REGIONAL FORUM & MANUFACTURING

14h30 - 16h30 Roundtable Discussion
Tuesday 4 June 2019

Representation of the State of Baden-Württemberg to the EU
Rue Belliard 60 - 62
1040 Brussels

WELCOME & INTRODUCTION

Bodo LEHMANN, Director of the Representation of the State of Baden-Württemberg to the EU

I would like to welcome all participants and speakers present, and thank the European Forum for Manufacturing for the joint organisation of today's event. Like everybody else in Brussels, we are closely following the reconstitution of the EU institutions and replacement of senior positions after the recent elections. We are expecting the new Commission to be in place by November 1st. By the time the new Commission takes office, we as regional representatives need to be able to formulate our expectations for the coming legislature, especially concerning industrial policy.

This event is designed to promote cooperation and exchange between regions across the EU, on the topic of industrial policy with respect to technological transformations, particularly in the field of Artificial Intelligence (AI). This is a good opportunity to discuss issues around industrial policy, mainly with respect to technological change, so that we as regions can take a coherent vision for the future of EU industrial policy to the newly formed Commission.

Fabian JÄGERHUBER, State of Baden-Württemberg Representation to the EU,
Policy Officer of the Ministry of Economic Affairs, introduced the first themes and speakers as he took over the Chairing.

ARTIFICIAL INTELLIGENCE & MANUFACTURING

Keynote speech: Petra PÜCHNER, Baden-Württemberg Commissioner for Europe, Minister of Economic Affairs, Labour and Housing

Artificial Intelligence (AI)

The potential of AI can be found along the full value chains in manufacturing in Europe. Fast scaling of innovative projects by joining forces among regions in the EU is necessary to stay at the forefront of intelligent future-proof manufacturing. The innovative regions in Europe have that potential by joining their strengths to create:

1. European Ecosystems where research and industry work hand in hand: connecting excellence in research with industry, SME and innovators to increase the momentum in topics like machine learning by creating data hubs and platform, so that the data economy in manufacturing can scale

2. Infrastructures for HPC & Data storage facilities: to scale machine learning and the data economy more investment efforts are necessary in Europe to enable the data economy in the whole existing & new value chains in manufacturing

3. An attractive Europe for talents and Innovators: Europe needs to showcase, that we are not only willing but also capable to be a place, where innovators can develop their ideas, find strategic partners in industry and the necessary investments to scale

4. Being in the forefront of standards in cybersecurity, data protection & ethics of AI: Europe has the potential to show that AI can respect and support our ethical values, hence using it as competitive strength in global markets

5. Making use of all available means at regional, national and European scale to ensure fast scaling of AI in manufacturing.

The regions in Europe, especially those strong in manufacturing, are the drivers for the necessary transformation of manufacturing, by connecting our strengths in manufacturing with our competences in cyber physical systems, connecting it with a new European way for the data economy.

Baden-Württemberg's (BW) approach to AI

Baden-Württemberg is one of the most innovative regions in Europe, which is reflected in its innovation index score of 69.5 (nearly twice the EU average). Around 5% of GDP was spent on Research & Development in 2016.

Baden-Württemberg is determined to remain a leader in innovation, and it is the state government's stated goal to strengthen industrial policy with respect to innovation. This includes a special focus on Artificial Intelligence.

Its approach to AI is a combination of applied research and transfer with a focus on SMEs and wide-spread application throughout the entire region of BW.

Industry 4.0 and Digi Hubs play an important role for making digitalisation and region-wide application a priority and reality. This reflected in a host of different projects including Regional Digital Hubs, in which a network of partners from research institutions and the private sector closely integrate in various industries and fields of technology.

