



ADDITIVE MANUFACTURING EUROPEAN CONFERENCE

7 June 2017

European Parliament, Brussels

organised by

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European Association of
the Machine Tool Industries

AMEC III TAKEAWAYS

Europe has a deep expertise in additive manufacturing (AM). It has all the ingredients needed to maintain its competitiveness in the near future, though the overall landscape is changing. New competitors emerge on the world's stage, so, to retain Europe's position in AM, EU authorities must accelerate their support actions. This was the main message of the 3rd edition of the Additive Manufacturing European Conference (AMEC) which took place in the European Parliament on 7 June 2017. The event brought together 100 participants from the AM industry, authorities and academia, and strengthened CECIMO's position as representatives of the needs of AM companies in Europe. It also confirmed firms' interest in the EU institutions as a critical interlocutor to support the industrialization of additive technologies across the continent.

Co-hosted by the Members of the European Parliament (MEPs) Brando Benifei (S&D, IT), Anthea McIntyre (ECR, UK) and Cora van Nieuwenhuizen (ALDE, NL), the conference was divided into two panels, one on the challenges for the industrial deployment of AM and one on skills for the sector. High-level industrialists and European Commission officials joined the MEPs in the discussions, moderated by Bernhard Langefeld, Partner at Roland Berger and Onno Ponfoort, Practice Leader 3D Printing at Berenschot Consulting.

Integrate AM into the existing production environments

Far from being a standalone solution, AM must be treated as complementary to conventional industrial processes. The industrialization of AM is about integrating additive machines into processes together with milling, EDM, heat treatment machines and others. Today, AM adds value to the components produced, but, in such an integrated context, it is also able to foster the emergence of new business models in the near term.

Pascal Boillat, Head at GF Machining Solutions, highlighted the instrumental role of Industry 4.0 solutions in supporting this additive-subtractive complementarity. *"We need a smooth exchange of data between additive and traditional machines to achieve a fully automated production chain"*, he said. Mr Boillat predicted that the interaction of the two types of machines will be a key area for the industry over the next two/three years.



From left to right: Pascal Boillat, Nikolai Zaepernick, Cora van Nieuwenhuizen, Jean-Camille Uring, Peter Dröll and Jon Porter.
Picture © European Parliament.



Anthea McIntyre. Picture © European Parliament.



Marcus Burton. Picture © Frank Coenen.

Cora van Nieuwenhuizen, too, noted that connectivity is fundamental to foster machine-to-machine communication and improve simulations. She stated that digitisation offers a lot of opportunities. That is why, she continued, the European Parliament and European Commission are now working to build reliable communication. Improving connectivity is indeed a key driver to scale up AM in the European industrial field. *“For all your AM processes, you need proper digital infrastructure”*, Ms van Nieuwenhuizen underlined.

Streamline standardization and certification efforts

The uptake of industrial AM needs a more efficient approach to standards’ development.

Mr. Nikolai Zaepernick, Senior Vice President Central Europe at EOS GmbH, pointed out that common standards are a boost for today industry. *“If we look at the subtractive world, we see that everything is quite defined and regulated. Standards also help in streamlining R&D and avoiding multiple uncoordinated directions. They really help to keep R&D to the point”*, said Mr. Zaepernick, while drawing a parallel on the state of play on standards in AM and in conventional manufacturing. Standardization activities are plenty in the additive space, both at national and European level, but there is a need to centralize them and keep them more pertinent.

For Jon Porter, Business Development Manager at Renishaw, the process of standardizing additive technologies is important. He though reckoned how some standardization activities around the world are focusing on the same issue, potentially drawing time and attention away from other AM aspects.

The standardization process was also subject to comments from the EU authorities on stage. Peter Dröll, Director for Key Enabling Technologies DG Research & Innovation - Directorate D, European Commission, focused on the related issue of certification. *“Europe can help. We have a clear added value there”*, Dr. Dröll mentioned, and explained how in the 2018-2020 period the EU Horizon 2020 programme will invest 1.6bn EUR in industrial technologies, including additive technologies. Among the others, this money will go into the development of certification standards and processes. *“We will invest substantially”*, Dr. Dröll announced.

Build a joint approach to tackle the disconnection between education and workforce

The short supply of AM competences was clearly highlighted by several panelists and the digital aspect of AM captured great attention.

Ulli Klenk, Principal Key Expert for Additive Manufacturing at Siemens Power and Gas, praised the EU initiatives in the skills field. He stressed that a concerted action must be the way forward: *“It is not an either/or choice (...). I really see in the joint approach of authorities, educators and private companies a way to enhance competences and improve curricula in the education systems”*. *The formal recognition and standardization of skills acquired should be another priority in the AM skills domain. “I believe in creating European standards (...). We have to guarantee the quality of skills in Europe”*, he affirmed.

