



# FlexHyMan

*A Flexible Hybrid Manufacturing system*

**EUROPEAN  
MANUFACTURING  
INNOVATION**

- The development of metal AM technologies has been massive over the last decade
- New high added-value industrial sectors (aerospace, automotive) adopt AM in their production
- AM cannot produce parts on its own that will comply with the requirements of those sectors
- Subtractive processing in an integrated hybrid platform is the solution can effectively address this issue
- Such a platform must be modular, flexible and scalable, with reasonable investment cost to attract industries to adopt hybrid manufacturing

- FlexHyMan offers a modular, robot-based hybrid manufacturing platform consisting of:

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## MILLING MODULE

- High Speed Machining robot
- Compact structure with low footprint and large working envelope
- Comparable stiffness and accuracy to a machine tool
- High scalability
- Cryogenic cooling system for sustainable machining

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## DED MODULE

- Standalone DED head; can be retrofitted in existing machines
- Modular design enabling multiple configurations according to application
- Lightweight structure
- 4 co-axial nozzles ensuring smooth powder delivery
- High deposition rates

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## 3D SCANNING MODULE

- Comprised of two 3D scanners
- Positioning systems enable automation of the 3D scanning process
- High density and quality point clouds generated
- Algorithms developed for comparison of actual with nominal part and programming of corrective toolpaths

## To production

- Optimized hybrid processing strategies for high added value materials (e.g. Ni-based alloys)
- Reduction of processing time through optimal exploitation of AM, milling and 3D scanning

## To the workplace

- Safe and sustainable machining through the elimination of toxic oil-based coolants and adoption of cryogenic cooling
- Reduction of work floor space by adoption of a robotic-based platform

# Manufacturing matters!

The manufacturing industry is a global base for **prosperity** and key to Europe's **economic, social** and **environmental** sustainability. Manufacturing is a main driver of **industrial innovation, job creation** and growth for the European society



Over **2.1 million** manufacturing enterprises



**32 million** jobs  
(16% of the total EU working population)



Approx. **13 million** jobs in the growing high-tech manufacturing industry<sup>1</sup>



**16.1%** of the share of EU-28 GDP<sup>2</sup> (2016)



Total turnover of EUR **7.11** trillion<sup>3</sup>