by EU trading partners, thus ensuring EU companies can compete on a level playing field.

This is vital in particular for small and medium-sized enterprises (SMEs), which represent 80% of CECIMO's membership. The Commission's [Annual Report on Implementation and Enforcement](#) provides a detailed overview of the main actions and results in 2020 and the first half of 2021. I will just highlight a few, which strike me as being of particular interest to the machine tool sector.

First, when it comes to eliminating trade barriers, notwithstanding protectionist tendencies exacerbated by the Covid 19 pandemic, good results were achieved in 2020: We removed 33 barriers in 22 countries and EU companies gained an additional €5.4 billion in exports per year, thanks to the barriers removed over the preceding 5 years (2014-2019).



Denis Redonnet

In particular, non-tariff and technical barriers to trade (TBTs) add considerable burden to exporters in the machine tool industry. They constitute the second largest category of trade barriers recorded by the Commission at the end of 2020 (17%) and are complex to tackle as they occur behind the border. We succeeded in eliminating 6 TBTs in 2020. More broadly, according to recent estimates, work at the WTO on removing, averting or clarifying TBTs benefited around €83 billion worth of EU exports over the past decade in a wide range of sectors, including the machine tool sector.

CECIMO members will also be satisfied that, following intense engagement, the US agreed in October to no longer apply Section 232 tariffs on a certain amount of EU exports of steel and aluminium starting 1 January 2022.

The newly created Trade and Technology Council offers a platform for cooperation between the EU and the US in areas highly relevant for the machine tool sector, such as emerging technology standards or secure supply chains.

The latest change in how we tackle trade barriers was the launch by the Commission in November 2020 of the [Single Entry Point](#), a dedicated complaints office, so that EU companies and stakeholders can lodge complaints on breaches by trading partners of commitments under EU Trade agreements, be they related to market access or infringements of trade and sustainable development provisions or the EU Generalised Scheme of Preferences (GSP). Through the team in the SEP, stakeholders receive guidance on how to lodge a complaint and keeping them informed on the follow-up.

Second, the Commission has also been upgrading communication and interaction with stakeholders, in particular SMEs, to help them take up the benefits of trade agreements.

In the center of these efforts is our new platform “Access2Markets” (A2M), launched in October 2020, a free to use one-stop-shop where CECIMO members will find multilingual and user-friendly information on exports, duties, taxes, customs procedures, product rules and requirements for 122 export markets and 190 source markets.

A2M is designed with the specific needs of SMEs in mind, like those represented by CECIMO, supporting their internationalization.

Trade agreements can be an important asset to help them tapping into global markets. Available in 24 languages, A2M has around 10,000 visitors per day and over 1.5 million visitors in just a year.

Users can find detailed information on rules of origin and assess if their product qualifies for the tariff preferences that trade agreements offer thanks to the interactive Rules of Origin Self-Assessment tool (ROSA): You just need to go to the on the European Commission's Access2Markets portal, enter the product code (which the search tool ‘MyTradeAssistant’ will help you establish), as well as the country of origin and the final export destination, after which you will be guided through the interactive self-assessment by answering a number of questions. This tool helps exporters and their suppliers to assess the origin of their product before the latter issue a supplier's declaration.

The latest addition to A2M is the “[Access2Procurement](#)” tool launched in September 2021 for the EU-Canada trade agreement (CETA): After answering three quick questions on procuring entity, subject matter of the procurement and the expected value of the contract, CECIMO members interested in a public tender published by the Canadian authorities at central or sub-central level can now find out whether they are entitled to bid. The tool will soon be extended to cover other EU trading partner countries.

Ultimately, the success and impact of Commission initiatives such as the ones introduced above will depend on organisations like CECIMO helping us locate (potential) trade barriers and spreading the word about EU trade agreements to (potential) beneficiaries, whether inside the EU or abroad.



**Fair and open trade is an approach that enhances overall prosperity, gives us access to valuable economic resources, fosters business growth and provides greater value to our customers.**

– Carl Martin Welcker, President and CEO, Alfred H. Schütte GmbH & Co. KG

# INTERVIEW WITH GIAN MARIO MAGGIO - EIT MANUFACTURING CLC SOUTH MANAGING DIRECTOR

EIT Manufacturing is an Innovation Community supported by the EIT (European Institute of Innovation and Technology) that connects the leading manufacturing actors in Europe. EIT Manufacturing brings together more than 65 European leading partners from business, education, and research, from 17 different countries.

As part of its strategy, EIT Manufacturing has defined four innovation areas, called “flagships”, one of which is entitled Digital and Collaborative Solutions for Innovative Manufacturing Ecosystems and it is addressing exactly the topic of Digitisation of Manufacturing, in line with our discussion today.

**Over the past decades, the manufacturing sector has faced changes on multiple fronts. What is the Future of manufacturing and how does industry 4.0 change manufacturing?**

We have been using computer-controlled machines in manufacturing for several decades. However, the existing and future trends are pointing to the shift of manufacturing activities to the cyberspace, like design and integration of components, monitoring of performance in the cloud.

This is the result of the so-called Digital Transformation which goes beyond the digitisation of existing processes, it rather requires a clean-slate approach to re-think the organization of the factory of the future. In fact, I expect that the new wave of manufacturing evolution will result in radical changes not only of the operational processes in manufacturing, but also of the human aspects, as well as sustainability.

We are moving towards a new paradigm of Smart Products, also thanks to the advances of the semiconductor industry and despite the current chipsets shortage, with increasing edge networking and computing capabilities, that are enabling a local intelligence, powered by AI.



Gian Mario Maggio

This is an important aspect of the Industry 4.0 model where data derived from the product usage are analysed to improve future versions, but also to ensure proactive maintenance and fine tuning. This leverage on the cyberspace to deliver functionality, coupled with the increasing softwarisation of products is making possible to increase over time the functionality of the final product.

This has strong implications on the manufacturing infrastructures interacting with the supply and distribution chain, as well as with retail points and eventually the customers and users.

The Industry 4.0 paradigm requires an underlying capacity of collecting, sharing, processing data in a secure manner across the entire production value chain. This is exactly in line with the new GAIA-X initiative, of which EIT Manufacturing is a member, it aims to promote the development of manufacturing data spaces and the corresponding digital platforms handling the data.

Value networks for digitalised manufacturing companies need a strong base of digital platforms to enable an efficient digital marketplace. Platforms and integrator companies are key enablers to European manufacturing innovation. For instance, a strong digital backbone is key to capitalise on the potential of AI for SMEs. However, it is also important that Europe takes a leading position in the development of digital platforms for industrial data space – unlike what happened for the personal data space (e.g. Facebook).

On the consumer side, we see demand for hyper customized goods which is linked to highly flexible production. Namely, the customer will be connected to the factory and influence the factory processes. The idea is to merge customisation with mass production, on one end maximising the perceived value and on the other hand the advantage of scale, minimising the cost.

### **What are the main challenges that the manufacturing industry is facing when adopting key enabling technologies (e.g. AI, 5G, additive manufacturing) and how can the EU support the technologies uptake in the industrial sector?**

I will mention two examples of challenges that the manufacturing industry is facing when adopting key enabling technologies, one technological and the other non:

- The acceleration of the industry digitisation, with Industry 4.0 and the advent of Industrial IoT (Internet of Things) are leading to an increased surface of attacks in the cyberspace.

Likewise, operational activities rely on solutions provided by a large range of providers and integrated through hybrid on-premises/cloud architectures, adding to the difficulty ensuring their end-to-end cybersecurity. Consequently, manufacturers are facing rising cybersecurity threats targeting facilities requiring large investments and where the impact's severity can reach critical levels due to safety and environmental risks.

- The manufacturing industry is characterised by mass production and very low margins; therefore this may represent a limit when requiring significant investments for new technologies. Companies are typically motivated to invest for cost/energy savings – rather than for sustainability purposes. Digital Transformation may fail because of lack of acceptance or lack of the right skills to use and capitalize on the new technology. This is where EIT Manufacturing could come into play in terms up upskilling and re-skilling – not only for the blue collars but also for the white collars.

### **What new business models could be developed through the use of emerging technologies?**

Industry 4.0 is favouring the “servitisation” of products, increasingly more with the Digital Transformation products which are likely to be offered integrated in services. Let's take the example of Tesla electric vehicles. Tesla as a car manufacturer is selling more than with its product, in terms of additional services leveraging on data. For example, with the continuous improvement of products through data analytics from the all products sold, and development of services flanking the product, like for instance new auto-pilot functions.

Moreover, new “XAAS” business models are emerging, where what is offered as a service is “X” could be software, mobility, production or else.

For example, new and improved Additive Manufacturing processes are technology enablers not only to speed up the development process but are also increasingly considered for mass production of highly performing and complex parts with innovative and unique design features.

The transition to servitisation is aligned with the fundamental pillars of Circular Economy: the transition from ownership (for example, a car) to access to the service (the need of moving from A to B). In that sense, servitisation provides a more efficient and effective use of resources.

### **How can we foster SMEs' adoption of digital solutions?**

EIT Manufacturing has recently ran a survey involving more than 80 companies, providing somewhat counterintuitive, but logical results.

There are structural effects that affect the digital transformation of companies and their working processes. Larger companies have more formalised working processes, organising their digital transformation with a dedicated IT department and trying to rationalise their production process with the use of IT. Smaller companies tend to use digital technologies to rationalise their design processes, and these technologies have a greater impact on the human relations pertaining to these processes (communication, managerial methods, etc.).

Generally speaking, it is fundamental for an SME to first think about their business and then adopt a digital solution.



**Adopting digital technologies should not be for the sake of it, but only to enable the business growth. The adoption of digital technologies is not a short-term action, but a strategic shift aligned with a long view on how digitalisation could support the business' growth.**

In EIT Manufacturing we have a clear mandate to support SMEs in their transition towards Industry 4.0 and we have specific tools enabling such a transformation process: for example, in 2021 our Business Creation Pillar has launched the “SME Transform Call” aimed at assisting Small and Medium Enterprises in identifying the technology that better fits their needs; and at financially supporting the technology integration process while offering, at the same time, project management expertise.



## **Achieving more sustainable manufacturing can be considered one of the goals set by the EU in its Green Deal. How can EIT Manufacturing support the EU manufacturing sector in that transition?**

The impact of human activities on the environment has been strongly rising during the past century. As our societies become increasingly aware of the harmful effects of our economy, production and consumption systems, we face a major challenge: changing them to reduce our impact on natural areas and habitats and limiting the effect of global warming that could cause major damages both to the environment and the economy, to which all businesses may not survive.

It is therefore in the industry's best interest to start now to change its operation, production and business models to anticipate and limit the changes to come. Strong efforts must be done, and producers need a global efficient strategy to succeed.

EIT Manufacturing wants to promote another way of producing and consuming, by changing our relationship to what is currently considered as waste, relying on several general principles. One of them is to turn waste into by-products, using three processes: reuse, recycle and recovery.

The aim is to provide a new purpose to what was once waste. The benefits of such practices are twofold: a reduction of the amount of waste that eventually ends up in landfills, as well as raw material global consumption, thus preserving natural stocks.

The way companies work also needs to be modified, regarding their relationships with partners and customers. Therefore, strong collaborations and synergies must be developed to enable these multiple interactions. Moreover, the sales contracts binding customers, producers and retailers have to evolve accordingly to the functional economy paradigm. In the functional economy, only the products' use is sold. This way, the products end-of-life is entirely taken care of by the producers, allowing them to retain much more value that would be lost otherwise, and to propose updatable and longer lifetime goods that enhance customer loyalty.

In addition, this ambitious transition from linear to circular will be supported by the emergence of new technologies and the advent of the Industry 4.0. The fourth industrial revolution is characterized by the widespread use of digital and connected technologies. This set of assets allows for optimized consumption of resources, enhanced productivity, better tracking of the products during production and use phase and improved collection, sorting and recycling at the end-of-life phase.



**Given their critical position as the starting point of almost every manufacturing activity, machine tools are a key enabling technology that can have a direct impact on the productivity and competitiveness of European manufacturing and thus lead the transition towards a circular economy .**

– Mikko Nyman, CEO Fastems OY AB

# ARTIFICIAL INTELLIGENCE ACT: TOWARDS A NEW EUROPEAN MODEL TO FOSTER INNOVATION AND CREATE SAFEGUARDS

- by Brando Benifei, Member of the European Parliament

Thanks to the repeated requests by the European Parliament, voicing the concerns of industry stakeholders, the European Commission finally launched its updated industrial strategy last May, mainly with the purpose of handling the disruptions to the supply chains, to industries and to SMEs brought about by the pandemic at global level.

During these long and difficult months, much has changed. Both businesses and citizens, likewise public administrations and public and private services had to cope with a sudden and radical shift towards an online and remote economy and indeed digitalisation has risen as a key drive for Europe's industrial as well as general economic recovery.

Against this background, businesses and workers in the EU have shown resilience and ingenuity at their best. However, far-reaching European policies are essential to accompany this transition by adapting the previous modes of production to this ongoing technological revolution.

I have the honour of being appointed the European Parliament's rapporteur on the new Artificial Intelligence Act, a legislative dossier that is going to play a critical role in this process.

European lawmakers have today the unique opportunity to lead on the global scale in establishing an ambitious model for digital rights and for an AI that is human-centric and trustworthy, but also that is capable of fostering innovation and providing for a much needed level of harmonisation and development of new standards in the EU digital (and analogic) market.



The machine tool and the manufacturing technologies industries find themselves in the middle of these two worlds, the digital and the physical one. Fine-tuning and synchronising the legislative work on the AI regulation, which is about to kick off, and on the Machinery Regulation for example, is therefore not only a priority but an absolute necessity.



As the outcomes of these ongoing negotiations in the EU institutions and the Member States will inevitably have a dramatic impact on citizens and businesses in our continent, the full involvement of every relevant stakeholder, such as CECIMO, at all stages of the discussions cannot be stressed enough.

There is certainly the need to improve the text of the Machinery Regulation in such a way that a clear regulatory framework is put in place, while maintaining its ambition to ensure the highest standards of safety but also permitting the possibility for European industries and manufacturers to compete globally.

CECIMO has adopted a very interesting position paper that highlights a number of critical aspects of the proposed text while also highlighting its several merits.

What we should be seeking for is a proper balance between market aspects, technological and technical specificities as well as broader regulatory considerations, such as cybersecurity, health and safety at the workplace or sustainability.

As rapporteur of the Artificial Intelligence Act I am ready to facilitate dialogue and the exchange of knowledge between industries, citizens, consumers and administrations.

I am planning to deliver my first draft in early 2022 in order to have a strong Parliament negotiating mandate in the summer. I am looking forward to collaborate with CECIMO and your members to ensure that we design a good compromise between necessary safeguards and the freedom to innovate and to compete.



**We are experiencing a historical moment where the relation between innovation and policy is essential to allow industries to implement new digital solutions. To create a competitive European industry environment, requirements from legislators must give us enough space to operate without limiting innovation.**

– Francois Duval, Managing Director, GF Machining Solutions

# DELIVERING TOGETHER THE EUROPEAN GREEN DEAL AND THE DIGITAL DECADE

- by Peter Dröll, Director for Prosperity, DG Research and Innovation, European Commission

EU companies are global champions of manufacturing. With the European Green Deal, the EU is the global champion of the sustainability transition, including the digital transition under the EU's Digital Decade strategy.

The COVID-19 crisis has re-enforced our ambition and policies for this twin transition. Not only has it demonstrated the essentiality of upholding free movement of persons, goods, services and capital in the Single Market, it has also showed that the business case for green and digital transition is stronger than ever. In the medium-term, all business activity has to become sustainable. The impact of the climate crisis is getting more visible and serious every day and citizens, especially the younger generations, are rightly demanding a bold change. The transition towards a circular economy requires new business culture that puts societal goals at the centre. The manufacturing enterprise of the 21st century will need to be regenerative, giving back to nature more than it has taken from it to produce goods and services. It also has to be human centric, recognising the ingenuity of workers and empowering them with dedicated training and professional development to help shape the future of the company.