On the issue of a broader engagement in shaping curricula, Marcus Burton, Director at Yamazaki Mazak UK Ltd, explained that *“industry should be involved in curriculum development. Our experience in the UK is that curriculum development can be sluggish. We are now in game-changing technologies and I think industry has got to work very closely to make sure the curriculum is kept up-to-date”*. He also considered helpful joint efforts at European level, where best national initiatives on skills are shared.

Do not underestimate the added value of re-training existing workers

Key for the deployment of additive methods in Europe is not only teaching AM skills in the educational context, but also re-focusing skills of existing workers. As emerged from the event, this should be done at all levels and through targeted trainings, including on-site activities and digital tools.

Daan A.J. Kersten, Co-founder & CEO at Additive Industries, noted the benefits of addressing the lack of AM awareness among the technology’s potential end-users. Indeed, *“most of the technology is developed in Europe, but the applications are largely found in the US. We should wonder how that has developed”*. Mr. Kersten made the example of how one of the largest OEMs in the world dealt with the issue. It singled out 50 talented engineers within the company and trained them intensively on AM. These were then sent across the different divisions of the firm with the objective of exploring whether additive techniques could be used for specific applications as replacement for conventional methods. Within 90 days, the team of engineers found that the company could save 500mn USD if it embraced additive production in a range of applications.

Engineers are not the exclusive target of AM training strategies. Jean-Camille Uring, CECIMO Immediate Past President and Chairman of AddUp, emphasized that AM is a complex process, where different physical aspects interrelate with one another. *“You cannot just take somebody trained for milling, turning or any other machining process”*, said Mr. Uring while describing the specificities of the metallurgical and digital process in AM. According to him, authorities have a clear role in supporting training for this technology, including those of technicians and operators already working in the manufacturing environment.

EU policy-makers showed their readiness in taking actions to upgrade the competences of existing workers. Kirsi Ekroth-Manssila, Head of Unit at the European Commission, DG Internal Market, Industry, Entrepreneurship and SMEs, emphasized the impact of technology on human capital. *“The modern economy and the modern industry call for a very wide range of new skills, and this is especially true for AM”*, she said before reinvigorating the commitment of the EU authorities. *“We need to ensure that Europe stays at the forefront of this very disruptive technology”*. Ms. Ekroth-Manssila then described specific funding initiatives in the agenda of the European Commission. Among these, there were specific EU funds for the AM industry within a soon-to-come strategic action, entitled Blueprint for Sectorial Cooperation on Skills.



Pascal Boillat. Picture © Frank Coenen.



Brando Benifei. Picture © Frank Coenen.



From left to right: Onno Ponfoort, Daan A.J. Kersten, Alexander Oster, Ulli Klenk, Kirsi Ekroth-Mansilla and Filip Geerts.
Picture © European Parliament.

Invest on software solutions and expertise to maintain competitiveness

Panelists raised the importance of software for the further industrialization of AM in Europe. EU funding support for software development was deemed essential to enable a fully digital value chain. In terms of expertise, digital capabilities were recognized as fundamental to accelerate the adoption of additive techniques on Europe's factory floors.

"European shortages are on the skills side and especially on the software side", said Alexander Oster, Director of Additive Manufacturing at Autodesk, after describing the links between AM and digital manufacturing. He explained how new engineering software solutions have propelled design into the era of connection. Advanced sensors make possible that *"a product never ends, but self-evolves"*. By expanding the design options in AM, software is thus seen as an added-value of this technology and so are the people behind it. *"If there is one disadvantage comparing to the US, that is on the availability of software talent",* he underlined.

Guarantee significant EU R&D funding on a long-term to strategic European sector like AM

In an evolving industrial landscape, EU research funding must be put at disposal of AM, a technology where Europe enjoys a prominent position.

Filip Geerts, CECIMO Director General, saw in EU research tools a way to tackle outstanding AM issues such as part quality. EU decision-makers must demonstrate a long-term funding commitment to AM, as European-level research pools together expertise across the continent. This is particularly needed now that the next R&D programme is being discussed. He noted that we have to think strategically about AM when we elaborate FP9, the multiannual research programme that will replace Horizon 2020 in about three years from now.

During the event, policy-makers acknowledged the relevance of R&D for the industry. For Ms. McIntyre, it is a matter of guaranteeing technology developments to reach the market. She drew attention on grants that should not just go to blue skies research, but should be channeled towards projects for practical applications of the technology. This would be beneficial, in particular, to those SMEs interested in AM, but without the resources to invest in multiple basic research fronts. *"They need to be able to test the new technologies while they continue to conduct their core business",* she said.

At a time of profound digital-driven innovations, Mr. Benifei stressed too the importance of supporting R&D investments in AM. For him, it is critical grants from the EU budget are allocated to innovative sectors, among which he saw AM as a priority. *"We need to support innovations that create opportunities",* Mr. Benifei affirmed talking about the changes brought by technology.