

MINAM

Micro and NanoManufacturing on the Horizon 2020

Dr.-Ing. Konstantin Konrad | Dipl.-Ing. (FH) Tanja Meyer

Fraunhofer Institute for Manufacturing Engineering and Automation (IPA)

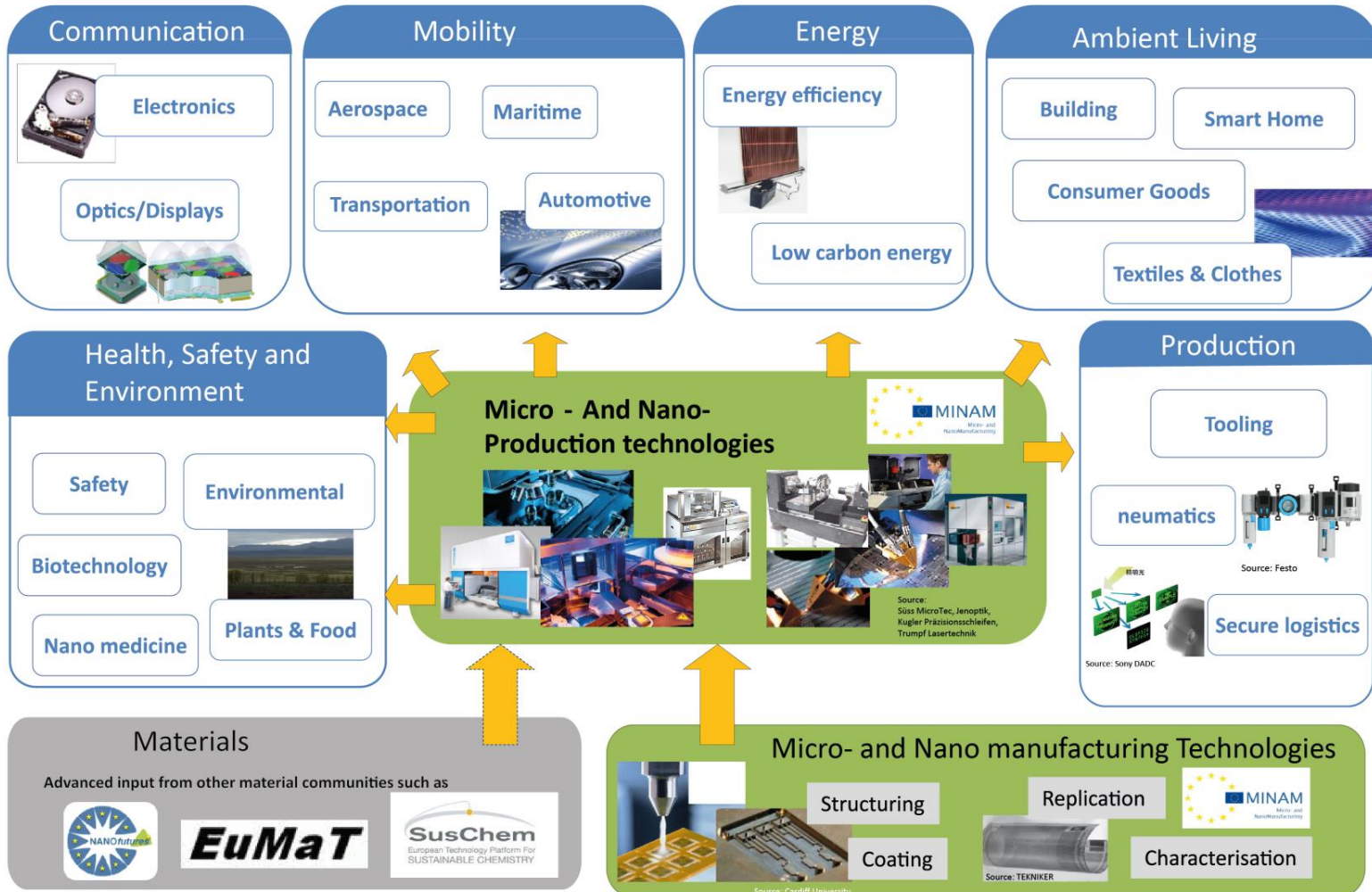
Department of Ultraclean Technology and Micromanufacturing, Stuttgart, Germany

8th October 2013 | Manufuture Conference | Vilnius, Lithuania

Mission

“To **facilitate the European manufacturers** and equipment-suppliers in establishing and **retaining worldwide leadership in manufacturing micro- and nano-technological products** and paving the ground for a new generation of a **highly effective, application oriented Micro-Nano Manufacturing community** in Europe”

... there are still dozens of application areas that still need to be explored and developed further to face grand challenges



Micro and Nano Manufacturing

Agenda: Horizon'2020

- Addressing key societal needs:
 - Climate change
 - Sustainable transport
 - **Sustainable industrial production**
 - Sustainable food production and consumption
 - Ageing population and public health.
- Supporting the full manufacturing cycle by providing innovative high added value manufacturing solutions
 - Design, production, in-service support, decommissioning and recycling
 - **New generations of multifunctional customised products**
 - Micro and nano manufacturing solutions for meso and macro scale products