Under the European industrial strategy of May 2021, we co-create transition pathways across relevant industrial ecosystems. Such pathways will offer a better understanding of the scale, cost and long-term benefits of the required actions to accompany the twin transition for the most relevant ecosystems. This will in turn lead to an actionable plan in favour of sustainable competitiveness. Industrial technology roadmaps developed under the European Research Area will contribute to these pathways and accelerate technology adoption in relevant sectors across the EU. The industrial strategy presents actions to reduce Europe's strategic dependence, both in technological and industrial sense.



Peter Dröll

We have identified such dependence for some 130 products, which represent 6% of the EU's total import, relevant for energy intensive industries (raw materials) and health (active pharmaceutical ingredients). To put our "open strategic autonomy" in practice, we will periodically review such strategic dependence and explore international partnerships and cooperation, launch industrial alliances and provide guidance on addressing strategic dependence through public procurement.

It is a huge challenge to achieve our transition targets. To succeed, research and innovation are key. Horizon Europe, the EU's research and innovation programme, provides a plethora of opportunities to deliver on the Green Deal and the Digital Decade. Out of a budget of €11 billion for funding collaborative projects in 2021 and 2022, €5.9 billion will support the green and €4.1 billion the digital transition.

A good share of these investments form a part of long-term research and innovation investments under European Partnerships with industry and Member States. They are dedicated to the development of key technologies such as big data, artificial intelligence and robotics, new electronic components and software, high performance computing and the next generation internet (6G). One of these partnerships – “Made in Europe” – is dedicated specifically to manufacturing, reflecting the key role of the manufacturing industry in enabling the twin green and digital transitions.

Two new instruments under Horizon Europe offer additional opportunities, which are highly relevant for the manufacturing industry. Firstly the EU missions. With the mandate to deliver concrete solutions by 2030 to some of our greatest challenges, they support Commission priorities such as the European Green Deal, Europe fit for the Digital Age, Beating Cancer and the New European Bauhaus. Secondly, the European Innovation Council (EIC). With a budget of €10 billion, the EIC funds innovative projects through grants and direct equity investments accelerating the twin transition. In addition to financial support, it also provides business support services to help companies in its portfolio to scale up and connect with investors, corporates and public authorities.

The success of these investments relies on a skilled labour force. For instance, more than 90% of professional roles require a basic level of digital knowledge, just as they require basic literacy and numeracy skills. Yet, around 42% of Europeans lack basic digital skills, including 37% of those in the workforce. To meet our target – increase the share of adults having basic digital skills to 70% by 2025 – we have developed a range of policies and initiatives, ranging from high-tech partnerships for digital skills to the Digital Skills and Jobs Platform and from the Digital Skills One-Stop-Shop to the European Digital Skills and Jobs Coalition.

We are also working on an initiative to support and empower universities towards their future challenges. This will include, among other things, actions to support digital and green skills.



# LET'S DO THIS TOGETHER! JOINING FORCES FOR SKILLS

-by Manuela Geleng, Director for Jobs and Skills, DG for Employment, Social Affairs & Inclusion, European Commission

The right skills are essential for people to thrive, for our economy to grow, and for a successful recovery. The Pact for Skills was set up a year ago to bring together employers, trade unions, public employment services, national, regional and local authorities and other stakeholders to identify the skills needed in different sectors of the economy to ensure we can flourish in a more green and digital society.

The Pact celebrated its first birthday on 10th November 2021. A lot has happened in the last year. The strong alliances already built are creating opportunities for working-age people across Europe to learn new skills and improve their prospects in the labour market and at work.

One year on, the Pact for Skills is delivering: 450 organisations have pledged to create a culture of learning in their workplaces and support 1.5 million people with training to increase and expand their skills. CECIMO is one of those partners, active in sector-wide partnerships. Your engagement is helping to move the dial on upskilling in Europe. Going forward, our ambition is to expand the Pact and support its members to connect with like-minded organisations, get inspired, connect with funding where needed – and of course, get training.

Everyone joining the Pact commits to principles under a charter to build quality and inclusive skills initiatives.

They also set out for their partnership or organisation concrete targets on what they want to do to increase skills, for instance a commitment to:

- train people in their sector
- invest in up and reskilling
- develop new training programmes
- promote the value of learning in their organisation and with their partners.

Following high level round tables with movers and shakers in the 14 'industrial ecosystems' identified by the EU Industry Strategy, large-scale partnerships are starting to emerge.



Manuela Geleng

The first five partnerships in automotive, microelectronics, aerospace & defence, offshore renewable energy and shipbuilding and maritime technology – have announced commitments, pledging to up- and reskill over 1.5 million people in Europe. They are also working on ways to attract new workers to their industry and gathering intelligence on future skills needs in co-operation with EU social partners. We are also joining forces with regional stakeholders and bringing regional actors together to achieve the goals set by the Pact. This is only the first year of the Pact and we aim for growing progress as the Pact develops and activities gain further momentum.

To build a skilled workforce and inclusive society we need ambitious targets. The European Pillar of Social Rights' Action Plan sets out that by 2030, 60% of all adults should participate in training every year. This was welcomed by EU Leaders, including social partners and civil society, at the Porto Social Summit in May and by the European Council on 25 June 2021.

In order to support Member States in reaching these objectives, the Commission will put forward ambitious initiatives. To empower all adults to keep on learning throughout their careers and to make sure everyone has the opportunity to succeed, even while faced with the changing labour markets and the digital and green transition, the Commission is now preparing an initiative on Individual Learning Accounts. It will be accompanied by an initiative on micro-credentials. Indeed, the way in which people learn is changing. Short courses can facilitate flexible learning pathways and micro-credentials can help ensure that the outcomes of these courses are understood and recognised. The Commission will put forward a European approach on micro-credentials in order to support their quality and foster trust among employers and learners.

COVID 19 has accelerated the digital transition, making telework and distance learning a sudden reality for millions of workers. However, it also highlighted the limitations of current preparedness – many workers lack strong digital skills and workplaces are often under-prepared for this way of working. While more than 90% of jobs now require digital skills, according to the 2020 edition of the Commission’s digital economy and society index, in 2019, 42% of the EU population still had an insufficient level of digital skills. We are far from the EU target to reach 80% of adults with basic digital skills. This is one of the challenges that the Strategic Dialogue on digital education and skills announced by President Von der Leyen in her State of the Union will aim to tackle.



Skills policies and actions are shared between many players. Companies, including SMEs, social partners, education and training providers, national, regional and local authorities, chambers of commerce and employment services, are among the ones who contribute to making up- and reskilling a reality.

The Commission is counting on the involvement of industrial partners such as CECIMO to come together and join forces in its skills initiatives. Let’s join forces and do this together!



**The speed of technological development is ever-increasing, and every skill will eventually become outdated if not maintained. Hence, the EU must foster coherent and coordinated lifelong learning opportunities to enable economic growth and maintain European industries’ competitiveness.**

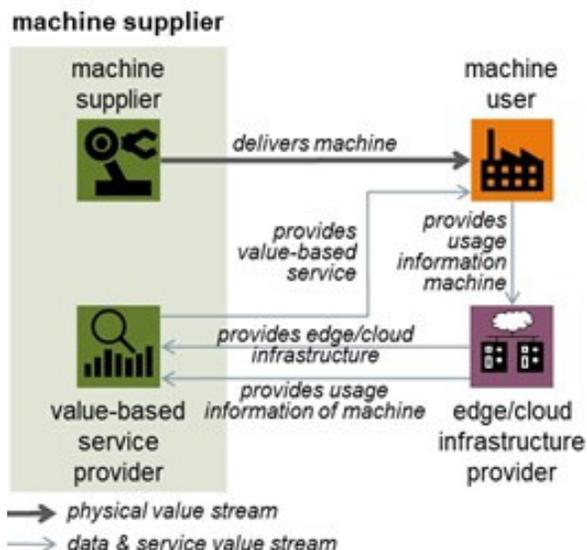
– Matts Spångberg, General Secretary, SVMF

# DATA-DRIVEN MANUFACTURING FOR A SUSTAINABLE EUROPE

- by Thomas Hahn, Chief Expert Software, Siemens AG/ Vice-President, Gaia-X aisbl

Digitalization in the manufacturing industry enables internal value-creation processes like design and engineering, production including the supply chain, and service processes to be optimized. This means that it contributes to sustainability from the operational and technical perspectives. And digitalization is also the basis for new business opportunities for manufacturing companies and thus contributes to sustainability from an economic direction.

The following value-added network illustrates this: A machine supplier equips a machine with additional functionalities, including remote capabilities and the ability to predict its health status. The user of the machine can now optimize its use: for example, reacting proactively to an imminent breakdown or involving experts to remotely optimize the machine. However, for the machine manufacturer to implement these additional capabilities, a powerful edge/cloud infrastructure is required. With an edge infrastructure, the machine supplier can ensure the machine's data sovereignty. The cloud is required to secure the machine's connectivity and to engage dedicated computing capacities for functions like machine learning.



The figure shows that on this operational and technical basis, the machine supplier can monetize the additional functionalities and expand their business model with value-based services.

## EXAMPLE: PREDICTIVE MANUFACTURING FOR A SUCTION GRIPPER



A German OEM uses both edge and cloud computing to realize predictive maintenance for its vacuum systems for material handling. The company is highly innovative, and it was facing two major challenges:

- Suction gripper wear was causing energy to be wasted, and in the worst case, machine defects and loss of availability.
- The company needed to be able to predict the next service interval in order to optimize the machine and increase customer satisfaction with its new business as an OEM.

They are using a layered and scalable edge and cloud infrastructure to process, analyze, and store their data to address these challenges.

IO devices are connected to a programmable logic controller (PLC) to control the process and perform basic data processing. After aggregating, analyzing, and storing the data locally, the results are either displayed directly at the machine, or they can be accessed company-wide on a tablet.

Connectivity to the cloud enables the visualization of the data, either by the machine user or globally. The data are used to conduct remote support and offer services to customers by analyzing data historically or on the fly. This software solution allows the manufacturer to prevent unplanned downtime, reduce energy consumption and better plan maintenance.

## CONCLUSIONS

A number of initiatives and activities have already been launched to introduce and tap the potential described above on a broad scale. Without claiming to be exhaustive, these issues and activities include:

- Discussing the impact of overarching trends. One example is the topic of a platform economy discussed, for example, in an expert working group moderated by the VDMA.
- Exchanging of ideas about new business models enabled by digitalization. Examples include providing methods and exchanging best practices: –for instance, by the “Digital Business Models” working group from the Platform Industrie 4.0.
- Providing and developing data analyses and methods of implementing artificial intelligence as enabling technologies. In this context, the Big Data Value Association should be mentioned: It is developing an innovation ecosystem that will enable the data- and AI-driven digital transformation in Europe.
- Developing trust in the data exchanges involved in a cross-company supply relationship. This includes the technical concepts and architectures that have been discussed and developed for GAIA-X and IDSA.
- Targeted development of international standardization in the area of smart manufacturing. In particular, the working groups IEC TC65 WG23 “Smart Manufacturing Framework and System Architecture” and IEC TC65 WG24 “Asset Administration Shell for Industrial Applications” should be noted in this context.



Thomas Hahn



**With the help of various financial instruments, the EU should encourage innovative business opportunities for SMEs and strategic industries. This will increase the EU's leadership in advanced manufacturing technology and boost the competitiveness and growth of Europe.**

– Robert Nefkens, Managing Director, Hembrug B.V.

# ADDITIVE AND SUBTRACTIVE TECHNOLOGIES TOGETHER FOR INNOVATIVE PRODUCTS

- by Eleonora Atzeni, Associate Professor, Politecnico di Torino

Additive manufacturing (AM) is recognized as an enabling technology of Industry 4.0. It is a flexible and sustainable technology, capable of responding to the challenges faced by mass customization. Additive manufacturing realizes the digital production: the components are produced directly by processing their three-dimensional CAD data, having as the only prerequisite the availability of the virtual model. There are many benefits offered by AM, one of the most relevant being the high design freedom. The high degree of realizable geometrical complexity makes it possible to optimize materials and shapes for component functionality or to consolidate multiple parts into one with combined properties. The interest increases when AM of metal parts is considered, having a huge impact the added value provided by additive manufacturing.

Although the advantages of AM are remarkable, some open issues still remain, and one is the characteristic poor surface quality of AM components. It rarely happens that an as-built part can be used as is and does not require further finishing processes. As regards metal AM techniques, the laser-based powder bed processes allow near-net-shape parts to be created. Parts fabricated by electron beam-based processes usually require finishing treatments. On the other hand, the direct deposition process almost always involves a subsequent mechanical reworking of all the surfaces.

In general, the same finishing techniques that are used on traditional components can be applied on additive components. Parts can be sandblasted or shot-peened, with manual or automatic systems, although these techniques do not ensure a uniform and equally precise finishing on all the surfaces.

Massive finishing systems, such as vibratory finishing, combine high productivity and low costs but are unlikely to finish internal surfaces or channels.

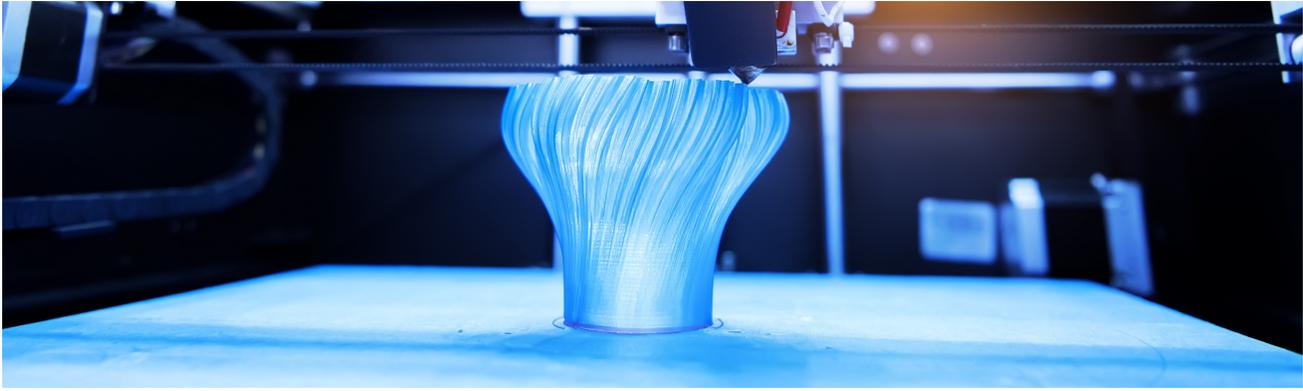


Eleonora Atzeni

An alternative is the use of chemical processes, by which both external and internal surfaces can be finished, but this solution is more expensive, less productive, and causes safety hazards due to the presence of chemical agents. The more productive electrochemical systems have limitations related to the use of an electrode; laser ablation processes are still at the beginning. Isotropic superfinishing, which combines abrasive and chemical methods is a very promising solution to finish components and at the same time impart surface properties such as corrosion resistance.

The processes listed so far improve the aesthetic appearance or the tribological properties of the surfaces, but if dimensional accuracy is the objective, traditional mechanical processing is the solution. In general, the same aspects that represent an advantage for additive components become a challenge when it comes to working on machine tools.

The complex additive geometries are difficult to refer to and hold in the machine, and the tool may have difficult access to them.



Part design optimized for operating load conditions may also have inadequate stiffness when subjected to cutting forces, with the risk of vibrations occurring during machining. Many advantages derive from combining additive and subtractive technologies, geometric freedom, and precision, but it is evident that it is essential to consider the needs of machining from the early stages of component design.

