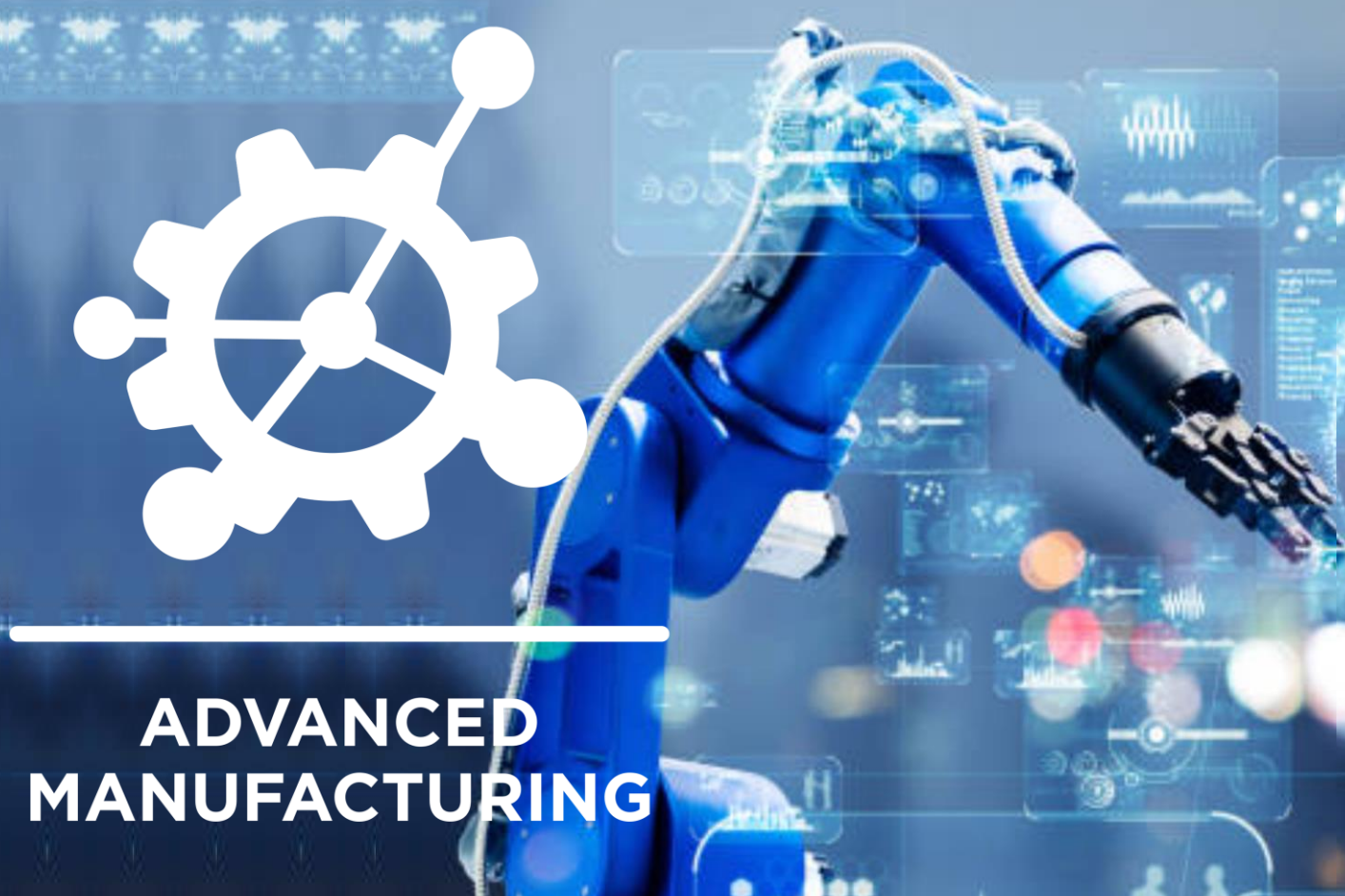




ADVANCED
MANUFACTURING

EURAMET's European Metrology Network



BIPM | 150 |

Harald Bosse¹, Alessandro Balsamo², Luca Boarino², Fernando A. Castro³, Alexander Evans⁴, Antti Lassila⁵, Daniel O'Connor³, Anita Przyklenk¹
¹PTB, Braunschweig, Germany; ²INRIM, Torino, Italy; ³NPL, Teddington, United Kingdom; ⁴BAM, Berlin, Germany; ⁵VTI MIKES, Espoo, Finland
harald.bosse@ptb.de

