

# Long-term Technological and Industrial Plan [Executive Summary]

May 2020



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The SAM project (Sector Skills Strategy in Additive Manufacturing) aims to deliver together with all partners and stakeholders a shared vision and collaborative skills solutions capable of fostering and supporting the growth, the innovation and competitiveness of the AM sector.

One of the pillars of the strategy is the definition of a long-term technological and industrial plan which collects the major technological developments foreseen to happen in the next 10 years, until 2030. This ensures the identification of skills needs in AM, guaranteeing that a skilful workforce is ready when required.

Additive Manufacturing technologies are evolving at a much faster pace than the development of the skills to use them, that is why the industry demand for skilled workforce must be fulfilled. The focus of the report is to analyse and identify the technological breakthroughs foreseen to happen until 2030 which are related to the 3 following segments:

1. Materials
2. Process/Manufacturing
3. Post Processing

Throughout the full version of the Report, Long Term Technological Plan, a set of initiatives in Additive Manufacturing are mapped encompassing networks, platforms and research programmes must also be updated. Also, specific roadmaps for AM technologies and applications are analyzed. These existing roadmaps include issues related to AM technologies, standardisation, certification, skills and education, financing, intellectual properties, safety, communication, as well as cross-regional and international cooperation. Common trends on the Roadmaps seem to indicate a general lack of appropriate skills in design, processes, materials, quality and testing, which might be hindering the adoption of these technologies and the development and validation of new products.

Table 1 - Coverage comparison between technological roadmaps

Roadmap	Topics					
	Materials	Processes	Post-processing	ICT (AI, cyber security)	Quality	Skills
AM- Motion	X	X	X		X	X
America Makes	X	X	X	X	X	X
SAMT SUDO project	X	X				X
VDMA	X	X		X	X	X
Lloyds Register – Roadmap	X	X			X	X
AM UK National Strategy	X	X		X	X	X
STREAM roadmap	X	X				

The report shows that there are several technological trends at material, technology, post-processing, ICT and quality assessment fields that will bring new innovations in the coming years to deal with current AM challenges and industrial needs.

The full report produced by the SAM consortium can be accessed **in full here**. However, a results of the preceding analysis, are important to highlight at this stage, when it comes to conclude about the main points identified in the 3 segments and the cross-cutting quality and ICT fields and their direct influence on skills development in a short (2020-2021) and long term (2022-2030) period in the field of AM, shown below.