Therefore, structural stiffeners can be added to the design, which could be integrated in the final design, or could be sacrificial structure preforms.

At the forefront of innovation, new hybrid systems are available that combine additive and subtractive processing in the same machine. These are essentially 5-axes CNC machines equipped with both a deposition head, to produce components by directed deposition technology, and a spindle for milling operations. These systems offer superior advantages over sequential machining, as they make it possible to machine internal geometries even

during the building phase, alternating the addition of material and mechanical finishing. So, positioning errors are eliminated, and the quality of the final component is improved.

Applications are in the repairing of worn components or in the production of multi-material components, where local properties are obtained by graduating the chemical composition (i.e. greater wear resistance or conductivity). There are certainly some aspects that impose further technical developments, such as the programming of machining paths with collisions detection on added geometries, or the evaluation of the efficiency in the use of the material during the additive process (the recycle of unused powder could be compromised by the use of coolants in machining). However, it can be stated that hybrid production, even if we are only at the beginning in exploiting its potential, appears to be a very promising innovation.



**Additive manufacturing can help the EU achieve its Circular Economy goals. The sector can play a significant role in developing sustainable products, eliminating waste and scrap, and decreasing material use.**

– Stewart Lane, Corporate Manager, Renishaw PLC & Chairman of the Additive Manufacturing Committee, CECIMO



## **ADDITIVE AND SUBSTRUCTIVE TECHNOLOGIES TOGETHER FOR INNOVATIVE PRODUCTS**

– by Marie Langer, CEO of EOS GmbH

Progressing climate change and the COVID-19 pandemic have permanently changed the way we look at manufacturing and global supply chains. The need for a sustainable, flexible, digital industry transformation becomes increasingly pressing. In this regard, additive manufacturing has the potential to facilitate climate protection in the manufacturing industry and make our economies more resilient. A technology “Made in Europe”.

Time is of the essence. The European Green Deal defines two major goals to overcome the challenges of climate change and environmental degradation: By 2050, the European Union aims to be the first climate-neutral association of states. Moreover, economic growth shall be decoupled from resource use. To achieve these goals, the industry needs to find new and innovative ways of manufacturing and rethink established strategies. One necessary technology for a successful green transition is additive manufacturing.

Additive manufacturing has numerous advantages compared to conventional manufacturing. Regarding the reduction of greenhouse gas emissions, the following applies:

Regarding the reduction of greenhouse gas emissions, the following applies:

- International supply chains based on Just-In-Time deliveries are responsible for a high traffic volume over long distances. Additive manufacturing helps companies to produce parts in-house and on-demand. It makes production more resilient to increasingly frequent external shocks like interrupted supply chains, as we have seen for example during the COVID-19 pandemic.
- Additive manufacturing allows for completely new ways of designing products and parts. For example, the aerospace industry uses industrial 3D printing to produce lighter and more aerodynamic components. This can significantly reduce fuel consumption as well as CO<sub>2</sub> and NO<sub>x</sub> emissions.
- Additionally, modern industrial 3D printing systems use significantly less material compared to other methods like e.g., milling. They can also use innovative materials like bio-based polymers and enable optimized purpose-driven product designs that can only be produced using additive manufacturing.

We at EOS are convinced that the future of production should be shaped by what we call “Responsible Manufacturing”, which we intend to establish as the “new normal”. We are putting our long-standing and pioneering technology expertise at the service of leading the world into responsible manufacturing with industrial 3D printing and supporting our customers in achieving their own sustainability targets.

With the introduction of ESG criteria, it has become increasingly important to demonstrate the climate protection contribution of a technology using measurable figures, data, and facts. Only claiming that a technology is “green” is not sufficient anymore. That is why we decided to cooperate with renowned research institutes to measure the greenhouse gas reduction effect of a specific additive manufacturing application. The results of this study are remarkable.

Together with YOU MAWO, a pioneer company for custom made 3D printed glasses, and Fraunhofer EMI, we compared the environmental impact of additively and conventionally manufactured eyewear.

The study concluded that 3D printed eyewear performs significantly better than the conventional eyewear in all 18 impact categories, such as climate change, human toxicity, ozone depletion, and water depletion. As an example, the carbon footprint of a customized, 3D printed YOU MAWO eyewear product is around 58 percent lower compared to conventionally manufactured eyewear. While even allowing customers to design a completely unique pair of glasses according to their own design aspirations.

<sup>1</sup>“Comparison of the environmental impact of additively and conventionally manufactured eyewear frames”



This is indeed the future of eyewear production and only one example for the immense potential that additive manufacturing has.

What does this imply for the overall industrial strategy of the European Union? First, it demonstrates that we need additive manufacturing to achieve our climate goals. Considering the challenging task that we are facing, we must make use of all sustainable technologies at hand. The good news is that additive manufacturing is no “rocket science”. With the right regulatory framework that rewards climate protection strategies of the industry and a bold funding program to compensate initial costs, we can support companies on their way towards green manufacturing today.

Second, it makes clear that additive manufacturing is a key technology for the future. The worldwide demand for industrial 3D printing systems will most likely spike over the next decades. To secure competitiveness and reduce emissions, most countries must evolve their economy towards an “Industry 4.0”.

The factory of tomorrow is digital, sustainable, and flexible. And makes use of additive manufacturing technology. Additive manufacturing has been developed and improved mainly by European technology leaders. But other countries are catching up quickly. Especially China and the US are investing heavily in creating national champions for additive manufacturing. If we want to secure our position as thought leaders worldwide, we need a common European strategy for additive manufacturing that supports local manufacturers.



*EOS provides responsible manufacturing solutions via industrial 3D printing technology (metal and plastic) to manufacturers around the world.*

# GREEN MACHINE TOOLS CAN BENEFIT THE PLANET – AND THE BOTTOM LINE

– by Bruno Munier, Deputy European Managing Director, Mazak

Choosing the right machine tools can help manufacturers meet the increasingly urgent pressure, as highlighted by COP26, to go green. Yet such choices need not simply be of altruistic benefit to the planet; saving energy and improving efficiency also contribute significantly to manufacturing productivity and profitability.

## GREEN MACHINES

Modern machine tools are increasingly equipped with a host of energy saving features. Their design incorporates advanced technologies in areas like the chiller unit, the hydraulic unit, and the lubrication system. Mazak's next-generation 5-axis simultaneous Vertical Machining Center VARIAXIS i-800 NEO, for example, is a fast, compact machine that reduces running CO2 emissions by 22.7% compared to the previous model.

Other savings are possible: CNC displays, chip conveyors and even high efficiency LED lights can be automatically shut off after a predetermined period for lower power consumption when machines are on stand-by. High efficiency hydraulic systems also lower overall electrical power consumption.

Monitoring machine operational status over a factory network can also inform decisions to improve energy efficiency. Energy dashboards can display energy consumption, with live updates, weekly and monthly totals. They can additionally measure the level of CO2 generated during production.

Hybrid machines that combine processes on a single machine can reduce cost and environmental impact. Mazak's hybrid Multi-Tasking range, for example, now includes additive manufacturing, friction-stir welding, and gear machining.



Bruno Munier

But it is not just about the machines: automation and technology solutions like the MAZATROL SmoothEz use a 15" touchscreen and an intuitive operating system to deliver increased efficiency through faster setup, programming, and operation for those with limited NC programming experience. Efficiency is also improved with virtual machining techniques that use artificial intelligence (AI) and Digital Twin technologies. These deliver machine and engineering data directly to those who need it for production planning and business decisions.



"Mazak's VARIAXIS i-800 NEO next-generation 5-axis simultaneous Vertical Machining Center is fast, compact, and environmentally friendly"

## SUSTAINABLE FACTORIES

Machine tools can contribute to sustainability through the environment in which they are manufactured as well as their own operating performance and efficiency.

Factories that produce machine tools should be certified to ISO 14001, an international standard confirming that operating its production facilities does not adversely affect air, water, or land.

In the UK, manufacturing sustainability policies can be demonstrated by factories certified to BSI Standard BS EN ISO 14001:2015. Compliance with this legislation helps to protect the environment, prevent pollution, and meet other relevant commitments.

Energy performance is continuously improved through applying the BSI ISO 50001 Energy Management System. This includes avoiding energy waste, and setting achievable objectives and targets for reductions in energy use. It also covers investigation of possible alternative energy efficient technologies, and designing energy efficient products.

Machine tool manufacturers should perform detailed monitoring of their premises' energy consumption, and present the results on a dashboard for review and analysis.

Using a factory roof to harvest solar energy is one way of going greener. In the UK, it can offer a potential to obtain 20% of a site's electricity from solar power.

As part of its commitment to reducing its environmental impact, Mazak implements the above measures within its Japanese and UK facilities

## 'DESIGNED-IN' SUSTAINABILITY

Machine tools, by the way they are built and operated, can help manufacturers reduce their carbon footprint. For Mazak, the ultimate goal is for their machines to have an environmental efficiency factor four times greater in 2030 than in 2010.

Energy dashboards and digital services allow users to measure energy utilization and the CO2 impact of specific machining functions. This will support those adopting a cradle to grave approach, measuring the total greenhouse gas emissions of a product from raw material extraction, through manufacture, distribution, and use, to eventual disposal.

Measuring CO2 for the total consumer product life cycle is gradually extending through the manufacturing supply chain to machine tool owners. Essentially, the traditional 'Price + delivery' calculation is likely to become 'Price + delivery + CO2 impact'.



**Standardization bodies must develop an approach that helps machine tool companies to maximize the environmental performance of their products.**

– Juan Andueza, Managing Director, DIMECO

# MACHINE TOOLS CAN LEAD THE TRANSITION TOWARDS A CIRCULAR ECONOMY

– by Stefano Ramundo Orlando, Technical Regulations Officer, CECIMO



The current shift towards a circular economy will inevitably require a leading role from Europe's manufacturing sector. Considering that machine tools are at the starting point of most industrial value chains, and thus have a hand in most manufactured products, they have the ability to directly impact the productivity and competitiveness of almost every manufacturing process.

For this reason, at CECIMO we believe that machine tools are a key enabling technology with a high potential to become the catalyst for a large-scale transition towards sustainable manufacturing. In particular, their product characteristics, which allow for extended lifetimes, optimal reuse, refurbishment,

remanufacturing and recycling of products and materials, indicate that they would be an optimal candidate to enhance the scope for sustainable manufacturing in Europe, thereby contributing to Europe's transition towards a circular economy.

With regards to the materials used for production, although machine tools are generally very diverse, around 83% of the machines are mainly made of cast iron, welded steel, and other metallic materials.

Therefore, the predominance of recyclable materials such as cast iron, steel and other metals in the composition of machine tools can greatly facilitate our sector's ability to replace virgin materials with recycled secondary raw materials, in a circular manner, on a European scale.

With that said, the circular economy concept goes beyond the recycling of product materials. The key elements to consider here are the lifetime, reuse and remanufacturing of products, which allow them to retain as much value in the economy for as long as possible.

These materials are easily recyclable and can be used to produce new products again and again with no loss of quality. In addition, metal components are economically valuable, and there is an incentive for metal to be recovered during the disposal of machine tools at the end of their lifetime – either by the manufacturer or by dedicated scrappers.

According to the Ellen MacArthur Foundation, the overarching goal of circular economy is to retain as much value as possible for as long as possible in the economy, also in terms of product materials.

In this regard, machine tools represent an ideal field for applying circular economy approaches since they are products with a long lifetime, which are highly prone to be repaired, reused and remanufactured. Data provided by our manufacturers shows that, on average, 80% of machines are still in service ten years after installation, while 65% are still in service after 20 years, thereby providing evidence of the durability and long lifetime of machine tools.

Furthermore, given their relatively high value, the repairing and remanufacturing of machines is very common in our sector, varying from small improvements to full rebuilds. According to data from the Ecodesign preparatory study on machine tools, 80% of machine tools are retrofitted and refurbished when they are between five and 15 years old depending on the specific sector and application. This is because machine tools are usually designed in a modular way.

To reduce down-time of the machine in case of problems, access to key components for replacement is very much taken into account in the design of the machine. This simplifies maintenance, helps to reduce construction costs and facilitates remanufacturing and disassembly at the end of life. When a machine tool is remanufactured, it is often possible for newer more energy efficient components or controls to be added, thus leading to a reduction in the energy consumption of the whole machine.

Therefore, based on the available evidence, it can be argued that machine tools already embrace some key principles of the circular economy, especially in terms of production, products and materials. Given their critical position as the starting point of almost every manufacturing activity, machine tools are a key enabling technology that can have a direct impact on the productivity and competitiveness of European manufacturing, and ultimately in the transition towards a circular economy.



# STANDARDISATION

## UMATI – OPEN INTERFACE STANDARDS UNDER A UNIFORM BRAND

– by Dr. Alexander Broos, Head of Research and Technology, VDW (German Machine Tool Builders' Association)



Dr.-Ing. Heinz-Jürgen Prokop

Connectivity is key for all machinery in the 21st century and a basic requirement for the next steps in automating production. But since a lot of companies have various machines of different ages, from different manufacturers, and with different controllers, it is not possible simply to connect them to existing IT systems. Interfaces need to be programmed individually and that costs both time and money. Moreover, some data is not even being recorded. For the benefit of users of machinery, and the machine building industries themselves, umati tackles this issue by promoting open standards throughout the world. umati stands for universal machine technology interface and is the worldwide community aimed at promoting OPC UA standards in mechanical and plant engineering.

Supported by VDW and VDMA, we pursue the goal of uniformly implementing different OPC UA specifications so that manufacturers of machines, components and software can offer their customers and users genuine plug and play – simply, seamlessly, and securely.

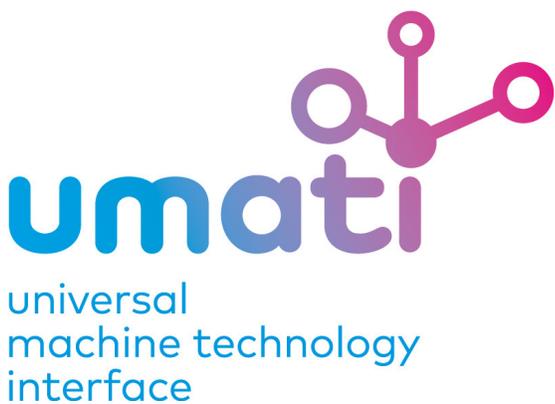
One of the specifications is OPC 40501-1 “UA for Machine Tools”, the first version of which was released in September 2021. All companies that manufacture machines, components such as controllers, software for machine tools and IT systems in the production environment can now develop and refine their products based on this specification – worldwide and free of charge. It was also the first to be published with reference to the overarching specification for the entire machine and plant engineering industry, OPC 40001-1 “UA for Machinery”. The machine tools working group is already working on standardizing additional analysis data for KPI evaluations, too. Publication is scheduled for the first quarter of 2022.

In October 2021, EMO Milano was the first occasion in a long time at which everyone could meet in person on an international stage. Of course, umati was also there – with its own booth, information event and live demonstration. More than 50 machines were connected, almost half of them remotely.

Via the updated umati dashboard, interested parties were able to observe their activity and status directly. Several woodworking machines were also present for the first time. They had been integrated into umati's ecosystem via the OPC UA for Woodworking specification just one week prior to EMO. Also, the connectivity of IT, MES and ERP systems was proven through the first production-ready interface implementations in well-known MES systems by our partners mpdv, IGH-Infotec and Orchestra.

But umati is more than a global initiative for open and standardized OPC UA interfaces – it is a community of nearly 200 strong partners that uses a contemporary and uniform brand profile to communicate the message to the outside world. The common goal: to create greater visibility and to anchor umati in the minds of decision-makers – thereby convincing even more companies of its advantages. EMO Milano as the leading world metalworking showcase saw many more premieres from the umati community: a new image film explains in less than three minutes how production becomes more efficient with umati and how it helps users to save time and money.