INTRODUCTION

The European Metrology Network (EMN) for Advanced Manufacturing (Tab. 1, Fig. 1) has been established in September 2022. Currently, 12 EMNs focus on topics of strategic importance for Europe and form an integral part of EURAMET, the European Association of National Metrology Institutes (NMI). EMNs are tasked to

- develop a **high-level coordination of the metrology community in Europe in a close dialogue with the respective stakeholders**
 - develop a **Strategic Research Agenda (SRA)** within their thematic areas
 - provide input for the **European Partnership on Metrology** research programme
- Based on the analysis of **existing metrology infrastructures and capabilities of NMIs**, the **metrology research needs for advanced manufacturing** are identified in close cooperation with academic, governmental and industrial stakeholders. Here, we report on the critical metrology needs to support advanced manufacturing in Europe.

WHO WE ARE

Table 1: Current EMN members, where the partner expert is euspen [1]. The stakeholder council is mainly composed of representatives from industry. To exploit synergies the EMN collaborates with int. associations and organisations, such as AMI2030 [2], Chips JU [3], EFFRA [4], ManuFuture [5], NanoFabNet [6], VAMAS [7].

EMN Members & Partners	
NMIs and DIs	18
Primary contacts	18
Cross-sectional experts	15
Advanced materials experts	17
Smart manufacturing systems experts	14
Manufactured components & products experts	15
Partner expert	1
Stakeholder council members	13
International associations/organisations	6