They include:
• regionale Digital Hubs in Baden-Württemberg *(https://www.wirtschaft-digital-bw.de/massnahmen/foerderung-digital-hubs/)*

• 100 spaces (100 Orte) for i4.0 *(https://www.i40-bw.de/de/100-orte-wettbewerb/)* with more than

half concerning SMEs

- Hybrid models to combine company data/machine learning and human intelligence

Other examples in Baden-Württemberg:
Allianz Industrie 4.0 BW *(https://www.i40-bw.de/de/)*, Cybervalley, Regional KI labs, Innovationsgutschein High-tech digital *(https://www.wirtschaft-digital-bw.de/massnahmen/innovationsgutschein-hightech-digital/)* Cyber Protect KI

- ActiveCockpit – Interaktive Kommunikationsplattform für die Fertigungsindustrie (Interactive Communication Platform for Manufacturing Industry) (Robert Bosch GmbH) *(https://www.i40-bw.de/de/100orte/robert-bosch-gmbh/)*

- Applikationszentrum Industrie 4.0 (Industrial Applications Centre 4.0) *(https://www.i40-bw.de/de/100orte/applikationszentrum-industrie-4-0-fraunhofer-ipa/)* Innovationsumgebung zur industriegetriebenen Erforschung, gemeinsamen Entwicklung und aussagekräftigen Demonstration cyberphysischer Systeme im Produktionsumfeld (Innovation environment for industrial geared research, common development and sound evidence based demonstration of cyber-physics systems in the production environment)

- Die digital vernetzte Blechfertigung (TRUMPF Werkzeugmaschinen GmbH + Co. KG) (Digitally networked sheet metal manufacturing) *(https://www.i40-bw.de/de/100orte/trumpf-werkzeugmaschinen-gmbh-und-co-kg/)*

- Fertigungssimulation und - validierung (Manufacturing simulation and validation) Siemens AG Manufacturing Karlsruhe *(https://www.i40-bw.de/de/100orte/siemens-manufacturing-karlsruhe/)*

- Another pioneering project in the field of AI is the so-called Cyber Valley in Stuttgart-Tübingen, in which international key players from science and industry concentrate their research activities in the fields of machine learning and robotics. When it comes to machine learning technology, Cyber Valley ranks among the top 10 research locations worldwide.

The state of Baden-Württemberg is making a comprehensive effort to connect SMEs to these research clusters.

In order for Europe to remain at the forefront of intelligent, future-proof manufacturing, different regions must join resources and capabilities in order to create an ecosystem in which new business models can scale. In this context, it is imperative to share information by creating data hubs and platforms so that the data economy in manufacturing can scale. Moreover, a more connected infrastructure across different regions is necessary to scale machine learning and the data economy.

Furthermore, Europe needs more investment efforts to fully exploit the potential of existing and emerging value chains in manufacturing.

AI and other new technologies also create spill-over effects into other working areas of the EU. Europe needs to be a leader in setting new standards in cybersecurity, data protection, and questions of ethics surrounding AI. This is necessary to create an environment in which SMEs can safely share information and data.

The subject 'lifelong learning' also has to feature prominently on the EU-agenda, so that the skills of the workforce match the requirements of a digitally transformed labour market.

Requests from BW for:
• Unbureaucratic and simple support to SMEs
• R&D guideline
• State aid regulation revision
• Standardisation key for EU progress: Common standard –> UPCOA and
• EU law to provide safe spaces with security for companies

Report on the Current & Planned Use of AI by 7 Manufacturers in Europe

Cornelia KUTTERER, Microsoft, Senior Director EU Government Affairs, AI & Privacy and Digital Policies

Manufacturing - Current & Planned Use of AI in Europe

As one of the first industries transformed by the Industrial Revolution in the 18th century, manufacturing has already established itself as a pioneer in the Fourth Industrial Revolution in this century. Research suggests that AI could double annual economic growth rates in mature economies by changing the nature of work and creating a new relationship between humans and machines. In Germany alone, one government-sponsored study predicts that between 2018–2023, AI will add €32 billion to the country's manufacturing output: This equates to about one-third of the entire growth expected in this sector over the same period.