The latest versions of brochures explain the basic benefits of umati, the current specifications, and which tasks and use cases are ongoing at present. The brand-new sales folder allows interested parties – from machine operators to plant managers – to identify their precise needs: several use cases are illustrated which explain the different parts (also known as profiles and facets) of the OPC UA for Machinery and OPC UA for Machine Tools interfaces. This brochure was explicitly created to assist machine tool builders in their sales efforts.



Dr. Alexander Broos

umati has repeatedly demonstrated how global data connectivity works and how standardized interfaces enable the development of products across the entire value chain. And the initiative has only just started. As the global trade shows return, more and more leading events around the globe will see an umati live demonstration – the next will be SPS in Nuremberg, followed by the VDW trade fairs METAV and GrindingHub, and the CCMT in China.

Keep in touch with umati and all interested parties during and after the trade fairs via our website [umati.org](http://umati.org) and our social media which are fundamental channels of information for insuring everyone stays up-to-date. And remember: pink and blue, the umati colors, are there to serve you and your customers by making connectivity easy, secure, and seamless.



**“umati is now no longer an initiative exclusively for the machine tool industry, but for the machinery and plant engineering sector as a whole. Thanks to the efforts of the VDMA, numerous OPC UA Companion Specifications have already been developed for the ‘world language of production’ – or are currently in progress.”**

– Dr. Heinz-Jürgen Prokop

# SUSTAINABILITY IN STANDARDIZATION

– by Marcel Schulze, Standards Manager, Swiss Association for Standardisation (SNV)

It was around 50 years ago when the club of Rome published the book “limits of growth” by Meadows et al. which triggered environmental thinking and resulted in a political and societal momentum. Twenty years later, the UN’s Rio de Janeiro convention in 1992 had already formulated 27 environmental principles, which also included sustainable development concepts (Rio Declaration of environment and development). As a result, themes related to climate change, environmental pollution and biodiversity are nowadays highly represented in the media.

So let us have a closer look at the term “sustainable”. In the ISO Guide 82:2019 “Guidelines for addressing sustainability in standards” the definition for sustainable development reads as following: “development that meets the environmental, social and economic needs of the present without compromising the ability of future generations to meet their own needs” (derived from the Brundtland Report). Thus, sustainable development is a far more comprehensive approach than a purely environmental one as it includes economic and social aspects as well.

Decades later in 2015, the UN formulated the 17 sustainability goals. ISO reacted in a very systematic way by assessing all standards under its roof with respect to their potential to support the 17 UN SDGs and to monitor standards where they already support the UN SDGs. This illustrates that standards played and still play an important role for sustainable development. Meanwhile, ISO created ISO/TC 323 on Circular economy, ISO/TC 331 on Biodiversity and many others that develop standards aiming directly for the protection of the environment and the transformation of today’s economy from “End of life” and “waste” to an economy which closes the circles.

On the European level, CEN SABE (Strategic Advisory Board on Environment) and the CENELEC TC 111x were the panels which primarily addressed the environmental topics. Today the two committees are merged to one committee which should advice the CEN and CENELEC Technical Boards (CENCENELEC-SABE).



Marcel Schulze

It must be acknowledged that the European Commission has a strong and ambitious sustainability agenda, with the New Green Deal being the most recent major initiative. In this regard, SABE acts as contact point for the European Commission to exchange information, formulate its needs and the identification for future standardization needs with respect to sustainability topics.

The standards organizations ISO, IEC, CEN and CENELEC began in the late nineties to create concepts that could make standards “greener”. For this reason, the ISO Guide 64 (CEN Guide 4) “Guide for addressing environmental issues in product standards” addresses any standards writer to assess systematically their standards for the inclusion of environmental considerations.

In 2010, ISO set forth with the publication of ISO 26000 on “Social responsibility,” marking an important milestone to address sustainability in a comprehensive manner.

Recently, the financial sector became a proactive player in this field with the multiple “Green bond standards” initiatives. With the publication of the ISO 14030 series, a standard family is being developed in order to allow portfolio managers to assess their financial decisions on the basis of their respective sustainability.

In conclusion, based on the aforementioned sustainability initiatives that have been, it can be argued that sustainability aspects are playing an increasing influence in the field of standardization, and thus the demand for creating standards that address sustainability will prevail and likely increase over time.

# EUROPEAN STANDARDS: ESSENTIAL TOOLS FOR THE DIGITAL TRANSITION OF THE MANUFACTURING INDUSTRY

– By Elena Santiago Cid, Director General, CEN and CENELEC



Europe is digital. From societal issues to economic competitiveness, from our homes to our workplaces, up to the way we see the world, the digital revolution affects all aspects of life.

New technologies evolve rapidly, fuelling economic growth, but also raising societal concerns related to safety, security, and privacy, and determining who wins or loses in the global economy.

These challenges and opportunities, which have been accelerated by the Covid-19 pandemic, are at the core of European ambitions: in its most relevant strategic documents, such as the Industrial Strategy, the EU's new trade policy and the upcoming European Standardization Strategy, the European Commission indicates digitalisation as one of the two priority "twin transitions".

In this ambition, standards play a key role. Thanks to the robustness, inclusiveness and resilience enabled by the European Standardization System, standards support security and safety in goods and services, ensure interoperability and build trust in emerging technologies.

CEN and CENELEC are committed to providing the European industry with the necessary tools to power the digital transition. Digitalisation is one of the goals defined in our Strategy 2030, where we set the path to continue building a strong, resilient and future-proof system.

In this journey, we are determined to strengthen the global outreach of our international partners organisations, ISO and IEC, to jointly develop standards applicable all over the world.

We cannot engage in the digital economy without paying due attention to cybersecurity. This is particularly true for the manufacturing industry, as cyberthreats can have a detrimental effect on any company, no matter its size. CEN and CENELEC, fully aware of the relevance for all industry sectors to be prepared to confront these risks, established the horizontal Joint Technical Committee 13, devoted to the development of standards for cybersecurity, privacy and data protection. In addition, CEN/TC 114 'Safety of machinery', together with ISO, developed CEN ISO/TR 22100-4:2020 to provide manufacturers with assistance regarding the impact of cybersecurity on machine safety.

Another challenging but promising area for standardization is Artificial Intelligence, with data quality and data management playing a crucial role. The recent establishment of the Joint Technical Committee 21 'Artificial Intelligence' shows our commitment to the development of trustworthy AI systems that respect fundamental values and human rights. We aim to support European policy objectives with market-driven, voluntary solutions, enabling innovation and engaging industry, society and academia in this evolving subject.

Finally, another relevant topic is automation: CENELEC/TC 65X adopts standards for systems used for industrial process measurement, control and automation. The EN IEC 63278 series – under development in cooperation with IEC – will be a key element for semantic interoperability in data ecosystems for manufacturing, together with EN IEC 63365 on digital nameplate. In addition, EN IEC 61406 will establish a unique machine-readable identification to be attached to the physical device in the data format of a link.

A considerable share of standards in this domain are intended to be offered as Harmonised Standards (hENs), so that the industry can benefit from the full advantage of the European standardization model, reducing compliance costs with presumption of conformity with EU legislation, at the same time enabling innovation in the Single Market.

But to succeed in the Digital transition, it is critical to move away from a silos-based approach and embrace the horizontal character of digitalisation to deliver common sets of standards applicable across sectors. An example is the discussions surrounding the applicability of the EN IEC 62443 series on security for industrial automation and control systems, where security-related requirements could be made applicable across different sectors, fostering a common approach that can be replicated in different ecosystems.

We are fully aware of the importance of good cooperation between CEN, CENELEC and ETSI. A good example is the CEN-CENELEC-ETSI Coordination Group on Smart Manufacturing, which contributes to the synchronisation of standardization activities. The ongoing CEN, CENELEC and GAIA-X initiative on venues of cooperation on standardization will certainly provide valuable input to this Coordination group.

Finally, it should not be forgotten that the engagement of our stakeholders is fundamental to deliver standards that are fit for purpose. The long-standing collaboration with CECIMO and its involvement in European and International Standardization as a Liaison Organisation showcases what we can achieve when we work together. We invite all those interested in the industry to do the same and engage with us!



Elena Santiago Cid



**The digital revolution is here to stay. Together, we can make sure that Europe will be a protagonist in it for many years to come.**

# RESEARCH AND TECHNOLOGY

CECIMO Projects - State of Play

## TRINITY

– By Gabriele Favaro, EU Policy Officer and Project Coordinator, CECIMO



 This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825196

TRINITY has almost reached the beginning of its fourth and last year. This project, funded in the framework of Horizon2020 (the European Commission programme for research and innovation), has already targeted most of its objectives and demonstrated to be a functional Digital Innovation Hubs umbrella network, collecting a significant number of success stories. You can read one of them 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 recent updates.

The aim of the TRINITY project is to help European SMEs to improve their agility and innovation capabilities. The project started in January 2019 and will end in June 2023. One of the most relevant sides of it will be the creation of a digital access point which is under development in these weeks and will facilitate access to collaboration, networking, and the dissemination of information to the wider robotics research community and industry in Europe. As the name suggests, Trinity focuses on three main themes: advanced robotics, digital tools and platforms, and cyber-security technologies. Accordingly, Trinity's network aims to become a one-stop-shop for robotics methods and tools to achieve intelligent, agile, and reconfigurable production.

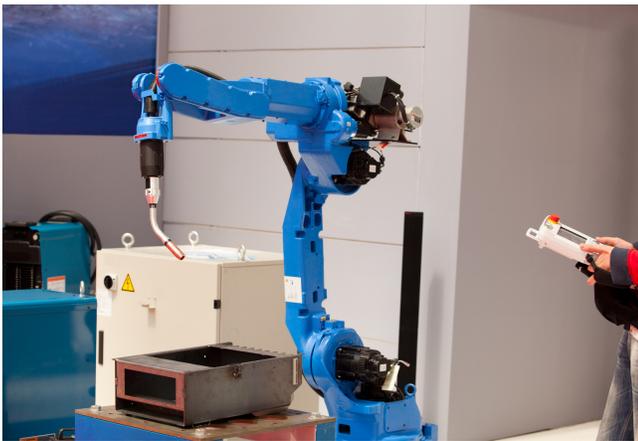
CECIMO promoted the project's initiatives during fairs and events such as EMO Milano 2021. Trinity had a dedicated booth during the Exhibition, where the partners showcased two solutions developed by the project: reconfigurable robotic cell for automated recycling and the Smart Clamp drilling, a solution that reduces the load on machines and workpiece. In addition, the project latest developments have been presented during an event focused on 'Innovative Trends in Agile Manufacturing' and presented some of the solutions that have been developed during the first three years of the project.

Furthermore, thanks to a series of online events, we have showcased robotics applications in different industrial contexts, such as in support of Additive Manufacturing technology, sensors, and human-robot collaboration. These events have been organised especially during the first part of 2021 due to Covid restrictions. Indeed, after EMO we are planning other in-person events for the rest of the project, surely more attractive to grasp the reach of the developed technological innovations.

Last year, 19 SMEs, selected in the first round of open calls developed their use-cases about innovative robotics applications for agile and advanced manufacturing. After ten months of activities, the areas of experimentation included collaborative robotics as well as sensory systems to ensure safety, effective user interfaces based on augmented reality, reconfigurable robot work-cells, peripheral equipment, IoT secure wireless networks.

On the other hand, the second demonstration programme started in November and involved 18 new partners funded with up to EUR 200,000 each. The participants have been selected among 77 eligible applications including 203 potential partners. Following the European Commission indications, the second open call targeted relevant results in terms of improved gender balance among demonstrations' appointed leaders with 49% of female coordinators. Additionally, EU13 countries have been involved and participated to the open call, which has selected SMEs coming from 34 countries.

Being part of the Trinity demonstration programme is not only a matter of funding, which overall amounts to EUR 8,1 million. The contribution of the project towards SMEs and DIHs also concerns its ability to generate a multiplier effect to the visibility and outreach of the organisations involved through access to experts' pools and tailored support for the implementation of manufacturing innovations. The detailed description of the different demonstrators can be found on the TRINITY website.



## The RAISE™ Project (Robots as an AI Services Ecosystem)

– by Fabrizio Cardinali, Founder & Co-CEO MYW.AI



Automation has historically been very capital intensive, and generally requires hefty upfront capital costs (CapEx). This has kept many smaller organizations from investing in robotics and prevented larger ones to take on more risks. Today a new business trend is hitting the manufacturing model delivering technical Equipment as a Service (EaaS) on a monthly operational subscription fee (OPEX) rather than a one-off product sale.

Robots as a service (RaaS) is a growing business model of the EaaS stream that allows companies to lease robots and tap into a cloud-based marketplace for technical (e.g., predictive maintenance) and non-technical (e.g., fintech, insurtech) services to be delivered to the end user via connected equipment. RaaS makes it easier for small and medium-sized enterprises to start enjoying the ease of use of robots in their production workspace, eventually paying a subscription for the outcome they produce on a OPEX basis.

If you match this with the fact that cumulatively, Fortune Global 500 (FG500) manufacturing and industrial firms are estimated to lose 3.3 million hours a year to unplanned downtime (source LLB Finance Reporter), conceiving new, innovative aftermarket RaaS platforms to deliver a continuum of “right on time” services from Robots shipment to subscription, warranty extension and JIT maintenance until their circular displacement has become not only possible, but crucial to get Robots and other high tech machine tools at the door front

of manufacturing companies smaller in size, yet underpinning hugely wider markets. than those usually served by tools manufacturers.

The new RAISE™ project has been indirectly funded by the EU H2020 RD Program (Grant nr 825196) via the Second Open Call issued by the Trinity Robotics work program awarded to the innovative European startup MYW.AI™ to develop a new RaaS Platform adding insurtech and fintech services to the prognostic maintenance algorithms developed during the MYWAI 4 Robotics demonstrator awarded during the first Trinity call.

MYW.AI™ is a new European startup ([www.myw.ai](http://www.myw.ai)) with headquarters in Italy, which despite the hurdles caused by the pandemic, designed, patented and developed Europe's first fully native EaaS solution to help machine tool builders add maintenance service providers to deliver their services to distributed machines connected to the Internet by means of IoT sensors and digital cameras. This helped empower time series fault analysis and visual inspection from remote service centers, over the Internet.

“Suddenly, during the Covid pandemics, the world realized that in the age of Internet of (every) Things, it makes no sense to send maintainers every time your equipment breaks down, to ship spare parts once your machinery is halted or to ask customers to continue to pay systems when they are low in production” claims Fabrizio Cardinali, MYWAI founder and Co-CEO .

“Rather it makes much more sense to connect your machinery, being it either an industry 4 Robot, a medical equipment or an energy appliance, directly to the Internet of Everything, making it secure and smart ‘by design’ able to deploy AI algos at the very edge, on deck, using chip based Artificial Intelligence and blockchain certified data streams”.

“With such vision”, continues Cardinali, “we have designed and patented the MYW.AI platform in the worst period for Industry over the last 100 years, to help machine tools vendors and users across the world embrace smart machines and robots servitization for the next 10 years ahead and beyond”.

The MYW.AI platform will bring robots-as-a-service (RaaS) business models to new heights allowing customers to fund their machinery needs with zero upfront capital commitment. With the RAISE™ model, similarly to what happened with the advent of software as a service (SaaS), pay-as-you-go or subscription-based service model, will come to robotics. Customers will only pay a flat monthly fee to subscribe to a the RAISE™ marketplace service including 24x7 uptime remote workforce monitoring scheduling, anomaly detection and prognostic maintenance, together with other non technical services such as fintech payments and/or robots insurtech policies underwriting.



