

## **EMN for Advanced Manufacturing**

Harald Bosse, PTB  
harald.bosse@ptb.de

Acting Chair of EMN for  
Advanced Manufacturing

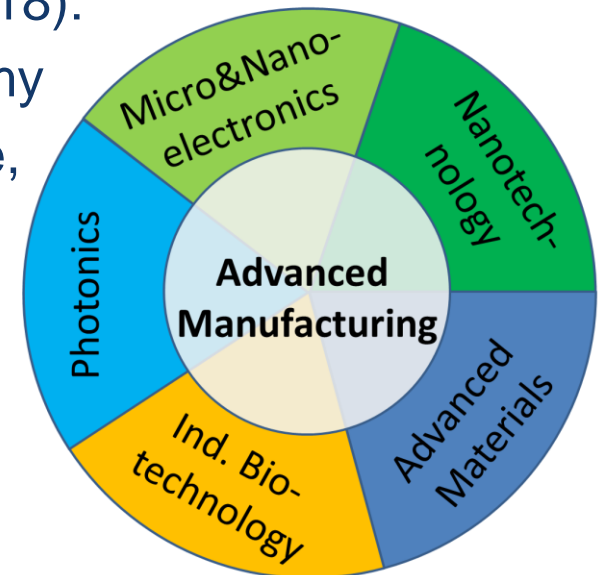
Coordinator of 19JNP01 AdvManuNet

# Advanced Manufacturing



The need for the EMN for Advanced Manufacturing

- **Advanced manufacturing (EC):**
  - one of six Key Enabling Technologies (KETs)
- Applications in multiple industries
  - full exploitation of KETs: creating advanced & sustainable economies
- European Technology Platform **MANUFuture**:
  - [Vision 2030](#) strategy document (HLG, 12/2018):
- Manufacturing: backbone of European economy
- 2014: 2.1 million enterprises, 30 million people, 1 710 B€. However: European manufacturing has been losing ground
- In 2030, European manufacturing will be competitive at global level due to its high-performance and technological level, targeting **zero-defect, zero-delay, zero-surprise and zero-waste production processes**



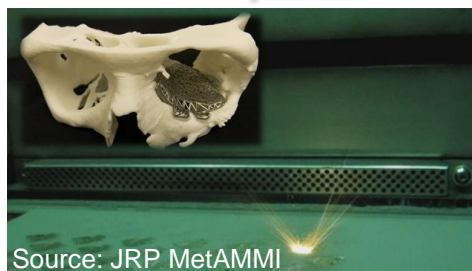
KETs (EC, 2009)

# Metrology demands



**Aim: zero-defect, zero-delay, zero-surprise and zero-waste production processes**

Examples:  
metrology  
demands



## Example:

- Additive Manufacturing:
- in-process metrology
  - fast & holistic metrol.



## Example:

- Machine tools:
- improved control by 5G sensor technology
  - sensor integration: metrology data interface



## Example:

- Lithography tools:
- full simulation of relevant processes
  - metrology tools using AI data algorithms



## Example:

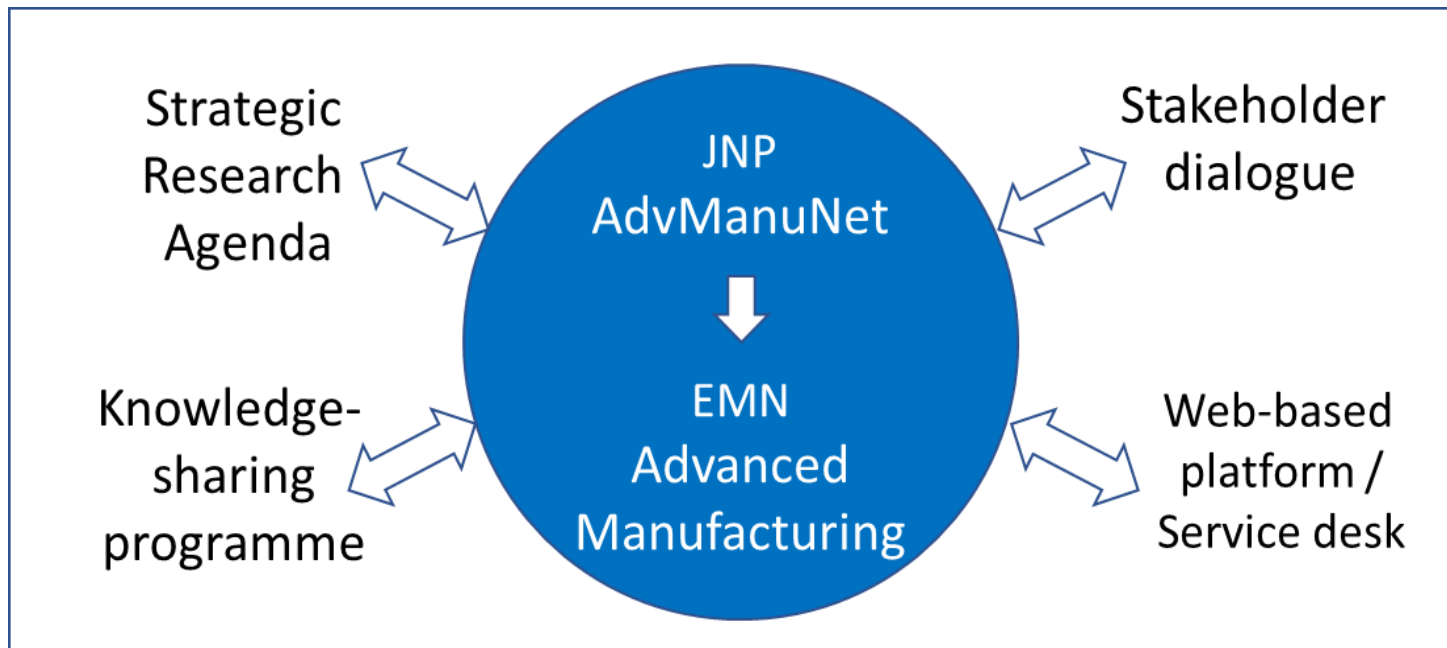
- Machine tools & Additive Manufacturing:
- less scrap via hybrid manufacturing chains (MT & AM)
  - reduced energy consumption by advanced machining processes