The future of manufacturing and manufacturers' ability to improve key areas, such as worker safety and sustainability are directly dependent on AI and technology. Microsoft has long been a technology partner in manufacturing, and as AI systems are only as good as the data from which they learn, Microsoft works with customers to create AI solutions that will help harness their data and create better insights for their organizations. These consumers therefore will be able to create products and services that use AI to better understand, anticipate, and respond to people's needs.

Working with customers in manufacturing, we discovered six key themes:

1. Manufacturers are already seizing and, in some cases, leading the industrial AI opportunity. Manufacturing is again leading the way in embracing new tech, using AI to optimize processes and deliver new products.

2. Central to digital transformation is cultural transformation. To realize the value of AI, the entire organization must work to create a seamless information supply chain inside companies.

3. Those closest to the workforce are the most sensitive and attentive to AI's impact on it. Their focus is to create a better company and more opportunity.

4. But there will be disruption and dislocation. Jobs in manufacturing will require new skills, and short- term disruption must be addressed. We need a new partnership for workforce development with technology providers, industry, government, learning institutions, and labour organizations.

5. Next-generation policies and laws are needed for next generation technologies. New rules and new laws are needed to build trust in technology and guide responsible innovation.

6. AI is a journey, different for everyone. While many of our leading customers have embraced AI, there are many who are just beginning their journey. Microsoft has developed a guide to help them on their AI journey and show them how to best leverage their data estate.

In the recently published book "The Future Computed: AI and Manufacturing" *(https://news.microsoft.com/futurecomputed/)* Microsoft heard the story of different manufacturers that embrace the AI journey. While these stories show what realizing tech intensity is all about, they also remind us that people are at the heart of this transformation. Microsoft heard its customers to describe that journey, including their views that this technology has profound implications for their business models, their workforce, and their responsibilities as ethical organizations.

Below is a brief summary of the AI journey of 7 manufacturers that are harnessing AI to carve out competitive advantage.

Thyssenkrupp
For Thyssenkrupp digital transformation means data is available to everyone all the time, in real time, anytime, and on any device for the purpose of empowering people and business.

Thyssenkrupp's Max - Maximum Uptime, All the Time - is the elevator industry's first real-time, cloud- based, predictive maintenance solution. It was the company's initial success and since then Thyssenkrupp has taken this cultural transformation to help other customers. For instance, one auto manufacturing customer of theirs was struggling with one specific operation on the assembly line - sealing a door. It was a costly, time-laden job, but it was also a job that AI could help improve. Thyssenkrupp realized the customer was not scaling data beyond a single factory to get bigger impact across the company. Stakeholders shared data to build a digital twin - a virtual assembly line - to come up with a better solution. They now have a brand-new processing system that takes not just one piece of data, but all the data necessary to design a new system.

ABB
ABB pioneered the modern robotics revolution in 1974 with the first microprocessor-controlled industrial robot. Today, the company is focused on innovation, with particular emphasis on AI for industrial applications. ABB's automated control systems react to planned events and help people be more efficient and productive.

ABB is working on autonomous systems for a variety of industries and with AI, can better predict when a machine, robot, or system is at risk of malfunction. For human operators, knowing when

to intervene pre-emptively avoids costly downtime and unpleasant surprises. With sensors, data, and machine learning algorithms, ABB can not only predict with 95% accuracy when a turbine is likely to fail, but can also provide prescriptive information on remaining useful life under different operating conditions. Armed with this information, an operator can schedule pre-emptive maintenance at the most opportune moment. With AI to augment human capabilities, ABB can make its industry safer, cleaner, and more productive than ever before to benefit everyone.

MTorres
Throughout its progress, MTorres began to realize that not only did it have a competitive advantage due to its experience and skills, it also had a comparative advantage because of its data. That data coupled with an algorithm and compute power - a combination central to advanced machine learning and AI - is leading MTorres to breakthroughs never before imagined.