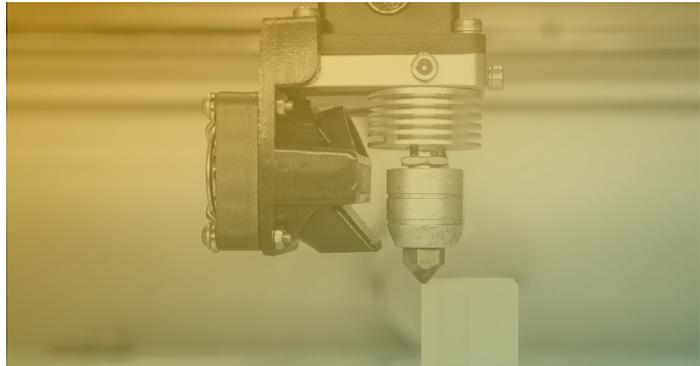
# SAM AND THE URGENCY TO SOLVE THE EUROPEAN SKILLS SHORTAGE IN AM

– By Gabriele Favaro, EU Policy Officer and Project Coordinator, CECIMO

SAM, the Sector skills strategy in Additive Manufacturing project, tackles the current European need of developing an effective system to identify and anticipate the right skills for the Additive Manufacturing (AM) sector demands in response to the increasing labour market needs, thus, contributing for the smart, sustainable, and inclusive growth of the AM sector.

It has been identified also as Blueprint Alliance for Sector Skills Strategy in AM. The consortium started its activities in January and will finish in December 2022. As we are getting close to the end of the project, next year will be focused on making the results fully operational and sustainable in the long run. The long-term objective of the project is to deploy the International AM Qualification System (IAMQS), through a network of training providers and a wide range of industrial sectors that are applying Additive Manufacturing in their activity with the purpose of educating, preparing, and upskilling the workforce for the AM sector.

The IAMQS is composed by a set of qualifications for different proficiency levels, grounded on industry requirements and validated by experts. This system aims to become the reference point for a univocal identification of skills in Additive Manufacturing as well as building a clear and understandable framework for learners. However, we are just at the beginning of a job market revolution and the European workforce need to keep the pace of innovation. Additive Manufacturing has been identified as one of the Key Enabling Technologies for the new 4.0 industry, a sector that will be crucial for the next decade to guarantee competitiveness and development to European Industrial Policy. As for every new and growing technology, one of the primary problems is the disaggregated information the wider public has about it.



That is because there are only few university courses about AM, and the hiring companies end up dealing with badly prepared graduates or not skilled workers. SAM project wants to aggregate the information that concerns AM from every point of view or interest.

In order to foster the aggregation of information, the system is supported by the AM Observatory. As planned, it has been launched on the website including information on technology development, job market, and other useful insight on Additive Manufacturing, developing the digital structure which will contribute to make the project sustainable after its end.

Indeed, the consortium has developed and consolidated the IAM Qualification Council and the IAM Industrial Council. Namely, the Working Groups have defined the structure of the two Councils. SAM has identified two Working Groups, made of around 100 experts divided into the categories of Metal and Polymers AM.

As a result of the engagement of SAM consortium with external AM experts, the Working Groups have started their activities and have been operating for one year. For instance, the Metal WG, led by David Wimpenny from MTC, has been the responsible for the review and development of the International AM Qualifications (IAMQS) and Units of Learning Outcomes based on the industrial needs identified by the SAM project and validated by industry during the first validation workshop.

Finally, with the relaxation of the Covid restrictive measures, SAM had the opportunity to be present at EMO Milano 2021 and has been promoted by CECIMO with promotional material and two specific information sessions.



This project has received funding from the European Union's Erasmus+ Programme

# PENELOPE - THE IMPROVEMENT OF LARGE-SCALE PARTS MANUFACTURING IN THE EU

– By Gabriele Favaro, EU Policy Officer and Project Coordinator, CECIMO

The consortium, made of 31 partners based in 10 European countries, started the activities in November 2020 with an overall budget of EUR 21 million and has foreseen three wide-scope purposes: creating digital pilot lines, training the workforce, and developing a benchmarking approach for the industrial ecosystem.

PENELOPE focuses on large-scale parts manufacturing and its technology is being deployed in four pilot lines in strategic manufacturing sectors (Oil & Gas, Shipbuilding, Aeronautics and Bus & Coach). Its main challenges involve increasing complexity in design and manufacturing setup, limited production efficiency and product quality, raw materials scarcity as a major issue for increased production cost, and preservation of the industry-specific knowledge and skills. In order to tackle these issues, innovation resulting from PENELOPE project relies on developing and adopting technologies such as simulation models, Digital Thread, Digital Twin, online control & inline inspection, data analytics and AI tools, a broad range of worker-centric tools towards the future modular and flexible factory 4.0.



Going into details, the project aims to reach the following specific objectives:

- Develop a closed-loop data driven pipeline for a Collaborative product-service Factories scheme to achieve precise manufacturing of large-parts from early design.
- Implement a digital architecture for modular, reconfigurable, scalable, decoupled, and distributed production of large parts.
- Design a zero-defect manufacturing strategy based on online control, distributed quality assurance and Artificial Intelligence.
- Implement worker-centric tools assisting in the execution of the labour-intensive tasks by preserving industry-specific workers' knowledge and skills. To do that, PENELOPE takes advantage on the latest developments on VR/AR, exoskeletons, mobile and/or collaborative robots, building a modular and flexible work environment.
- Demonstrate Penelope approach in real-scale for the manufacturing of large-scale high-precision components to enable EU-wide manufacturing adoption.



This project has received funding from the European Union's Horizon 2020 research and innovation programme



## **PENELOPE'S CONTRIBUTION TO THE EU MANUFACTURING INDUSTRY**

PENELOPE's coordinator, Félix Vidal Vilariño, Head of Robotics and Control Unit at AIMEN Technology Center, has underlined several times that the impact of the project's activities will influence the entire European manufacturing industry and ease the transition of SMEs towards industry 4.0 production.

PENELOPE is implementing a digital manufacturing approach leveraging the potential of Internet of Things (IoT), simulation models, digital twins, heterogenous data-exchange, Artificial Intelligence (AI) algorithms, robotics and user-centric tools for developing a data-driven pipeline, linking product-centric data management and production planning and scheduling, for defining a more precise, responsiveness and productive manufacturing strategy from initial design.

The transformations brought about by PENELOPE will support and enhance the transformation of EU industry and will be replicated, especially for the manufacturing of large-scale components, by a pan-European network of Didactic Factories and showrooms, providing workforce training and skills development to industry.

For the upcoming year, it is expected that PENELOPE will start developing training methods, enabling the EU industrial workforce to transition towards Industry 4.0. ensuring safety, accuracy and precision on manufacturability in all stages from design to the final product for the overall benefit of the EU manufacturing sector.

# DIMOFAC

– By Gabriele Favaro, EU Policy Officer and Project Coordinator, CECIMO

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 the way to more responsive production lines.



This project has received funding from the European Union's Horizon 2020 research and innovation programme

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.

# CECIMO NEWS AND INSIGHTS

## CECIMO APPOINTS NEW PRESIDENT

The European association of the Machine Tool Industries and related Manufacturing Technologies elects at its 2021 Fall meetings a new President for the 2021–2023 term of office.

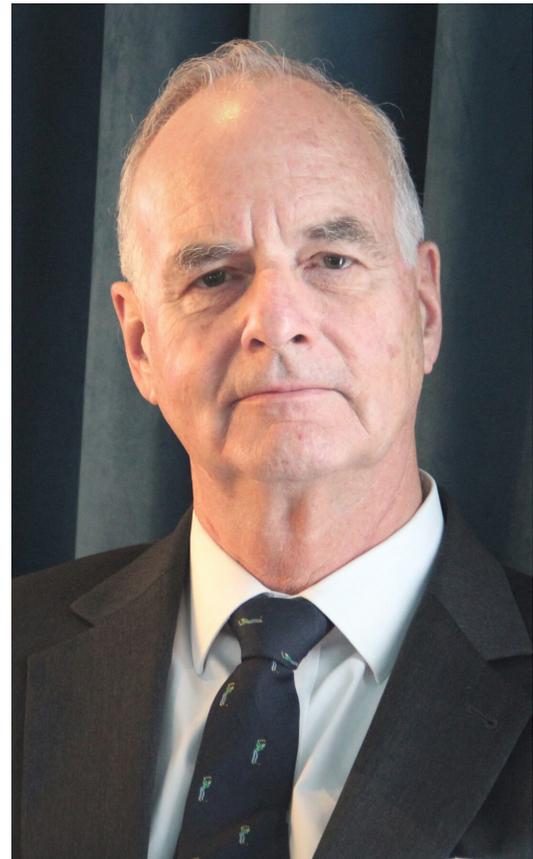
Dr.-Ing. Heinz-Jürgen Prokop takes up the position of CECIMO President for the 2021–2023 term of office. He has a proven track record of success in leading the development and execution of corporate goals and has served in a number of senior executive positions.

At the completion of the 2–years term, Dr. Hans-Martin Schneeberger leaves the board in the capacity of CECIMO President. During his presidency, Dr. Schneeberger was committed to shaping the future of our industry: working with policymakers and stakeholders to strengthen our industries' growth and global leadership, to maximise their contribution to Europe's economy, and foster innovation and technological change.

CECIMO President Dr.-Ing. Prokop affirmed that the prosperity of the machine tool industry is of the utmost importance on the recovery of the European economy and the competitiveness of the manufacturing sector in the EU. In that respect, during his presidency, CECIMO will closely follow the initiatives of the European Commission centered around the updated industrial strategy and green and digital transitions.

The EU should continue to focus on implementing fair rules and promoting its main assets, such as the advanced manufacturing sector. In that respect, through its engagement in Industrial Forum, CECIMO will supporting advanced manufacturing in leading the green and digital transitions while ensuring competition and positive market growth. During his mandate, CECIMO will continue promoting the manufacturing competitiveness driven by investing in digitisation, sustainability and innovation.

The following years will be crucial to fostering access to data and adopting innovative solutions in different sectors aiming to improve existing processes and develop new business models while boosting innovation and job creation.



Dr. Hans-Martin Schneeberger, CECIMO President  
2019–2021

Therefore, CECIMO will continue to actively advocate for a coherent and secure regulatory framework to unlock the full potential of new business models linked to digitalization and avoid unnecessary regulatory burdens to deploying innovative solutions such as artificial intelligence.

Dr.-Ing. Prokop strongly believes that CECIMO can facilitate its members to join forces with peers and deploy pre-competitive partnerships to tackle the biggest industry challenges. UMATI (universal machine technology interface) is a clear example of interoperability across machine-building industries and their customers. Also, we should not leave out upcoming areas such as biologic intelligence.

## WHO IS DR.-ING. HEINZ-JÜRGEN PROKOP?

Dr.-Ing. Heinz-Jürgen Prokop has a degree in engineering obtained from the University of Stuttgart. He started his career within the Institute of Machine Components in Stuttgart where he obtained his doctorate degree in Engineering in 1989.

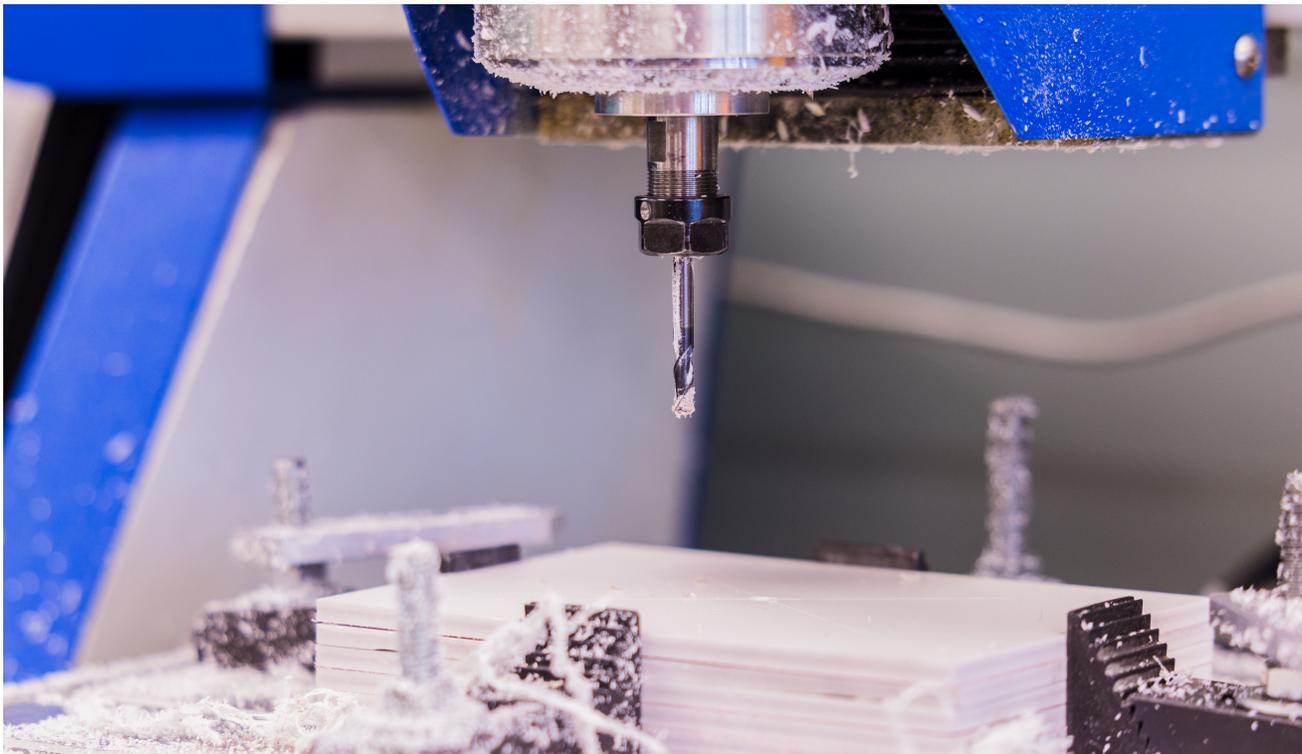
After that, Dr.-Ing. Prokop started as Head of the Design Department at TRUMPF Lasertechnik GmbH in Ditzingen, Germany, in 1988 and was Vice President, Head of Development/Design and production at IHI-TRUMPF-Technologies in Yokohama, Japan, until 1992. After holding various external positions as Managing Director at Thyssen/Krupp in Essen, Fritz Studer AG in Steffisburg, Switzerland, and Frigoblock in Essen, he returned to Ditzingen in 2012 as Managing Director of Development and Purchasing at TRUMPF Werkzeugmaschinen GmbH + Co. KG.

Since 2017, Heinz-Jürgen Prokop has been a member of the Group Executive Board as CEO MT.

Dr.-Ing. Prokop was Chairman of the German Machine Tool Builders' Association (VDW) for the last 6 years and is a Board member of CECIMO since 2020.



Dr.-Ing. Heinz-Jürgen Prokop, new CECIMO President, 2021-2023



# ON THE PATH TO RECOVERY - THE EUROPEAN MT INDUSTRY

- by Anto Jerkovic, EU Public Affairs Economist, CECIMO



**We are pleased to see a positive MT demand outlook despite some of the challenges our sector is facing. Supporting the national recovery packages aiming to increase productivity and boost economic growth, we are confident that the solutions of the European MT builders will be the key drivers for many industries.”**



Marcus Burton, Chairman of the CECIMO Economic Committee

The coronavirus public health crisis has disrupted global activities in almost all countries and industry sectors in 2020. Like other sectors, the European MT industry was hard hit and recorded a sharp decline in orders and production levels. However, with a share of 34% in 2020, CECIMO is still the world's largest producer of Machine Tools, followed by China, Japan and the United States.

Various restrictions on European and global levels and uncertainties regarding new virus variants were one of the main concerns in the first half of 2021. Although the situation of the health crisis has improved worldwide, European producers are still faced with shortages of raw materials, logistics problems and supply chain disruptions.