## • EMN sections:

- Advanced Materials
- Smart Manufacturing Systems
- Manufactured components and products

# Major activities for EMN

JNP: funded project within EMPIR to accelerate process of establishing EMN



EMN: European Metrology Network for Advanced Manufacturing:  
- Sustainable network operated by national metrology institutes

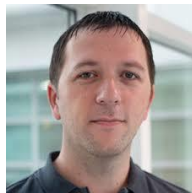
# JNP consortium



## JNP 19NET01 AdvManuNet 4 years, start 6/2020: Project partners



euspen HQ, UK:  
Dishi Phillips



NPL, UK:  
Daniel O'Connor

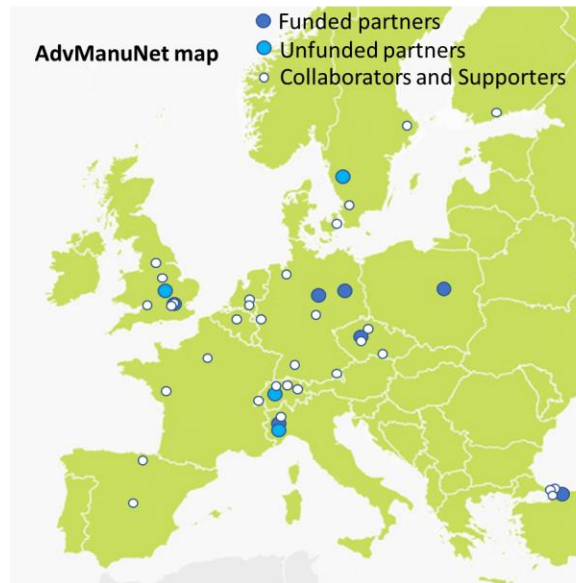


METAS, CH:  
Felix Meli



PTB, DE:  
Harald Bosse  
JNP coordination

- Head of PTB Division Precision Engineering
- TC-L chair: 2015-2019
- CCL delegate of PTB
- euspen president: 2017-2019
- [harald.bosse@ptb.de](mailto:harald.bosse@ptb.de)



BAM, DE:  
Alexander Evans



RISE, SE:  
Olena Flys



CMI, CZ:  
Vit Zeleny



GUM, PL:  
Dariusz Czulek



INRIM, IT:  
Alessandro Balsamo



POLITO, IT:  
Carlo Stefano Ragusa



TUBITAK UME, TR:  
Tanfer Yandayan



The EMPIR initiative is co-funded by the European Union's Horizon 2020 research and innovation programme and the EMPIR Participating States

# EMN Scope and achievements so far



Achievements so far:

- 2 paper, 3 accepted conf. submissions, 1 workshop, 1 manuscript under review
- Proposed definition of “Advanced Manufacturing”
- Identified 13 Key Industry Sectors (KIS) relevant for EMN
- Stakeholder council members: EURAMET Research Council; KIS; EU Partnerships
- Defining EMN Scope:

The EMN will address metrology issues along whole manufacturing value chain:

- Design
- **Advanced materials => Smart Manufacturing Systems => Components & Products**
- Recycling

Involved NMIs/DIs: BAM, CEM, CMI, CNAM, DFM, DTI, INRIM, IPQ, GUM, LNE, METAS, PTB, NPL, RISE, SMD, UME/TUBITAK, VSL, VTT

Main EMN expertise from colleagues in TC-L, TC-T, TC-M (hardness, force, ...)

Expertise from other TCs (incl. WG M4D) and EMNs will be integrated whenever needed

Partnering with:

- European Partnerships [Made in Europe](#) / [EFFRA](#) - European Technology Platform (ETP) [MANUFuture](#);
- H2020 CSA project [NanoFabNet](#); - [euspen](#); - ...

## **Acting chairperson of EMN for Advanced Manufacturing:**

Dr. Harald Bosse

Head of Division 5 “Precision Engineering”  
Physikalisch-Technische Bundesanstalt (PTB)  
Bundesallee 100  
38116 Braunschweig

Tel.: +49 531 592 5010  
email: [harald.bosse@ptb.de](mailto:harald.bosse@ptb.de)