The ability to flawlessly laminate carbon fibre onto an airplane wing at 60 meters per minute means not only greater efficiency and productivity but also greater accuracy and fewer mistakes. With AI, the company can also inspect its work in real time. MTorres now is using advanced machine learning and AI in its Automatic Fibre Placement machines to optimize for scrap reduction.

Tetra Pak
To prevent disruptions across the food industry, Tetra Pak is employing new, digital tools that enable its cloud-connected machines to predict exactly when equipment needs maintenance, averting many breakdowns. When repairs are needed, Tetra Pak service engineers use HoloLens headsets to more quickly diagnose and fix machine issues, even in the most remote locations. To further streamline machine diagnostics and repair for costumers, Tetra Pak is outfitting service engineers with hundreds of HoloLens devices, Microsoft's mixed reality technology.

In short, Tetra Pak can now foresee machine problems - or quickly spot breakdowns - reducing plant downtimes and the high costs they carry. Lastly, by connecting packaging lines to the Microsoft Azure Cloud, Tetra Pak can collect operational data to help predict informed maintenance timing. The company has placed sensors on some carton-filling equipment, allowing global experts to analyse, in real time, data patterns.

ZF Group
Auto parts giant ZF Group is pioneering data algorithms and technology to make their production line more reliable and sustainable. In other words, detecting and predicting mechanical failures on the manufacturing line and conserving energy. Working with Microsoft, ZF Group trained a model to diagnose a potential problem and, over time, by using more and more sensor and maintenance data, they improved the model and eventually were able to better predict the expensive tool failures.

Likewise, they have trained their data models to examine energy consumption. The company pays a premium for power when it surpasses a certain level. In the past ZF had to fly blind, but today the company uses an intelligent assistant based on reinforcement learning to better predict energy consumption. Workers are already embracing the idea that having algorithms with them when they need them is important. ZF's "XReality" is a combination of augmented and mixed reality in which wearable devices like Microsoft's HoloLens can help workers identify machines and parts,

access data, and help a worker or floor supervisor solve a problem. ZF is helping to make workers more autonomous even as they help car manufacturers build their autonomous and electric vehicles of the future.

Schneider Electric
Schneider Electric's platform is leveraging Microsoft AI to help a range of customers stay ahead of maintenance problems in applications as varied as coffee roasters in the developed world to schools and clinics in the developing world. One example is their use of Microsoft's Cortana Intelligence Suite in Nigeria, where Schneider can identify trends in its solar panels so technicians can address issues before they lead to outages. Historical data might show that a certain drop in electricity generated by a solar panel may indicate that a panel needs to be cleaned or a battery checked within 12 hours or it could fail. The analytics allow remote monitors to help proactively ward off those types of problems.

Repsol
Repsol, one of the world's largest oil and gas exploration and production companies, is using AI to fuel the world's energy demands while also protecting the environment. Data and computing make it possible to see beneath layers of soil, sequence DNA, and therefore make drilling more precise; minimizing not just the number of wells needing to be drilled, but maximizing the time to drill them. All of this helps reduce the time from acquisition of the site to when the energy is commercialized.

But what does Microsoft take from these themes and how do we move forward with these insights?

First, it is becoming increasingly clear that society needs a long-term and multi-stakeholder approach to realize industry transformation potential through AI. The need for our customers to engage in the development of the digital policy agenda is more important than ever.

Second, we need to prepare for the impact on the workforce and build a supply chain of talent to help new workers coming into the workforce acquire the new skills they will need, develop workers who will have to transition to new jobs with the same employer, and support those whose roles will be eliminated and will need new jobs elsewhere in the economy.

Finally, what this really means is we must keep engaging. We are all going to need to spend more time talking with, listening to, and learning from each other. We continue to look forward to working with people in all walks of life and every sector for building a foundation for AI that transforms not just businesses but transforms lives.