After the recovery of domestic orders in the last period of 2020 and first quarter of 2021, CECIMO8 domestic orders continued their recovery in the second quarter of 2021, showing a 158% increase over the same period in 2020. CECIMO8 foreign orders also recorded a significant increase of 113% over the same period.

As a result, the total orders index of the CECIMO8 countries in Q2 2021 increased by 119%. Thanks to the positive business climate, bearing in mind optimistic forecasts for MT consumption in Europe in 2022, average order intake is expected to remain stable in 2022. However, challenges related to other sectors such as the automotive sector, which is facing a global shortage of chips, and uncertainty about the coronavirus outlook could impact overall MT demand.

Oxford Economics forecasts that MT consumption in CECIMO countries will increase by 10.5% in 2021 and 15.2% in 2022 (based on EUR levels). These optimistic forecasts are expected to result in higher MT orders and trade between CECIMO countries in 2022. With a 14.1% increase, global MT consumption is expected to reach around 63 billion euros in 2021 and reach 2019 levels with an 11.1% increase in 2022. However, the forecasts also indicate potential changes in key industry indicators in 2021, related to the uncertainty of the COVID delta variant and the fact that supply chain disruption may last longer in 2022. This may cause a delay in economic recovery.

While all major MT purchasing sectors show positive investment growth rates, the highest growth rates in 2022 are expected in the “Aerospace” and “Motor vehicle and parts” sectors. It is important to note that the move towards e-mobility remains a significant challenge for MT builders as automotive companies increasingly focus on developing and producing electric vehicles.

However, from a European industry perspective, it is good to hear that the European Commission has recently revised its forecasts upward. According to the latest forecasts, EU GDP growth is expected to reach 5%, 4.3% and 2.5% in 2021, 2022 and 2023, respectively.

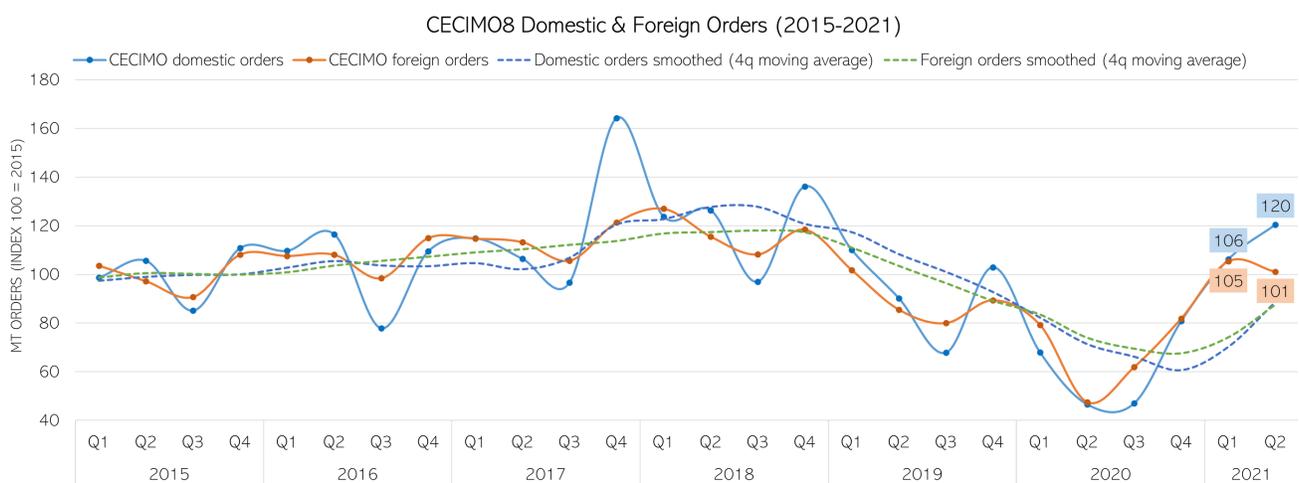
As a result, the EU economy should reach the pre-pandemic output level (2019–Q4) in the third quarter of this year, one quarter earlier than expected in previous forecasts. As for inflation in the Eurozone, it should peak at 3.7% in the last quarter of the year and remain strong in the first half of 2022.

Even the capacity utilization in the investment goods sector in the European Union experienced a slight fall in the third quarter of this year, this indicator reached its “normal” average level standing at 83.9 points.

According to the latest data from IHS Markit, supply-side issues played a central role in the slowdown in Eurozone manufacturing expansion in October. As a result, the Eurozone manufacturing PMI dipped to 58.3 in October, from 58.6 in September.

The companies indicated that demand was ahead of supply for a broad range of inputs and components. In addition to longer delivery times for raw materials, lack of shipping containers, port congestion and driver shortages are some of the supply-side issues that have affected Eurozone companies.

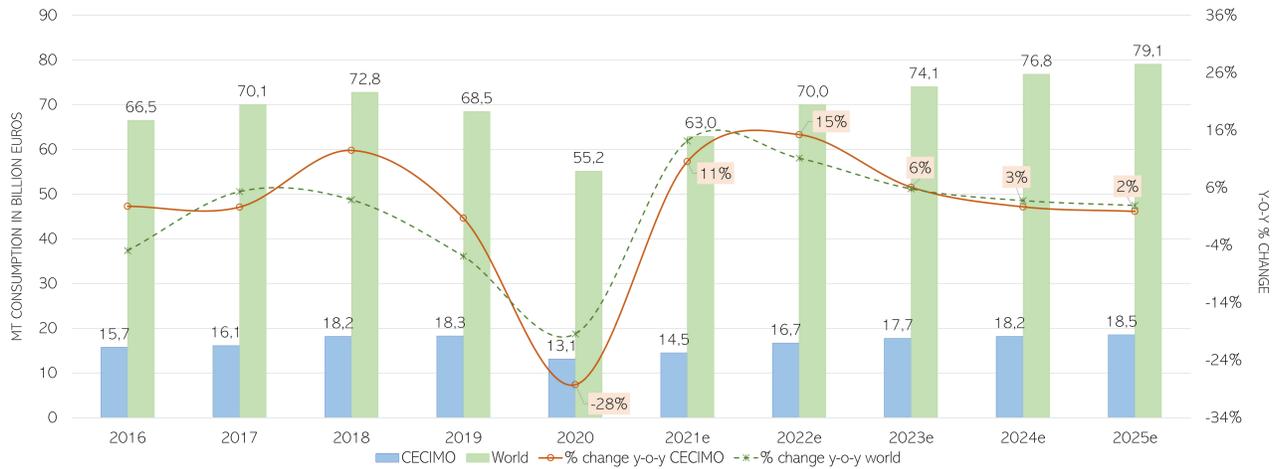
However, the Eurozone manufacturing PMI still indicates expansion, the business climate is optimistic, and expansion is expected to remain stable over the coming period. The favourable general business climate (+30%) and positive demand expectations were also confirmed in the recent results of the CECIMO Business Climate Barometer.



Source: CECIMO & National Associations

CECIMO8 includes: Austria, UK, Germany, France, Italy, Czech Republic, Switzerland and Spa

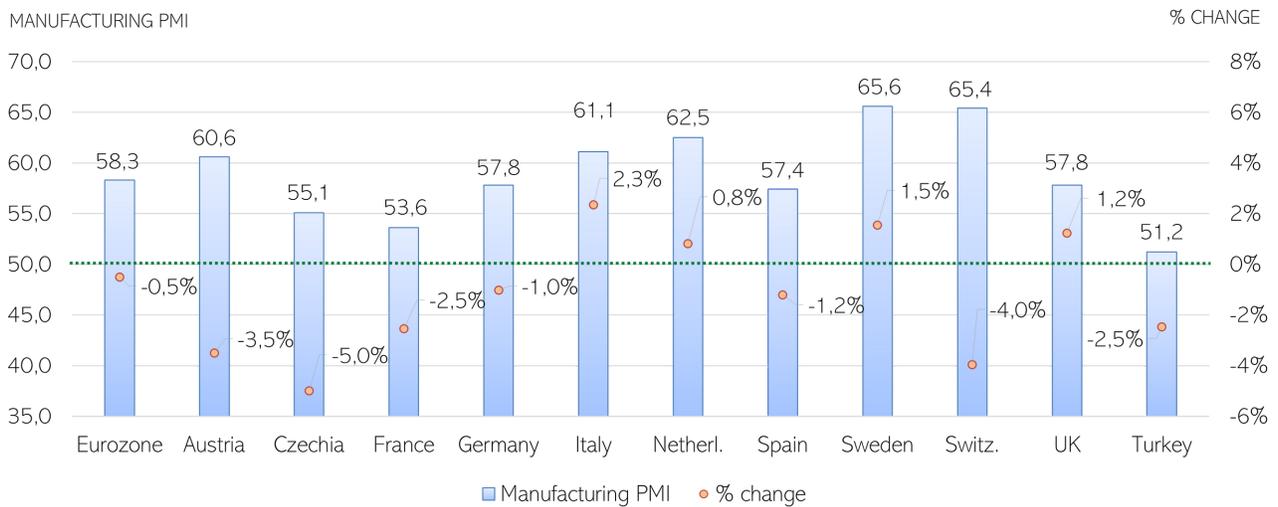
### Machine Tool Consumption Forecast 2016-2025e



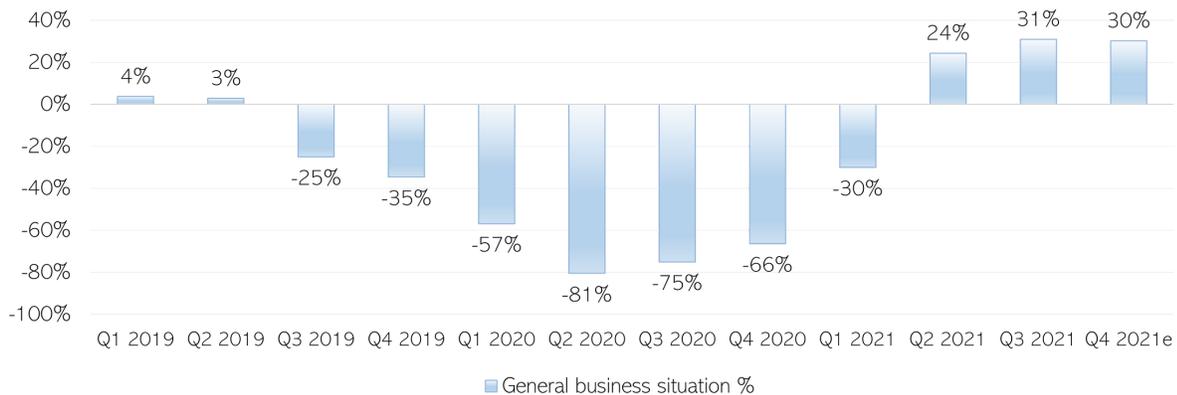
Source: CECIMO & Oxford Economics (Sept. 2021)

2021-2025 estimates are based on OE consumption estimates for Germany, Italy, Switzerland, Austria, Spain, Czech Republic, France, UK and Turkey

### PMI & monthly % change - Europe - October 2021



### CECIMO General Business Climate (2019-2021)



Source: CECIMO & National associations I e - expectatoin

% = weighted average of the national balances (increase-decrease), in %

# ARE QUALITATIVELY GOOD INCOMING ORDER FORECASTS STILL POSSIBLE IN TIMES OF COVID-19 AND DISRUPTED SUPPLY CHAINS?

– Josua Burkart; Benjamin Boksberger, hpo forecasting

For more than two decades, hpo forecasting has been producing order intake forecasts for capital goods. The hpo forecasting approach was developed specifically for the volatile machine tool industry. Besides the general industry forecasts for CECIMO, hpo prepares company-specific order intake forecasts for a large number of renowned companies. These forecasts reflect the company-specific demand dynamics much better than a general industry forecast.

In discussions with customers, we are often asked how hpo could forecast the 2018 crisis and to what extent hpo's forecasting approach works even in times of Corona and disrupted supply chains. Let's take a look back at the following chart. Starting point is Q4 2017 (red dot).

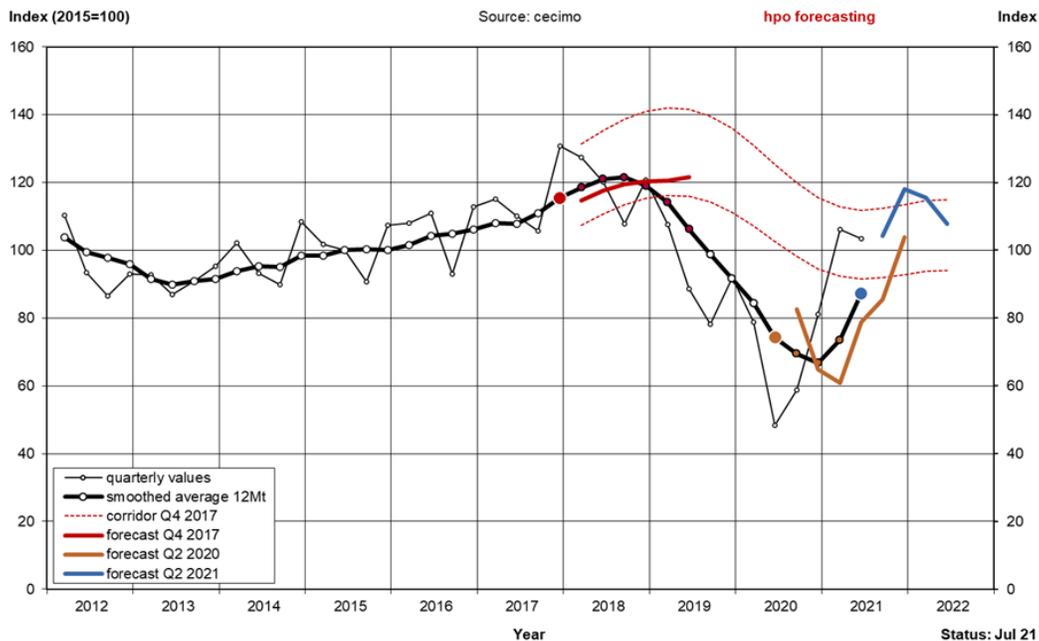


Figure: Order Intake cecimo08 (Source: Actual Data cecimo, Forecasts hpo forecasting).

The actual values are shown as quarterly values (thin black curve) and by means of a 12-month moving average (thick black curve). The thick red curve is the original hpo forecast calculated in early 2018 based on actual data through the end of 2017. Back then, the 18-month forecast showed a sharp flattening of demand. At that time, the long-term forecast (red dashed corridor), which is calculated for corporate customers only, showed a peak in mid-2019 followed by a 2-year downturn. The 18-month forecasts are essentially based on actual economic indicators, while hpo's long-term forecasts are based on our long-term hypotheses, which have also proven to be quite reliable in the past. As we can see from the course of the actual values in black, the peak already occurred in 2018. The weak phase in the automotive industry was an essential reason for the downturn to happen earlier.

While hpo was still perceived as very pessimistic by customers at the beginning of 2018, customers in 2019 would have been happy if demand had developed as forecasted. Even if a difference between the long-term forecast and actual values can be determined, this forecast was extremely helpful for hpo's customers in their strategic planning. At the beginning of 2018, the sentiment was still highly positive. Very few players were expecting a correction any time soon. Thanks to the long-term forecast, hpo's corporate clients could prepare for a prolonged market downturn at an early stage.

In the first half of 2020, it was extremely challenging to assess the impact of the developing pandemic on demand. However, as the 18-month forecasts are heavily based on the most recent actual economic data, the short-term forecast responds quickly to exogenous shocks. The forecast model is freshly calibrated to consider the new factual situation and helps to classify the new development. The brown forecast curve shows that recovery with strong growth in order intake figures was already foreseeable in the late summer of 2020.

