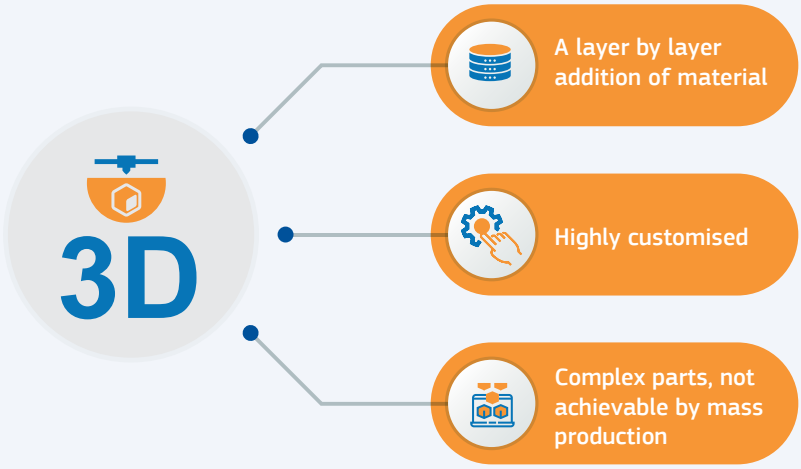
# 3D printing has the potential to revolutionise manufacturing and production

## Product Watch: 3D printing of hybrid components

## 3D printing

A key advanced manufacturing technology in Europe is **three-dimensional (3D) printing.**

3D printing is considered a highly innovative manufacturing solution with a great potential to revolutionise manufacturing and production globally. It is highlighted as a technology that is central to digital transformation, and part of the fourth industrial revolution.

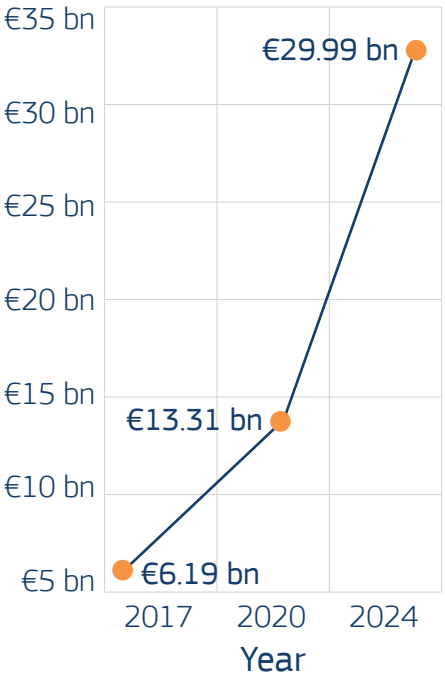



Focus is on **3D printing of metals** as it is a stronghold in Europe, with many players situated in:

- **France**
- **Germany**
- **Italy**
- **Sweden**

3D printing is regarded as a high **growth technology.**

Revenues 3D printing products and services (globally):