INNOVATION POLICY & INVESTMENT FOR GROWTH

Mark NICKLAS, Head of Unit Innovation Policy & Investment for Growth, European Commission

- The European Council has requested vision for the EU's industrial future by the end of 2019. Main building blocks are there, as outlined

in the EU Industrial Policy Strategy of 2017 and the various Council Conclusions on industrial policy.

- Main drivers of change are the trend to a data-driven economy, fuelled by digitalisation and artificial intelligence, and the transition to a climate-neutral economy respecting the planetary boundaries.

- European Commission has delivered all actions from the 2017 EU Industrial Policy Strategy, but adoption and implementation are still needed. In particular, the Single Market and next long-term EU budget are still work in progress. Uptake of innovative technologies by SMEs is crucial to increase productivity and spread the benefits across Europe. There is a strong regional dimension of EU industrial policy.

- What is needed is joining forces and pooling resources. In this context, the Commission has launched two major initiatives to facilitate pooling of resources.

- The Smart Specialisation Platform on Industrial Modernisation has facilitated more than 20 thematic inter-regional partnerships involving about 80 European regions in a bottom-up process.

- For the next Multi-Annual Financial Framework, the Commission has proposed a dedicated Interregional Innovation Investment instrument and counts on the support from regions to get this adopted with an appropriate budget to finance interregional innovation projects with a potential for the development of European value chains.

- In parallel, the Commission has established a Strategic Forum with Member States and industry representatives to facilitate joint action for key strategic value chains: connected, clean and automated vehicles; low-carbon industry; smart health; hydrogen technologies and systems; industrial Internet of Things; cybersecurity - following the example of the European Batteries Alliance and a first Important Project of Common European Interest in the area of microelectronics.

- Interregional partnerships can contribute to strengthening such strategic value chains.

ROUNDTABLE ON REGIONAL INITIATIVES

A. ERRIN - European Region Research & Innovation Network

Hortense LUTZ-HERMELLIN, Head of Auvergne-Rhône-Alpe's Office in Brussels & Vice-Chair of ERRIN network

Started in 2001 as an informal network, ERRIN is now a well-established Brussels- based platform of more than 125 regional stakeholder organisations from 22 European countries, most of whom are represented by their Brussels offices. Members are mainly regional authorities, universities, research organisations, chambers of commerce and clusters. They drive the agenda and the priorities of the whole network by taking an active role within 13 Working Groups or in the Management Board.

Our mission:
- We bring a place-based perspective to EU Research and Innovation policy and programmes

- We make connections and facilitate EU engagement between member regions, EU institutions and other partners

- Partnership building is also crucial for increasing project opportunities for members through networking opportunities, sharing project ideas, and personal contacts

- We position regional interests in the European Research and Innovation landscape. Bridging between Brussels (work closely with the Regional Offices located in BXL) and the different actors in the regions working on research and innovation.

Our Contribution to the Debate on Innovation Policy and Investment for Growth in the Regions

ERRIN's focus is on research and innovation policies and funding program, with an objective to work closely with our members to provide concrete input based on experience and expertise, and to create a long-term policy dialogue with EU institutions and services.

Our position on innovation is to promote a collaborative approach based on quadruple helix but also on regional ecosystems. Place-based regional innovation ecosystems could help to better co-ordinate research and innovation policies, practices and funding (Horizon Europe, but also cohesion policy) , at all governance levels and allowing more impact for RDI at local and regional levels, especially on key societal challenges.

Examples of Thematic Focus covered by ERRIN's Network through Working Groups, EU Funded Projects and Policy Dialogues:

- Regional Innovation Eco-Systems

How to connect regional innovation ecosystems and promote interregional cooperation?

- Tapping into the funding opportunities in next programming period (Horizon Europe/ Societal challenges and the new European Innovation Ecosystem action & Cohesion policy/ interregional innovation investment)?