In summary, the main power of the hpo forecasting model lies in the early indication of economic turning points, which are particularly relevant for strategic corporate planning. This is where the benefit of hpo's long-term forecasts with a multi-year forecast horizon becomes particularly important.

## LET'S RETURN TO THE TWO INITIAL QUESTIONS:

**How could hpo forecast the 2018/2019 crisis at an early stage when hardly anyone expected an imminent major correction?**

hpo's analysis has shown that in the last 50 years, there has always been a specific constellation of business cycle indicators before significant crises in the capital goods industry. Using our approach, we can identify 2-3 years in advance when such an unstable phase, which has always led to a crisis in the past, will occur again.

**To what extent is the hpo forecasting approach applicable in times of Covid-19 and disrupted supply chains?**

The developments of the last two years have undoubtedly caused demand to fluctuate even more strongly. However, the hpo forecasting approach is characterized by a unique understanding of how various economic indicators affect the real economy and individual industries. The key insight here is that the real economy has similar characteristics to an oscillating system. Using the respective mathematical methods, these complex fluctuations can be modeled and thus also predicted. If an exogenous shock occurs—which fortunately is very rare—the forecasting model will recalibrate after a few months and provide reliable results again.



Josua Burkart



Benjamin Boksberger

Josua Burkart and Benjamin Boksberger work for hpo forecasting ag and continue the work of the company founder Peter Meier. The Swiss consulting firm produces industry and company-specific economic forecasts for industrial companies and is a long-standing forecasting partner of cecimo.

For more information about hpo forecasting and their company-specific incoming order forecasts, visit [www.hpoforecasting.com](http://www.hpoforecasting.com) or send an email to [forecasting@hpo.ch](mailto:forecasting@hpo.ch).

# OUR COMMITMENT TO AN EU INDUSTRIAL POLICY: INDUSTRIAL FORUM

– by Damir Glas, Head of EU Affairs and Communication, CECIMO



CECIMO Team engaged in the Industrial Forum from left to right: Filip Geerts, Director General; Damir Glas: Head of EU Affairs and Communications; Vincenzo Belletti, Head of Innovation Policy.

Despite rapid changes and undergoing transformations driven by new technologies and their impact on social aspects and business models, industrial policy remains the most important pillar of the European economy. Having a strong industrial base is crucial for the EU's competitiveness and growth.

The manufacturing sector is one of the most inventive, contributing to research and innovation in fields such as additive manufacturing, robotics, and artificial intelligence and as such is of strategic importance for Europe and its recovery. The sector has always been driven by innovation and technological change. Industry 4.0 technologies were already transforming manufacturers' operations before the pandemic.

The pandemic accelerated the implementation of digital solutions. Consequently, Europe's resilience, as well as post-covid recovery strategies, must have a digital perspective, and the future of our industry depends on the investments in new technologies and digital skills leading towards successful digital and green transitions.

In that respect, we are delighted that the European Commission has appointed CECIMO's Director General Filip Geerts to join the European Commission expert group "Industrial Forum". The Forum is created under the Industrial strategy, as a concrete tool for co-designing solutions in the context of fostering the green and digital transformations, alongside other stakeholders, with a mandate until 31 December 2024.

Together with a different range of stakeholders, including industry representatives, Member States authorities, NGOs, research institutes CECIMO assists the Commission in tracking the implementation of the Industrial Strategy and contributing to the Commission's work on industrial ecosystems in the context of the recovery, green and digital transformation.

More concretely Industrial Forum's mission and tasks are centred around the following five points:

- Support the Commission in its systematic analysis of the ecosystems and the risks and needs of industry as it embarks on the twin – green and digital – transition and the strengthening of its resilience.
- For the most relevant ecosystems and together with other relevant stakeholders support the development of transition pathways.

- Support the analysis of strategic dependencies.
- Identify cross-border and cross-ecosystem investment needs and cooperation opportunities.
- Advanced Manufacturing

CECIMO plays an important role in Task Force 5 which is dedicated to supporting the uptake of advanced manufacturing processes.

Over the course of the next three years, CECIMO will actively support the work of the European Commission that recognises the vital role of advanced manufacturing technologies. These technologies will enable the emergence of new industrial products and business models, whilst supporting the twin transitions and promoting industrial resilience. In this context, we aim to develop recommendations that help speed up the uptake of advanced manufacturing technologies and processes by EU industry to increase its competitiveness.

Only a coordinated and ambitious strategy can ensure that European industry is at the forefront of technological developments and takes full advantage of the opportunity to strengthen its strategic autonomy and resilience.

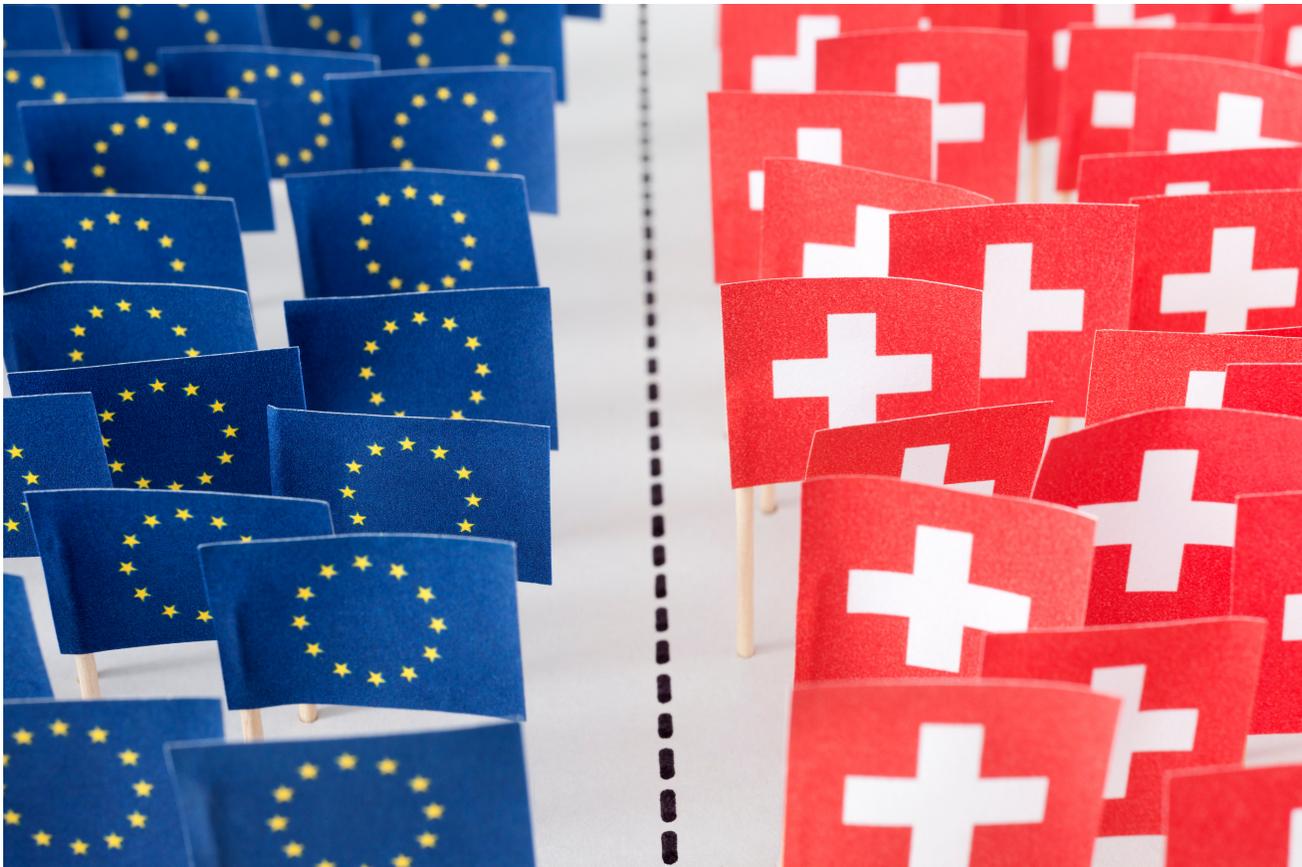


**“Collaboration is essential for the successful implementation of the Industrial Strategy and for turning its goals into practice. Through our engagement in the Forum, we contribute to creating favourable conditions for industry’s recovery. Thus we help to speed up the twin transition of industrial ecosystems using advanced manufacturing technologies and new business models that rely on digital manufacturing.”**

– Bruno Cathomen, Chairman of the CECIMO Communications & Advocacy Committee

# SWISS-EU RELATIONS: STALEMATE IS THE WORST OPTION

– by Stefan Brupbacher, Director, Swissmem



Switzerland is Europe's fourth-largest trading partner. Swiss manufacturers export over half of their products to EU countries annually. With 69% of imports to Switzerland, no other trading block is of higher importance than the EU. Swiss companies employ more people abroad than they do at home, making them a significant contributor to Europe's wealth with over 10% of all foreign direct investments. No question that the Swiss-EU relations are of vital importance to both, the EU members and Switzerland.

Today, 120 bilateral treaties guide free trade, Switzerland's participation in the Common Market, the free movement of people, the Swiss association to the Schengen area and many more aspects of their close cooperation. Over the last 20 years, the Swiss voted multiple times in favour of maintaining and deepening this partnership – a democratic approval like no other in the world.

However, an umbrella for these bilateral agreements in the form of an institutional framework is lacking. Swissmem, Switzerland's largest association for the manufacturing sector with over 1,400 member companies of all sizes, supported such an institutional framework from the very beginning, asking for stability, legal certainty and a perspective to conclude new agreements.

Regretfully, after the Swiss Government terminated year-long negotiations with the EU, there is currently a high risk of negative impact on the Swiss-EU relations, both politically and economically. Although the situation is not at all comparable to BREXIT, the EU stopped accepting Swiss certificates for medical devices, making it necessary for Swiss companies to apply for an EU certificate separately.

With the upcoming revision of the European Machinery Directive, Swiss manufacturers could be exposed to a similar hurdle, increasing uncertainty, supply chain disruptions and cost for Swiss companies and their trading partners in the EU.

On top, Switzerland used to be a key contributor to the EU's innovation schemes. Yet, the EU downgraded Switzerland to a third country in Horizon Europe. This does not take into account the power of Swiss research and development, both at universities and companies. A true lose-lose situation for everybody. Switzerland is ready to contribute with a full association to sustainability, progress and wealth in Europe.

It is thus of vital importance that a standstill in Swiss-EU relations is avoided. Not a single problem will be solved by going into a stalemate. While full membership is not an option for Switzerland, the manufacturing sector needs a solution for the uninterrupted access to the Common Market and a deepening of the relationships in other areas.

Therefore, the only feasible way forward is a fresh start for an institutional framework. This would also allow to address a different concern: For electricity security and grid stability, Switzerland needs to participate in the European electricity market. The EU made clear that such a participation is possible once a framework has been agreed.



Stefan Brupbacher

It is clear that Switzerland and the EU need to keep the door open for a new framework agreement. In due course, there is no other way than to get back at the negotiation table.



**“It is imperative to maintain strong economic relations between European and Swiss MT industries given the strong trade ties that bind the two. As such keeping the EU-Swiss future economic relationship is in all our businesses’ best interest and is of utmost importance for the manufacturing sector.”**

– Michael Hauser, CEO, Tornos

# MEET A CECIMO DELEGATE

## INTERVIEW WITH BARBARA COLOMBO, PRESIDENT OF UCIMU-SISTEMI PER PRODURRE

**In your opinion and from your experience until now, what are the main perks of being a CECIMO member?**

First of all, to be a member in the board of CECIMO allows a better understanding of the European scenario, which has become a crucial aspect especially in the last few years.

Secondly, it enables to have an open exchange of views with colleagues from other countries. Discussing with them is a useful enrichment, also because it is possible to be informed about the differences concerning the various countries of origin. These differences may concern the aspects linked to the structure of the sector, but also those related to regulations, legislation, tax reliefs and incentives provided for in each economic and production country system.

Finally, I think that the third relevant aspect regards the issue of direct participation. Being in the board of CECIMO is a way to take part in the definition of directions with regard to industrial policy, issuing of technical standards, communication, according to which the lobby and representative activity of CECIMO is then carried out in relation to the stakeholders, among whom the decision-making bodies of Brussels.

**Given that green and digital are at the forefront of policy discussions, do you think that the machine tools industry is heading in the right direction when it comes to these two important aspects? Do you think there is more to be done?**

With reference to the Italian industry of the sector, which I represent as president of UCIMU, I can say that we have made big strides forward. The digital transition of the Italian manufacturing industry is in progress, also by means of state-of-the-art machine tools, equipped with interconnection systems, sensors and more and more advanced automation.



**"The process of digital transformation, although it is more and more widespread, is not evenly distributed in the manufacturing industry."**

After all, more than 5 years ago, Italy has made available a plan of measures to support the transformation of factories. This has incentivised the manufacturers' activity, who are working on the development of ever-innovative solutions. On the other hand, with regard to the green issue, for many years the aspect of an appropriate management of resources has been a strategic element for the "Made in Italy" product offering of the sector, because it is one of the factors considered by customer enterprises, when requiring machines capable of ensuring efficient production processes.

This said, there are still ample margins for improvement, for at least two reasons: first of all, because innovation, which is essentially based on these two factors, is a continuous process; secondly, because innovation should then be accompanied with professional education and training.

### **What do you consider to be Ficep's most significant success in terms of innovation?**

In Ficep, the most significant innovation that we are facing during these years, is named "Industry 4.0", that is at the heart of our development strategy.

How did we face this change? We started from a deep understanding of a Steel Fabrication Factory (our customer) and of its productive process. The result was the creation of an Intelligent Steel Fabrication Software, a PLM (Product Lifecycle Management) that could manage production by looking at 3 basic issues:

1. What do I need to fabricate? 3D project;
2. What is the capability of my workshop? N° and type of machines and workflow;
3. Which is the best way to fabricate the project, knowing the workshop capabilities? With the information above PLM can automate or guide your production to be as efficient as possible.

PLM created a link between detailing technical office and the workshop in order to offer a digitalized management of the workflow and optimize production (with a clearly visible ROI and with cost savings).

3D projects are now easily imported into our software allowing recognition of assemblies and pieces, as well as all the operations (fabrication jobs) to be carried out on our CNC machines.

One single XML file (coming from the office) contains all data we need (such as geometrical information, assembly information, sequence information, nomenclature, 3D info of the assembly, scribing information, welding information, scheduling information and cost information) for fabrication management. Our post-processors drive machines by translating programs sent from the office (XML file).

These data helps to react in an intelligent way to optimize the industrial process, allowing planners and supervisors to understand how their processes are performing because they can easily see bottlenecks and inefficiencies which were previously hidden, adjusting workflow accordingly.

But "Industry 4.0" for Ficep went further. The availability of these data was used by Ficep to empower manufacturing automation at a higher level offering value to our customers with fully automatic steel fabrication "factories"; besides machines we now supply automatic robot for welding and surface treatments and automatic material handling.

Thanks to large investments on "Industry 4.0" Ficep is recognized worldwide as a supplier of turn- key advanced factories more than a machine tool company for structural steel fabrication. We supply automation, intelligent steel fabrication, mobile applications, software integration, production management and analysis.



**"To reach this goal Ficep exploited our most valuable assets: our knowledge, skills and creativity. People were the heart of this revolution"**

A new software department counting 45 electronic engineers was created to design, manage and maintain PLM, HMI (Human Manufacturing Interface) and CNC software.

For this purpose, at Ficep, a specific Academy was created for continuous training of Ficep staff and customers' personnel to gain wider knowledge of the overall process in steel fabrication. Training for CNC and PLM development, automation, processing technology theories, tests and predictive maintenance for a total amount of 5000 hours per year.

