"ADVANCED PRODUCTION TECHNOLOGIES FOR CIRCULAR MANUFACTURING"

REPORT

Innovative and cutting-edge technologies, such as Additive Manufacturing, automation, digital or laser technologies provided by the machine tool sector help in achieving more sustainable and circular manufacturing. This was the key message of a conference organized by CECIMO in partnership with the 2019 EU Green Week and the European Economic and Social Committee. The event was organised in Brussels on 23 May 2019 and aimed at discussing the role of new advanced manufacturing technologies in the implementation of the circular economy.

Sustainable growth as a political priority

Tellervo Kylä-Harakka-Ruonala, Vice-president of the Employers Group at the Economic and Social Committee, opened the event by highlighting the circular economy was at the heart of sustainable development, which was of the priorities in the agenda of the Economic and Social Committee. She added that the circular economy was not a zero-sum game and that it had the potential to bring about triple wins in terms of environmental, social and economic aspects. She pointed out that while businesses had an important role to play in a transition towards a more circular economy, policy makers also had a crucial role by providing enterprises with a policy and regulatory framework that enables and encourages enterprises to innovate, invest and lead the way to smart, low carbon and circular economy.

Sustainable growth through a better functioning single market, climate and security was also one of the main priorities of the Finnish presidency, to take place in the second half of 2019. Janne Peltola from the Permanent Representation of Finland to the EU, highlighted the need for adopting a more holistic approach, where single market, industrial policy, digitisation and the external policy dimension were strongly interlinked and complementing each other to pursue growth. He also pointed out that the flight against climate change was also important for the competitiveness of the EU. The EU has a leading role in a transition to a climate neutral economy and should promote climate neutrality worldwide. He pointed out it was vital to foster multilateral cooperation globally to reach the energy targets in the most efficient way.

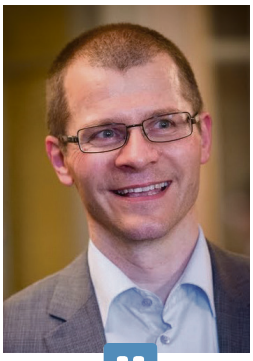
Cosmina Miu on behalf of the Romanian permanent representation highlighted the word done under the Romanian presidency in relation to industrial policy. She highlighted that the Competitiveness Council Conclusions on Industrial policy welcomed the full delivery of the circular economy Action Plan but that further work was still needed. She stressed the important role of new technologies, the need to support innovative SMEs and to focus on new business models.

Talking about the next European Commission, Ruben Dekker seemed to be convinced that the push towards sustainability would remain and it would include an approach to the circular economy. He also stressed that better synergies needed to be built between circular economy, climate and digital policies.

The machine tool sector as provider of more sustainable manufacturing technologies

Filip Geerts, CECIMO Director General, introduced the recently published CECIMO report on the European Machine Tool Sector and the Circular Economy and highlighted the role of the sector as a provider of advanced manufacturing technologies contributing to a more circular and sustainable manufacturing sector.

As explained by Stefan Dahl, Head of Advanced Manufacturing at GF Machining Solutions, one of these technologies is laser surface texturing. More than 80% of textures in manufacturing are done by chemical etching. Laser texturing technologies provide a cleaner alternative to etching processes and create 3D textures directly out of digital data. This means no use of chemicals, a 100% repeatable and simplified process, a reduced scrap level and a full digital process: all contributing to a more sustainable production and products. He also pointed out that an important aspect to consider was how advanced manufacturing technologies could help to produce parts with superior efficiency in their life-time. To this respect he gave the example of Gasoline Direct Injection (GDI). Through this technology gasoline is injected directly in the chamber saving 15% of fuel compared to previous gasoline engine technologies. The development of GDI was only possible with the development of a new manufacturing technology, phentosecond laser drilling.



Circular economy targets quite often go hand in hand with business targets. More efficient solutions for manufacturing are typically also helping from the sustainability and circular economy point of view.

Juha MÄKITALO
CEO of PEMAMEK OY

By introducing robotics and automation technologies we were able to reduce the environmental impact of the company. We reduced energy consumption by around 30% and CO2 by more than 400 tons/year.

Monika ŠIMÁNKOVÁ
General Director of
HESTEGO a.s.

Regarding demand for more sustainable technologies Monika Šimánková, CEO of Hestego, highlighted that more sustainable technologies if coming at a higher price should also be accompanied by additional benefits in order to be accepted by customers. There is always the need to build a business case and show how these technologies can translate into higher productivity and increased efficiency.

The role of digital technologies

Stefan Dahl and Philippe Reinders Folmer, General Manager Renishaw Benelux, highlighted the role of digital technologies in relation to sustainability. Renishaw explained that machine tools are "blind", they do not know exactly where the piece or the tool is. Through in process-monitoring and control, the operator can oversee the whole process rather than checking the piece at the end of it. The process can be then corrected while still running, which results in less waste and more efficiency.

Stefan Dahl also explained how digitization can help in the remote servicing of machines, meaning a faster solution of problems, reduction of downtime, increased production capacity and saving resources. During the panel discussion and looking at the future, Juha Mäkitalo CEO of Pemamek, stressed that digitisation was the area to concentrate on. He added there were hardware technological developments that could advance circular manufacturing, but the biggest developments were coming from the software side. To this respect, Stefan Dahl pointed out that 30 to 50% efficiency gains can be achieved through software improvements.

Additive Manufacturing as enabler of the circular economy

Additive Manufacturing (AM) can contribute too to sustainability by using only the needed materials and by consolidating the number of components within an assembly. Both Philippe Reinders Folmer and Erik de Zeeuw from Materialise highlighted how AM helps to save resources and, in some cases, to produce lighter parts. Such a characteristic helps to reduce energy consumption during the use phase of the product, which is especially important in sectors like transport. They also pointed out at AM as an interesting technology in relation to customised products, small series and production on demand. Looking at the future, Erik de Zeeuw pointed out that further research should be done on material uses and efficiency for AM.

The need for skills

Both Cosmina Miu and Juha Mäkitalo highlighted the importance of skills and education in relation to the transition to a circular economy. Cosmina Miu stressed the importance of STEM (Science, Technology, Engineering and Mathematics) education and she pointed out that the need for skilling and re-skilling would be a problem we would face more and more. Juha Mäkitalo agreed with her and stressed that in an area such as the machine tool sector where a product can have a lifetime of 30 or even 40 years, it was necessary to keep specialised knowledge not only on current and future technologies and products but also on the past ones.

No one-size fits all solutions

Said El Kadraoui from the European Political Strategy Centre concluded the panel discussion by pointing out that moving forward with circularity implied a lot of things and that there was no silver bullet to get there. The transition would require further research and innovation, collaboration with customers and new skills. He pointed out that policy makers may need to look at different sectors individually and see how best they can support the transition to a circular economy.