- Role of local and regional actors in the governance of HoE including on missions? (cf. contribution to strategic planning consultation + R&I Days).

- What kind of complementarities and synergies between funding programs (HoE, Cohesion, Digital Europe, Invest EU)?

  - May 2019: Common statement on Interregional Innovation Investments for European value chains together with ERRIN - Vanguard Initiative - EARTO - Eurotech Universities - AER - CPMR - European Network of Living Labs . Key elements to maintain in this component (€970 million in the EU Multiannual Financial Framework 2021-2027): interregional nature, budget, central management and openness to third countries

  - Contribution to the definition of Action Plan for European Strategic Value Chains (ex AURA: "smart health", "mobility", "batteries" together with enterprises and academics)

- The Future of Smart Specialisation

Smart Specialisation 2.0 in next programming period

Participation to S3 platform (180 regions involved, ERRIN members): examples of S3 platform on industrial modernisation (for AURA: Medtech, Hydrogen Valleys etc.) with the objective to define interregional common investments on a specific value chain. Our members are very active in PS3 Platforms and are making strong links with ERRIN activities. - Challenge-driven innovation and co-creation

- Challenge-Driven Innovation and Co-creation

Challenge-driven innovation and co-creation: end user needs, participation of citizen / missions in HoE/ procurement of innovation - Digital Innovation Hubs (ex. MinaSmart AURA)

This topic could also be linked to the new European Innovation Ecosystem action in Horizon Europe, eg. through connecting innovation procurement initiatives, networking of innovation and technology infrastructures.

B. VANGUARD INITIATIVE [V-I]

Petra PÜCHNER, Board Member Vanguard Initiative, Baden-Württemberg Commissioner for Europe, Minister of Economic Affairs, Labour and Housing

- The Vanguard Initiative is a pioneering project for regional initiatives, a network of 35 regions that want boost new growth through bottom-up entrepreneurial innovation and industrial renewal in European priority areas.

- Based on the principles of 'smart specialisation' and their strategies to do so, regions collaborate in a variety of areas using their individual strengths and advantages combining leadership and strong partnerships.

- Through entrepreneurship and common goals VI can stimulate industry growth.

- Within the framework of Vanguard, regions can take advantage of their proximity and collaborate in a range of ways, including through shared infrastructure, to build eco-systems that can act as catalysts for fast growing innovative SMEs.

- By doing so regional innovation ecosystems can help to develop solutions for significant societal challenges while delivering on the EU's ambitions for improved international competitiveness, especially for industry and manufacturing made in Europe, facing global competition.

- In this context, the Vanguard initiative has achieved normative change in how interregional cooperation is approached.

- BW supports that strongly and has been since January 2019 part of the Board of the Vanguard Initiative; based on our strong manufacturing experience and companies we try to bring those assets to the European table.

- Innovation is one of the key foundations to boost SME industrial competitiveness.

EU Single Market as an innovation area

- The EU single market is a success story for goods and services, people and capital and has significantly help Europe to boost its industrial and manufacturing competitiveness globall.

- However, especially SMEs and start-ups are increasingly looking for opportunities and paths to grow outside the EU to access capital and larger markets at once, as the EU single market is still too fragmented, when it comes to promoting EU innovation by commercialising products and services in Europe.

- Hence, we need to understand and perceive the single market also more as an innovation area, so that EU companies don't go to Asia or the US to bring their new products on the market

- BW is keen to support EU, national and regional efforts to see an EU single market as an innovation area in real practice, incl. when it comes to innovation in manufacturing.

Vincenzo RENDA, Policy Officer CECIMO, European Association of the Machine Tool Industry and Related Manufacturing Technologies Innovation

Introduction

CECIMO is the European association representing the machine tool industries and related manufacturing technologies. Machine tool builders provide other manufacturing sectors with innovative, customized and sustainable solutions. Grouping together 15 national member associations all over Europe, CECIMO generates €26 billion of machine tool production and is an export champion as well. Almost every second machine tool exported in the world originates from Europe.