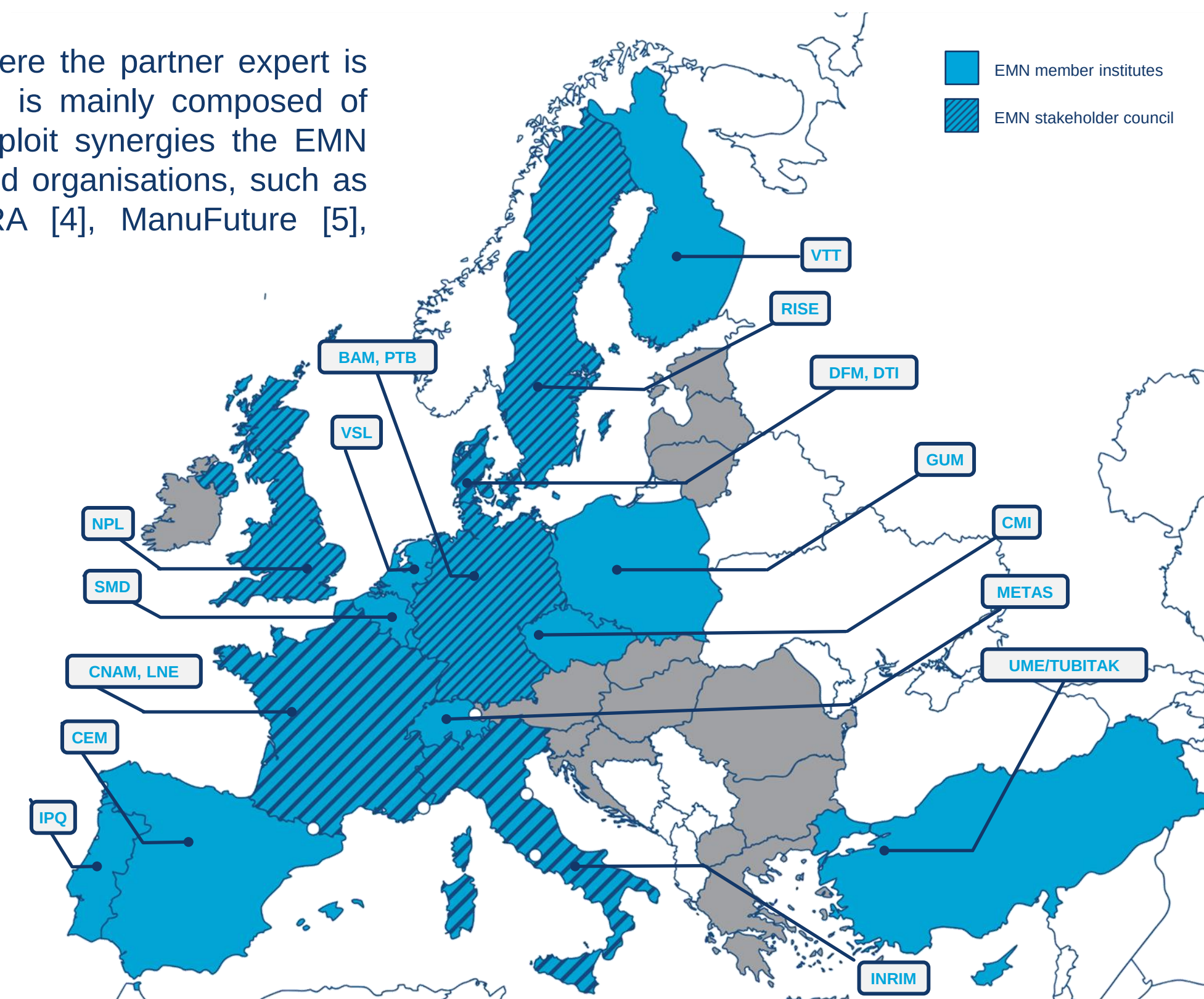


Figure 1: Map of EMN members.

OUR OBJECTIVES

All EMNs are tasked with a regular **stakeholder dialogue** in their respective areas (Fig. 2). Stakeholders of the EMN for Advanced Manufacturing are

- associations, organisations and partnerships
- academia and research institutes,
- cutting-edge companies from industry

To cover the variety of metrological solutions along the manufacturing chain, the EMN operates in **three sections**:

- Advanced Materials
- Smart Manufacturing Systems
- Manufactured Components & Products



Figure 2: Main objectives of the EMNs.

STRATEGIC RESEARCH AGENDA

The SRA identifies metrology requirements for advanced manufacturing that needs to be addressed based on

- metrology and research needs** of stakeholders
- metrology infrastructure needs within EU NMIs

The analysis of research needs is structured along **eight cross-cutting topics** and **13 key industry sectors** (Fig. 5).

Based on ManuFuture's strategy for the realisation of **highly competitive and increasingly sustainable and resilient manufacturing** systems [8], the EMN has developed a vision for metrology to underpin these goals including a fifth target to address the need for increased trust in advanced manufacturing (Fig. 3).

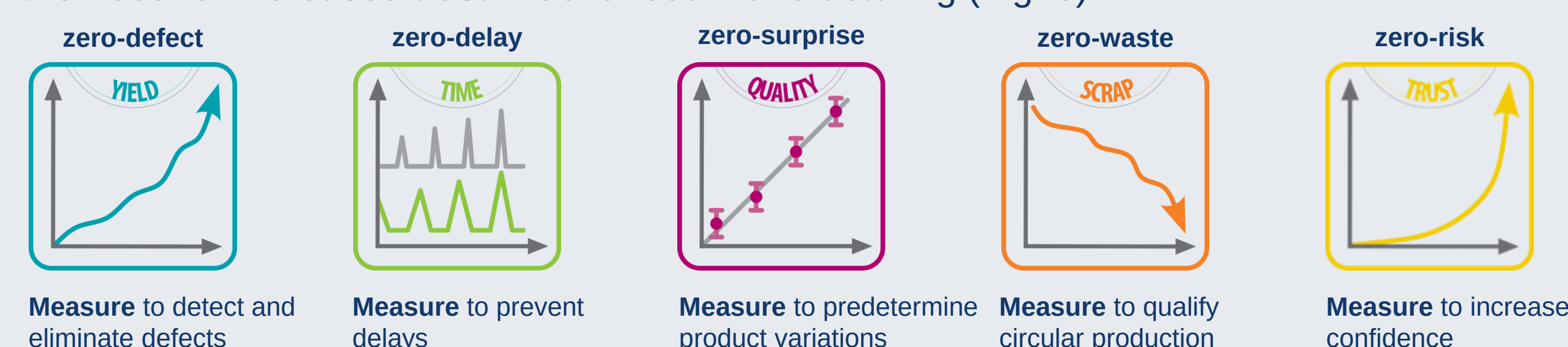


Figure 3: Metrology to support competitive, sustainable and resilient manufacturing.