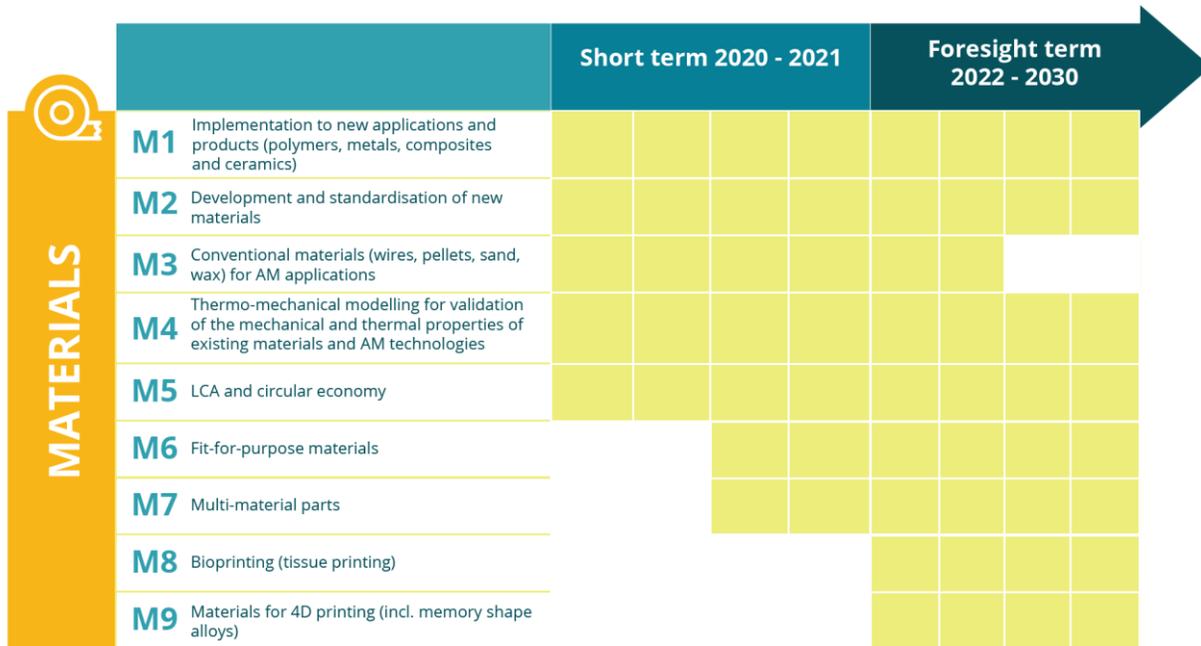


Figure 1 - Materials Trends

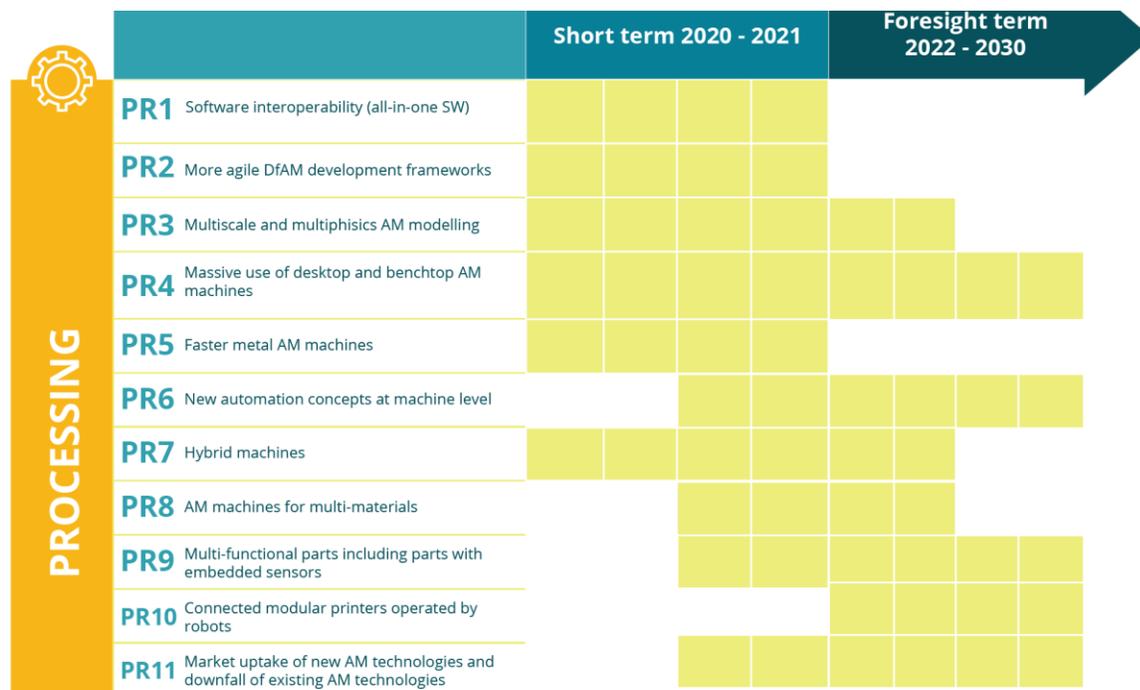


Figure 2 - Processing Trends

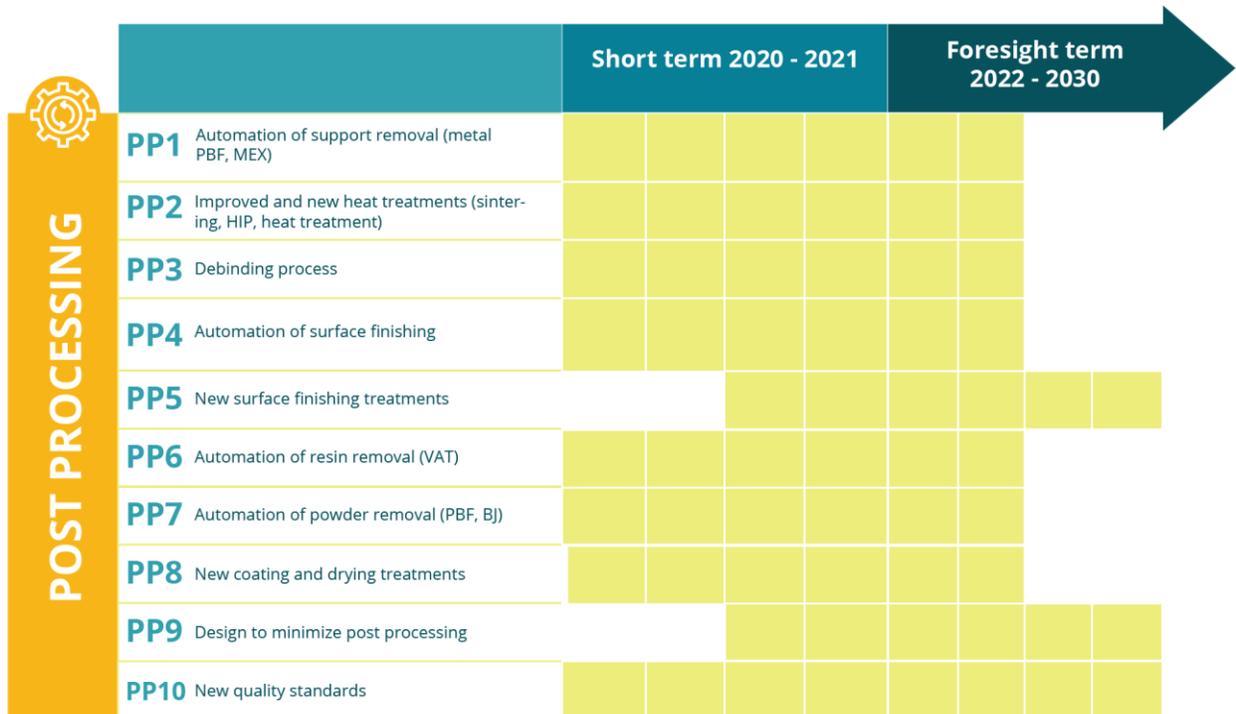


Figure 3 - Post-Processing Trends

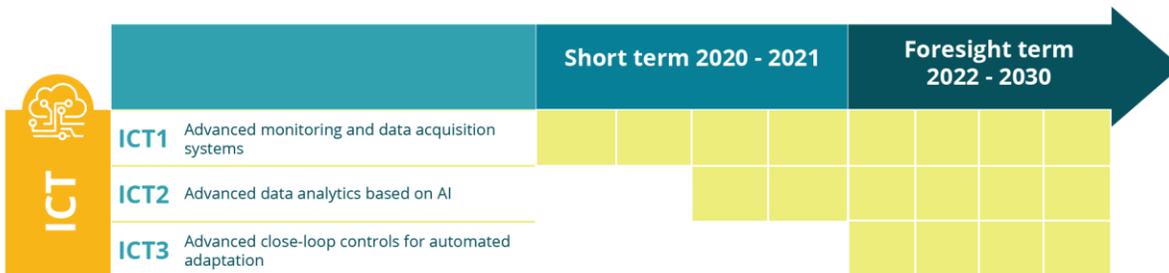


Figure 4 - ICT Trends

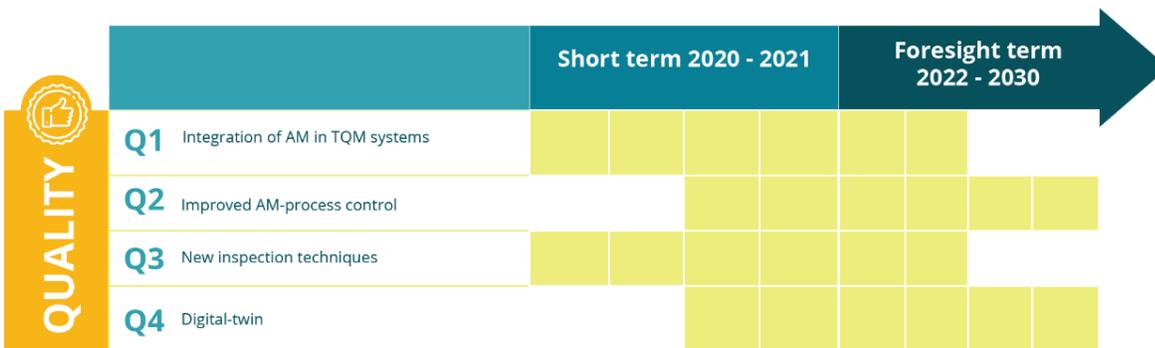


Figure 5 - Quality Trends

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The overall conclusion is that the identified segments confirmed to be the most required technological breakthroughs at short and long-term.

Regarding the cross-cutting ICT field, the prospect of using ICT solutions (e.g., smart software, robotics, Artificial Intelligence and Big Data) and massive automation in AM processes, it requires the need for specialized workforce to undertake research and innovation activities towards the successful industrial implementation of both existing AM technologies and new innovations.

Also, from the analysed roadmaps, quality in AM appears as the most covered cross-cutting field, indicating the need to address this topic in the future.

For that reason, the main skills defined for AM will be focused on Materials, Processing, Post-processing and Quality. Nevertheless, as already mentioned, SAM will use a collaborative approach through the AM Observatory, to promote the use of AM technology, which requires analysing current and future needs in AM, undertaking raise awareness and training activities at European level and in within the partner countries as a starting point. This means that these conclusions may be adjusted over time.

Finally, the mapping of initiatives in AM and related areas enabled to conclude that the range of initiatives at International and European levels are aligned, foreseeing to boost the competitiveness of the manufacturing industry by investing in policies, infrastructures, research and human resources.

# SAM is developing an European Observatory in AM that is identifying and anticipating the right skills and deliver them to the Industry/Companies through a solid network of European Training Centers

## About the Project



### Erasmus+ Sector Skills Alliances

Sector: Additive Manufacturing

Participants and Countries: 9 countries: Belgium (EWF, EPMA, CECIMO, Materialise), Germany (LZH Laser Akademie), Greece (Panepistimio Patron), France (EC Nantes), Italy (POLIMI), United Kingdom (MTC, Brunel University), Spain (IDONIAL, Lortek, AITIIP), Portugal (ISQ, FavoriteAnswer); Ireland (IMR).

Project duration: 4 years (1.01.2019 – 31.12.2020)

Website: [www.skills4am.eu](http://www.skills4am.eu)