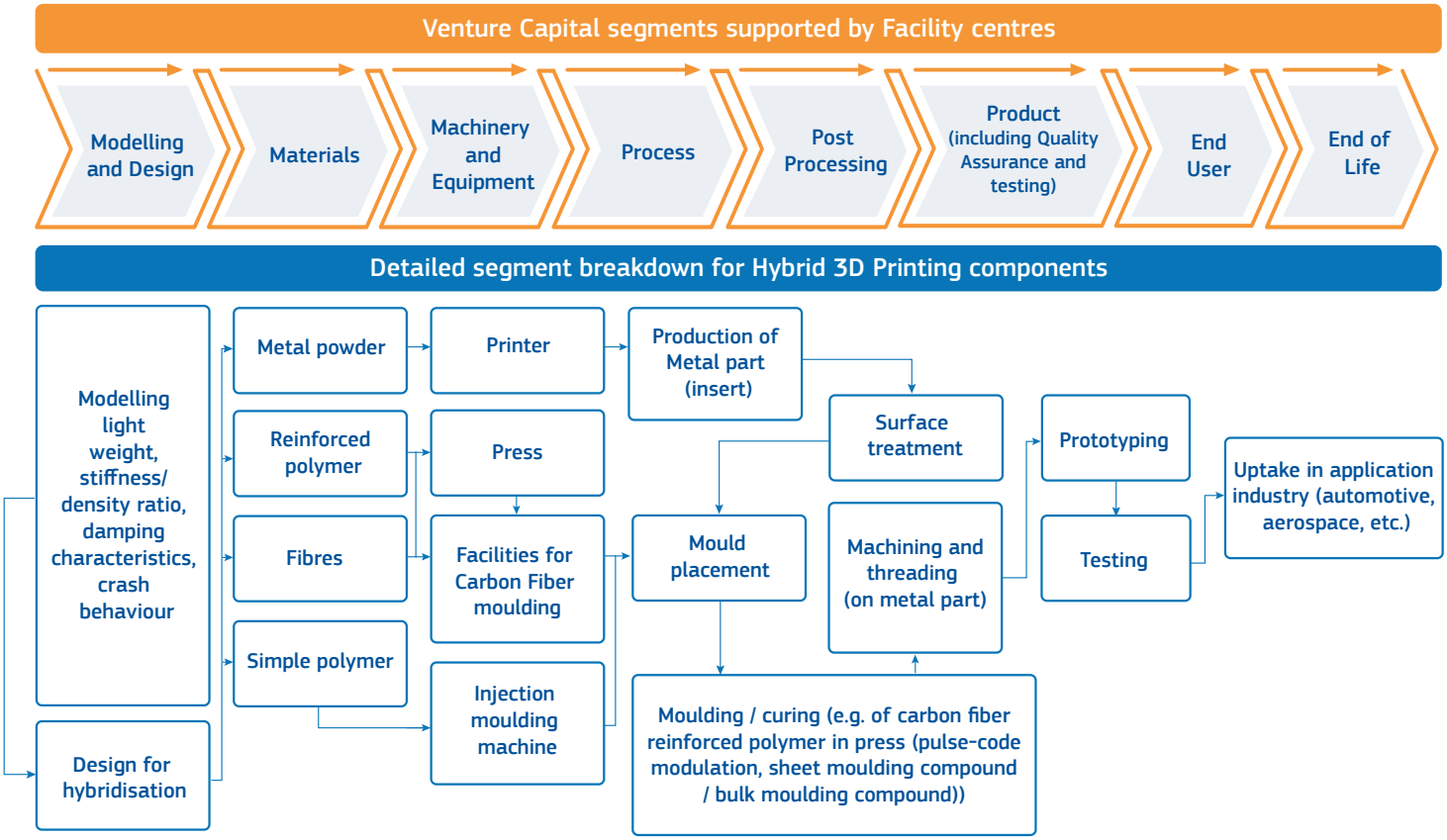



Source: Wohlers Report (2019)

For more information, read the full Product Watch on 3D printing of hybrid components here:
https://ati.ec.europa.eu/reports/product-watch/3d-printing-hybrid-components

# 3D printing represents a dynamic and disruptive technology that is a key component in the digitalisation of industry and the transformation to Industry 4.0

## The value chain structure can be outlined into key segments:




Adapted from the Vanguard Initiative '3D Printing Pilot',
https://www.s3vanguardinitiative.eu/cooperations/high-performance-production-through-3d-printing

## A series of key actors are essential in the realisation of the value chain:

### Machinery and equipment manufacturers

The technology of the printer determines the parts that can be manufactured

### Materials suppliers

Have the responsibility to supply adequate materials

### Service providers

Companies specialised in supporting the development of 3D printed parts

### Facility centres

Support in the development and demonstration on the technological solution

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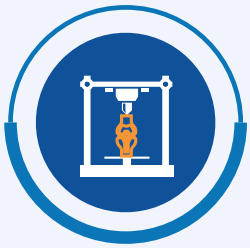
## 3D printing opportunities for other sectors:

3D printing and Carbon Fiber Reinforced Polymer (CFRP) hybrid parts are important for the automotive sector. Moreover, hybrid material structural components based on 3D printed metals are relevant for other sectors such as aeospace, healthcare and consumer goods. These are some application areas for **metal and CFRP components.**

**Aircraft structures:** 3D printed titanium fitting joined to CFRP plate



**Prosthetic knee:** 3D printed metal socket and pylon joined with CFRP

**Satellite parts:** metal part joined with CFRP to create a camera baffle for a satellite

## The EU is a front runner in metal and hybrid 3D printing but faces challenges in terms of standardisation and scarcity of raw materials

### Strengths

- Europe as a front runner in metal and hybrid 3D printing
- Ability to create complex and custom parts
- Components are lightweight

### Challenges

- Lack of standardisation (Europe is lagging behind)
- Sustainability (lots of energy consumption results from 3D printing)
- Skills and education (there is a need for appropriate training)

### Opportunities

- Wider application areas for hybrid metal 3D printed and CFRP components
- Besides metal and CFRP, other forms of hybrids parts and processes also exist

### Risks

- Scarcity of raw materials
- International competition from the United States and Asia
- Brexit (as UK is active in 3D printing)

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# What will be the future of 3D printing technology?

**Improving the deployment of technology**

3D printing presents the possibility to develop stronger, lighter and more complex parts

**3D printing for new possibilities**

3D printing targets the creation of new designs and to enable new ways of thinking

**European competitiveness requires fostering and strengthening the existing position**

European companies have benefitted from the political commitment to advance the technological development in the area of 3D printing

**The huge potential of 3D printing**

3D printing technologies have huge potential for many industrial applications

**Sustainability**

Make Europe the first climate neutral continent

**Deglobalisation**

An opportunity to locally produce parts

## About the Advanced Technologies for Industry (ATI) project

The ATI project – funded by the European Commission – supports the **implementation** of Europe's new growth strategy with a systematic monitoring of **technological trends** and reliable, **up-to-date data** on advanced technologies.


The **Product Watch** analyses novel products that are based on advanced technologies for the development of goods and services - enhancing their overall commercial and social value. It supports cluster organisations and S3 partnerships, providing intelligence on innovation areas where European regions could team up and invest together.

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