METROLOGY NEEDS IN ADVANCED MANUFACTURING

Examples of identified metrology needs in cross-cutting topics are illustrated in Fig. 4.

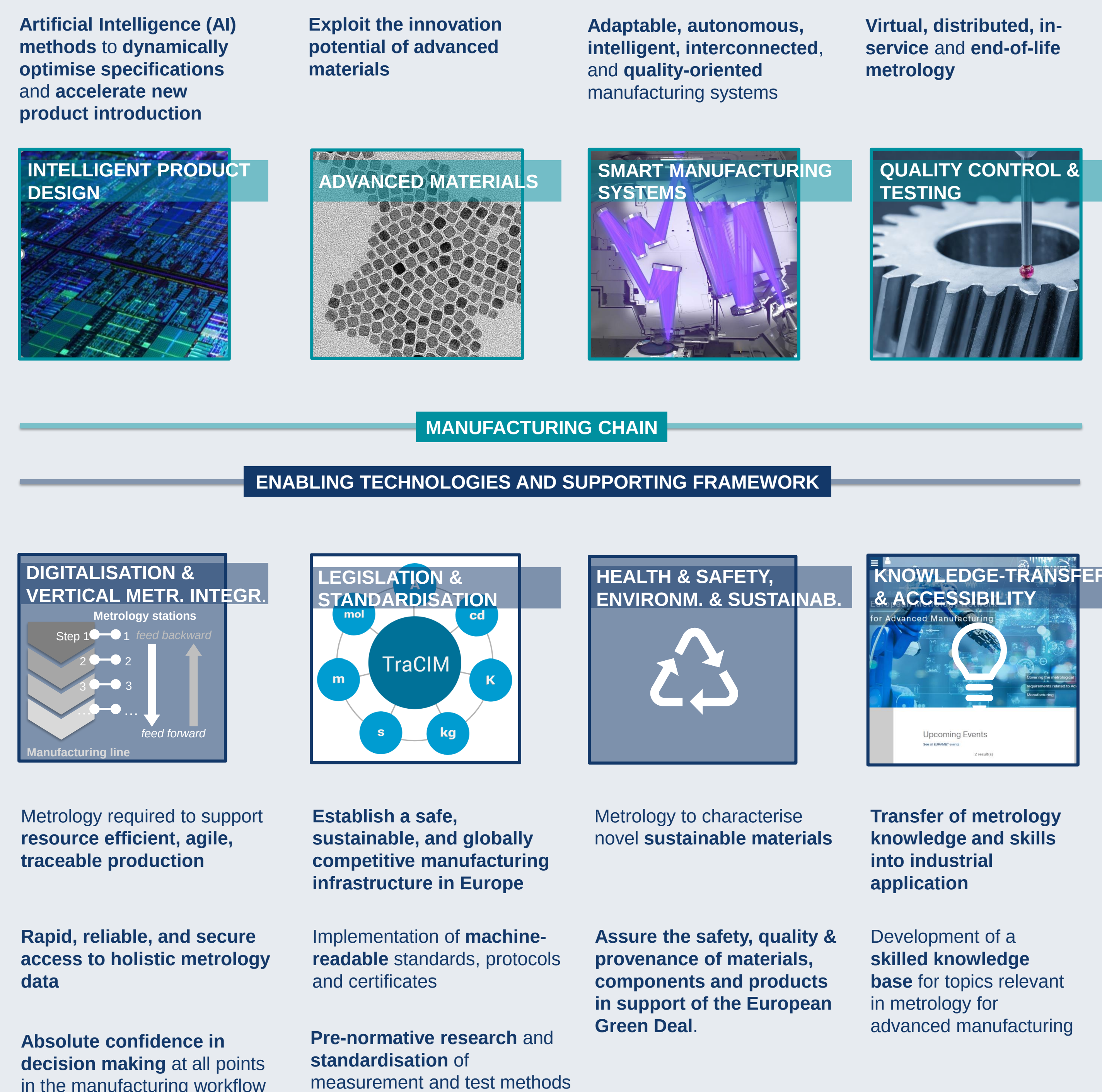


Figure 4: Metrology requirements on advanced manufacturing.