Vanguard is a notable example of European initiatives where regions can play a role together in accelerating the industrialization of emerging technologies. The expertise on industrial issues that a great variety of local authorities all over our continent have is in fully display in Vanguard. Nowhere this cooperation among regions is more beneficial than in 3D-Printing. Indeed, high-performance production through 3D-Printing is one of the pilot projects in Vanguard.

What is the added value of addressing 3D-Printing in Vanguard?

In this technology, otherwise known as additive manufacturing, Europe is internationally regarded

as a real leading player. CECIMO is glad to be the association representing the European additive manufacturing industry.

The benefits of this technology for the competitiveness of industry and the sustainability of our economy are vast. With the right policies and funding, a recent study concluded that additive manufacturing can potentially decrease energy demand by much as 27% by 2050. We really need to consider it as an important element in the toolbox to upgrade the European manufacturing sector. Certainly, many regions in our continent have built extensive capabilities and specialized on specific aspects of the technology. But reports have also showed that, until recent times, fragmentation has been one of the main gaps in the European additive manufacturing value chain. This has meant that many opportunities in terms of technology industrialization have remained unexploited. It became clear that a better connection among the different actors in the value chain, which is distributed across European countries and regions, was much-needed to guarantee the technology reach as many producers as possible, in particular SMEs.

Vanguard is doing precisely that, by advancing demonstration projects on issues that are critical for the industry. Just as an example, today in the sector there is a great deal of talk on how to additively manufacture multi-material single components to leverage European materials' expertise. Or on how to combine additive methods with traditionally successful subtractive techniques in the same production line to take major steps towards the integrated factory of the future. Or on how to reach repeatable short series production for the automotive sector, which is regarded as the next big target in terms of technology maturity for additive manufacturing.

Remarkably, these are all subjects tackled by the Vanguard democase projects. As industry group for additive manufacturing, CECIMO reckons that major advances on these areas will allow Europe to keep its lead on this important production process over the next five, ten years. These are areas that will determine the growth of this technology in the near future.

Why is CECIMO involved in Vanguard?

The sharp focus of Vanguard on business-critical issues in additive manufacturing is a strong enough reason for CECIMO to be part of this initiative. We are proud to sit in the steering committee of the high-performance production through 3D-Printing pilot. Our role in that context is to network with regional authorities, services bureaus, academia, competence centres and other relevant entities that are part of the democases. We are acting as the bridge between businesses, including technology providers, and the web of Vanguard regions committed to advance this technology. In addition to collaboration between regions, which is in itself welcomed as an instrument to minimize fragmentation in the European additive manufacturing value chain, cooperation between industry and actors in the Vanguard ecosystem is vitally important too. Ultimately, both strands of cooperation accelerate the journey towards translating Vanguard's democases into commercial solutions for the benefit of European industry and society.

CONCLUDING REMARKS

Antony FELL, European Forum for Manufacturing, Secretary General
Secretary General

Antony Fell highlighted three points. First, the importance of the regions of Europe and the first meeting of the Regions in liaison with the EFM, at the initiative of former MEP and EFM Board Member, Michael Theurer, (now in the Bundestag) in 2015. This had developed into representation of over 20 Regions across Europe represented at the current event. The two initiatives: ERRIN and VANGUARD well illustrated this. Second, the next Council Presidency from 1 July, Finland, had invited the EFM to participate in a briefing on their industry priorities.

In conclusion he thanked the Representation of the State of Baden-Württenberg to the EU for hosting this Regional Forum on Manufacturing. In particular he thanked all the speakers including the European Commission, the State Commissioner for European Affairs, VANGUARD and ERRIN representatives and CECIMO. He warmly thanked Bodo Lehmann and Fabian Jägerhuber for their organizational input, chairing and contribution.