**Not every manufacturing company can adopt new digital solutions at the same pace. What we can do to accelerate the use of digital technologies, and which are the most urgent policies needed to maximize the benefits?**

It is true. The process of digital transformation, although it is more and more widespread, is not evenly distributed in the manufacturing industry. The ongoing transformation concerns enterprises that are already in an advanced stage of the process, whereas others are approaching the issue just now. With regard to the Italian situation, the small-sized companies are behind, because the digital transformation implies a cultural and vision change, for which a certain period of "acceptance" is needed. This is a cultural change. Therefore, the transition should be accompanied with incentive measures that should have a long time duration.

Besides the Government provisions conceived to incentivise and support this change, as the Italian Government is doing now, I think it is essential that, at least in an initial phase of the process, the enterprises may refer to experts, who can orient and suggest them the steps to be taken to activate their transformation, based on their characteristics and needs. In Italy, we have the Competence Centers – linked to important universities, such as, for example, the Politecnico di Milano (Polytechnic University of Milan), which can operate in this sense, by offering appropriate specialist consultancy to enterprises.

Finally, it is necessary to consider the aspect of updating skills and training of employees, which is crucial in this process: without it, the transformation made possible by the new acquired technologies and by the investment plans, also defined with the support of experts, risks remaining only on paper.

**Skills are central for mastering the digital and green transitions. What skillset will be required to adapt the workforce to the industrial transformation and what would you say to a young person to convince them to start a career in MT sector?**

Compared to a recent past, the required skills for the operators of the sector are much more multidisciplinary and include mechanics, mechatronics, electronics, but also IT and digital technologies related to the diffusion of the approach 4.0. In addition, soft skills are also required, consisting in an inclination to flexibility, teamwork and interaction with machines. These characteristics must be part of a candidate's background.

For those who operate in a sector having high technological content, such as that of machine tools and production systems, these skills are an essential condition to guarantee a company the maintenance of its competitiveness in the market where it is operating.

All this already proves the value of the work in the production plants of our sector, but, unfortunately, this is not always clear for those who do not operate directly in our world. In order to encourage the approach of young people to this sector, it is necessary to create culture: to show what means working in a factory of the sector and the value of this manufacturing industry. It is not a simple and immediate process. It takes a long time, but I am sure that, with the commitment of all of us – enterprises, families, schools, university world and alternative education and training institutes, such as the ITS (Higher Technical Institutes) – we will be able to achieve this goal, also because the related employment opportunities and career paths are extremely interesting.

# TECHNOLOGY INDUSTRIES OF FINLAND - AN INTERVIEW WITH REETA LUOMANPÄÄ



## Technology Industries of Finland

### What is the mission and vision of Technology Industries of Finland? What about its core values?

Technology Industries of Finland is aiming to build our technology companies premises to succeed and create sustainable value. Our mission is the long-term success of Finland and that guides everything we do. Our vision is that in 2030, Finland is a competitive, digitally and environmentally advanced, successful country. In Technology Industries of Finland we have four core values which are: We proceed bravely in time; We co-operate together valuing each other; We are curious experts ;and We influence openly and responsibly

### Could you tell us more about your entrepreneurship programme?

In Technology Industries of Finland, we have growth programs especially for small and medium-sized companies to support growth and business development. These programs normally last for a year and are based on a general subject common for all the companies participating and the companies will bring their own project to be developed during the program. These programs offer support and enthusiastic peer guidance to help the companies to reach their goals in growth and in internationalization. This year the three main focus areas have been digital manufacturing company, which helps the companies to improve their operative completeness and efficiency by digital solutions; Digi-green business, which helps the companies to develop new business utilizing digitality, data and circular economy; and modern sales and marketing, which helps the companies to modernize their sales and marketing using customer oriented approach and digitalization. Next years programs are yet to be decided.



### A big focus for our industry at the moment is sustainability and decarbonisation. What actions did Technology Industries of Finland take over the last few years to tackle this issue? What future plans do you have in this sense?

The efficiency and low emissions of the Finnish technology industry are of global environmental value, as Finland is a world leader in the design, production and use of low-emissions technology. Finnish technology companies are among the frontrunners in the development of sustainable practices, operating methods, devices and services. These involve everyday climate actions as a part of the lifecycle mindset for products and services. The circular economy and energy efficiency have been the competitive strengths of Finnish technology companies for decades and that will be aim for the future as well. Technology Industries of Finland is committed to the Finnish government's target of achieving a carbon-neutral Finland in 2035. Our low-carbon roadmap examines the technologies and actions required in the technology industry and offers companies the tools to reach this target.

The most significant means of reducing the industry's direct emissions are to electrify processes, machinery and equipment and to deploy new process concepts, such as bio or hydrogen reduction and carbon capture and recovery as well as replacing fossil coke in blast furnace and ferrochromium processes with biomass-based carbons, introducing direct reduction using hydrogen, and using electric arc furnaces. These solutions can be used to make metal processing practically emission-free.

**In terms of digitisation of the sector, do you think companies in Finland are ready for the next set of innovations in this field? What do you think are the risks and benefits of technologies like AI for the sector?**

Not only is digitalization a global megatrend, but the growth potential of the Finnish economy and Finnish technology companies is also connected to digitalization. We can tackle many of the biggest social changes – climate change, the aging population, globalization – when we utilize ICT more effectively.

The technology industry is experiencing a revolution in traditional manufacturing. In addition to automation and robotics, also other things like Internet of Things and AI are becoming more and more important for example in machine tool industry.



**I have total faith in Finnish technology companies being able to transform and develop concerning digitalization over the next few years since they have proved already to be very agile and willing to adapt to different circumstances.**

This is also vital in order to be competitive in the global market. I think the biggest benefits of new technologies like AI and internet of things, is that many simple, dull, physically demanding jobs will be consigned to history.

Nevertheless, digitalization will not mean an increase in unemployment, as according to the latest forecasts digitalization will create new jobs requiring new skills and companies can be more productive and profitable. I think the biggest risks concerning these new technologies, are lack of sufficient and suitable standardization if it cannot keep up with the fast development and also careful consideration of cyber security is naturally very important in today's world. Other risk might be reluctance of the manufacturing employees to learn and adapt new technologies to their everyday work.



# EMO IN A NUTSHELL

## EMO MILANO 2021: A GREAT SUCCESS!



EMO MILANO 2021, the world trade show dedicated to the metalworking sector held at the Exhibition Centre of fieramilano Rho from 4 to 9 October 2021 was a great success.

Promoted by CECIMO, the European Association of Machine Tool Industries, and organised by the operational structures of UCIMU-SISTEMI PER PRODURRE, the Italian machine tools, robots and automation systems Manufacturers' Association, EMO MILANO 2021 presented the product proposal of over 700 exhibiting enterprises, among which 60% are foreign companies, on an overall exhibition area of 110,000 sq. m. Six halls housed the event that registered more than 60,000 visitors coming from 91 countries.

Despite the mobility restrictions still in force, EMO MILANO confirmed its international character even on this occasion. Foreign exhibitors accounted for 60% of the total, whereas foreign visitors made up 30% of the overall number.

Besides registering the users' interest, EMO MILANO 2021 attracted the attention of the international press: about 400 accredited journalists, of whom 40% were from abroad.

Luigi Galdabini, General Commissioner of EMO MILANO 2021, stated: "The exhibition data confirm the value of the event, considered as the appointment of reference for the worldwide manufacturing industry of machine tools, robots and automation systems".

"In such a complicated, historic moment, where the public health emergency is not yet completely over – continued Luigi Galdabini – EMO showed its importance, drawing all those operators to Milan, who could have the green light to move from their countries of origin. Moreover, the participation of the operators, coming not only from Europe, also proves the attractiveness of Italy, regarded as one of the most interesting and promising markets, as well as a leading manufacturing country in the sector".

Alfredo Mariotti, Director of the Exhibition, pointed out: "A very large number of exhibitors have expressed their full satisfaction with the results achieved over these six exhibition days. "Qualified and very motivated visitors", "A duly organised trade show in all its details and not least those related to safety".

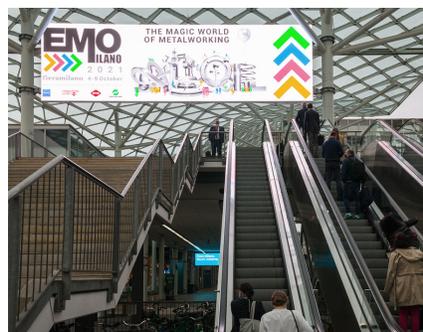
These are the most common expressions of appreciation received both from habitual exhibitors of the world metalworking trade show and from companies who did not have particular, previous participation experiences”.



**“The work carried out by the EMO team has been appreciated by Italian and foreign operators, who also expressed their satisfaction on social media, thus supporting the climate of trust that characterises the sector and regarded EMO MILANO 2021 as the event launching the post-pandemic era”.**

Beside the technology offering, EMO MILANO 2021 featured numerous side initiatives, such as EMO Digital, the exhibition area focused on digital technologies; EMO Additive Manufacturing, dedicated to one of the most promising fields of the manufacturing production; EMO Start-Up, which offered an overlook of new enterprises working on the development of products and projects related to the world of production systems and metalworking.

A novelty of EMO MILANO 2021 was the Speakers Corner, the arena set up in Hall 5, which proposed over 80 speeches and in-depth analyses and discussions by exhibitors and organisers. In addition, 20 meetings were hosted within the EMO ADDITIVE area, arranged by AITA-ITALIAN ASSOCIATION OF ADDITIVE TECHNOLOGIES. Over 2,000 attendees registered for the meetings, in addition to about 3,000 remotely connected users (for an average of 500 users per day), who, over the six exhibition days, were able to follow the events held at the trade show thanks to the live streaming service. The next edition of EMO MILANO will take place in October 2027.



# RELAUNCH FOR EMO HANNOVER

## WORLD TRADE FAIR FOR PRODUCTION TECHNOLOGY TO FOCUS ON THE FUTURE OF INDUSTRIAL PRODUCTION

– by Dr. Wilfried Schäfer, Executive Director of VDW (German Machine Tool Builders' Association)

"Hello, new EMO Hannover" was the salutation at the launch of the new EMO concept in mid-September. The VDW has been working intensively on developing this concept in cooperation with international exhibitors and with the support of a Frankfurt PR agency over the last few months. This had become necessary to allow the EMO Hannover to consolidate its position as the world's leading trade show, to pick up on and throw light on the changes in the industry, and to explore new topics and target groups, we felt.

So what's new? EMO Hannover has repositioned itself as the world's leading trade fair for production technology. This represents a broadening of the event's focus. It now addresses technical innovations across the entire value chain as well as the environment in which the industry operates. The new claim – "Innovate Manufacturing." – underlines this. It also acts as an incentive because it addresses the major challenges which industry will have to overcome in the transformation process over the coming months and years. And it encourages all EMO participants, exhibitors and visitors to engage in an ongoing process of reinvention by improving and expanding their offerings, streamlining their processes and tapping into new markets in order to give themselves the best possible advantage over the international competition. At the same time, it sets up the EMO Hannover as an innovation platform for production technology that is also developing into a major international business platform – and not only during the trade show itself. Aimed at innovating and optimizing industrial production, it showcases the full breadth and depth of technology.



"Innovate Manufacturing." is about more than just technology, however. In the future, EMO Hannover also wants to address topics that are relevant to production technology and its client industries all over the world. An intensive discussion is already underway among the business community and in society in general regarding the Future Insights of EMO Hannover 2023: The Future of Connectivity, The Future of Sustainability in Production and The Future of Business with Work 4.0. In our view, these are some – but by no means all – of the major issues that industry and society will have to resolve in the coming years in order to remain fit for the future and to be able to rise to the urgent tasks ahead, such as the energy transition, climate change, sustainable production, new competitors, transformation of key customer industries, digitalization, changes in the world of work, new data-driven business models, and many more. None of these stands in isolation. Rather they intermesh and cross-fertilize, and must be worked on and resolved in tandem if they are to be addressed effectively. The classic aspects of production technology – quality, efficiency, flexibility, reliability – will not, however, be neglected. They continue to set the pace of development.

EMO Hannover also highlights the importance of dialog. Not all challenges will have been met by 2023 by any means, but by coming to Hannover to show their customers their achievements, exhibitors will certainly be moving in the right direction.

## EMO HANNOVER AS THE NUMBER ONE INDUSTRY HUB ALL YEAR ROUND – FACE-TO-FACE AND DIGITAL

Dialog and encounters are two of the important elements of the new EMO Hannover. As I set out at the beginning, this is evident at many points in the new EMO structure and is also reflected in the clearly defined communication concept. It is based on the following pillars: EMO Communication, EMO Connect, EMO Digital and EMO Conference. There are also new formats such as Speakers Corner, Master Classes and EMO Academy, but also familiar offerings such as matchmaking and guided highlight tours – including digital versions. These will reflect the Future Insights of EMO Hannover, as will many other topics suggested by the activities of the exhibitors and by recent research and development work.

Another aim of the new EMO Hannover is to establish itself as the most important meeting place for the industry – not only during the trade show itself, but also between the events, with a digital accompanying program that operates 365 days a year. We will be developing and shaping these formats together with our partners in time for the fair. These include EMO World Tour events in early 2023 which will address the above topics and describe the challenges they present in the individual regions of the world – and showcase potential production technology solutions for them.

In a nutshell: EMO has been the world's leading trade show for metalworking since 1975. But today it is even more. It covers the entire value chain and now integrates all necessary aspects of IT as we advance towards the smart factory of the future which requires ever more comprehensive levels of networking. In the future, digital twins will be firmly integrated into EMO Hannover. The event is also much more than a just sales platform.



We engage in dialog with our customers, exhibitors and target groups, bringing them together in networks. We pool knowledge and provide reliable information for investors. And we now cordially invite all exhibitors at EMO Hannover to join us on this path.

# JOINED CECIMO IN 2021

## Secretariat



**Stefano Ramundo Orlando**  
*Technical Regulations Officer*



**Anto Jerkovic**  
*EU Public Affairs Economist*



**Diana Anichitoaei**  
*Communication and Events Officer*



**Selena Goksel**  
*Office Manager*



**Gabriele Favaro**  
*EU Policy Officer/ Project Coordinator*

## Delegates



**Adolf Kerbl**  
*Managing Director,  
Metaltechnology Austria*



**Mauro Biglia**  
*Commercial and Sales Manager,  
Officine E. Biglia*



**Viktor Backman**  
*CEO, SMT Group, Swedish  
Machine Tool Company AB*

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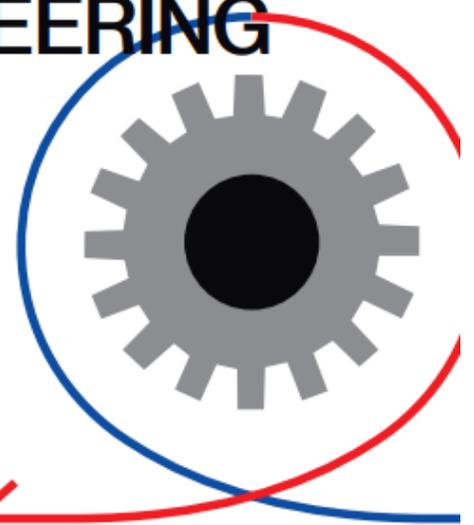
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# cecimo

European Association of the Machine Tool Industries  
and related Manufacturing Technologies

## OUR MEMBER ASSOCIATIONS

Austria: FMTI, Association of Metaltechnology Industries  
[www.metalltechnischeindustrie.at](http://www.metalltechnischeindustrie.at)

Belgium: AGORIA, Federatie 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: Danish Manufacturing Industries Cooperation  
A part of the Confederation of Danish Industry  
[www.isa.di.dk](http://www.isa.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  
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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)

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