KEY INDUSTRY SECTORS

The EMN is **frequently investigating metrology needs** of 13 key industry sectors (Fig. 5), which have been selected from 19 sectors according to those who were figured out by the European Commission.

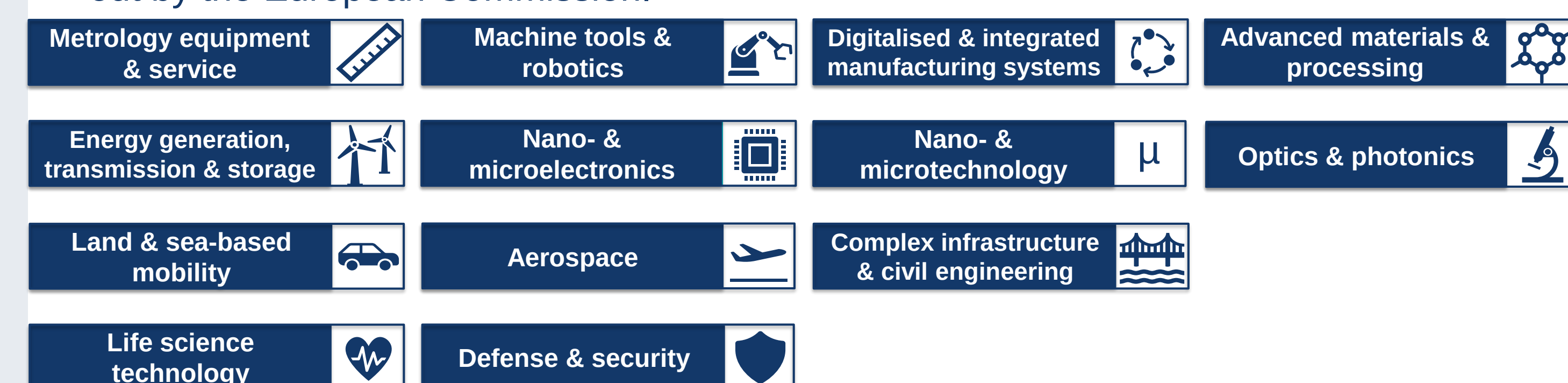


Figure 5: 13 Key industry sectors of the EMN.

A **stakeholder council** that consists of 13 representatives mainly from industry advises the EMN for Advanced Manufacturing on its activities and contributes to the identification of the latest and most relevant topics.

OUTLOOK

An **update of the SRA** is planned to include **competitiveness** aspects that have been raised in the Draghi report Part A and B (2024). According to the current European priority topic „Advanced Materials for Industrial Leadership“, the EMN for Advanced Manufacturing is preparing an **open consultation event on metrology for advanced materials**, which is planned to take place online in autumn 2025. This event will bring together representatives from research, industry and policy to identify the most promising trends and the corresponding metrology requirements.

DOWNLOAD

Are you interested in the **latest and proven stakeholder needs** in the area of **metrology for advanced manufacturing**? Use the QR code on the right and download the **current version of the SRA** prepared by EURAMET's EMN for Advanced Manufacturing.



CONTACT & NEWSLETTER SUBSCRIPTION

Get in touch with us via email advancemanu@euramet.org. Use the QR code on the right for newsletter subscription and visit our website <https://www.euramet.org/european-metrology-networks/advanced-manufacturing>.



REFERENCES

- www.euspen.eu
- <https://www.ami2030.eu/>
- <https://www.chips-ju.europa.eu/>
- <https://www.effra.eu/>
- <https://nanofabnet.net/>
- <https://nanofabnet.net/>
- <http://www.vamas.org/>
- <https://manufuture.org/vision-2030-document/>

ACKNOWLEDGEMENTS

We would like to thank Dr. Karl-Dietrich Inkamp, ZEISS Industrial Quality Solutions Germany and the EMN Stakeholder Council for giving advice and support.