Motivation

Building on Lessons Learned while operating MINAM

- Find alternative ways to **engage a broader range of SME's** in European R&D activities
- Hierarchical approaches don't fit well to structures required in a cross sectional community
- a lot of expertise is available at dozens of MNMT related **regional communities** all over Europe – **but not linked**

Strategy

- I) **Accelerate the introduction of Micro/Nano enabled products**
into the market through an improved information exchange
between European Key Players in the Micro Nano Production
technology area => **Set-up a “community of networks”**

- II) Ensure that (future) **Micro/Nano- production technologies** are
in line with the requirements of foreseeable application
developments

- III) **Setup of a sustainable MNT community**
to the Micro/Nano Manufacturing linked community

I) MINAM community- Stakeholder

**16 European
Technology
Platforms**

**7 Scientific
Networks**



Research Infrastructures

8th October 2013, Vilnius

II) Major research challenges

- Light weight, multi material 3D complex products
- Continuous miniaturisation of parts and products
- Integration of nano, micro, meso and macro scale features and products for new generations of multifunctional products and systems
- Emerging micro and nano production technologies to address new life science and health care products
- Maturity and innovation potential benchmarking of micro and nano manufacturing technologies
- Technology affordability
- Built-in intelligence and IP protection

II) Achievements

Roadmapping Recommendations - MINAM contributes to the following aspects:

- Mass production of functional 3D systems
- **Manufacturing for custom made parts**
- **Automated production of composite structures/products**
- *New processing methods to achieve nano-sized microstructure components*
- *Joining technologies*
- *Characterization as key enabler für robust nano enabled production*
- *Europeanwide coordination of process and component standardisation*
- **Delivery of new functionalities through (mass production) manufacturing processes**
- Product life cycle management for advanced materials
- **Multifunctional manufacturing processes**
- New approaches for production planning and control
- Novel supply chain approaches for innovative products



II) Research and Advisory Service

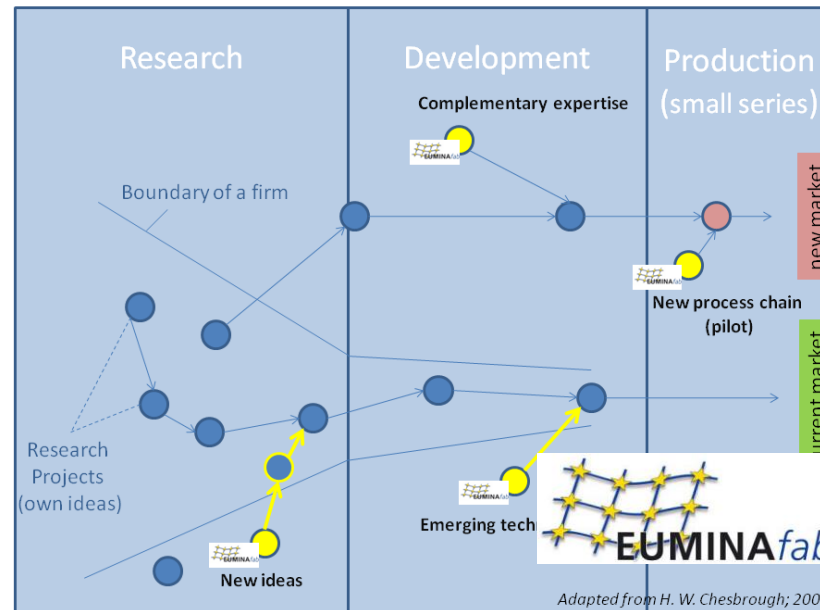
Activities to accelerate the innovation process at SMEs

82% of the interviewees voted: Getting easy access to comprehensive regional and European R&D know-how is interesting for us

The logic of open innovation

➔ Connect to research infrastructures

- ✪ **Provide access** to technologies & application-oriented expertise that is new to the users
- ✪ **Adapt state-of-the-art MNT** to users needs
- ✪ **Accelerate development cycles of users** by providing open access to validated, interoperable MNT



Example



8 partners provide access to

- 36 installations
- with > 75 processes

III) MINAM sustainability

*What
the community demands...*

(Co-) Organization of events
(B2B, calls, matchmaking, ...)

Information hub (database)

Agenda setting towards EC,
lobbying at EU level

European Research Infrastructures

*What
MINAM can provide*

→ MINAM Sustainability
partly based on events

→ Part of Research and Commercial
Advisory Service

→ Already experienced
in MINAM activities

→ Teaming up with EUMINAfab

* Picture source <http://www.smashingbuzz.com/wp-content/uploads/2010/09/Give-Importance-to-Quality.jpg>

MINAM Priorities for Horizon 2020

- Consolidating and expanding the micro and nano manufacturing community
- Focus on meeting industrial needs and delivering industrial innovation
 - Breakthrough research with stronger focus on delivering innovation
 - Sustaining and increasing production capabilities in Europe
 - Focus on growth and value creation
- Understanding and addressing the needs of the wider industrial community via better links with relevant ETPs
- Addressing the needs of both established world class EU industrial sectors and new emerging industries; large companies and SMEs
- Providing a balanced representation of industrial needs and research foresight

- Effective end-to-end management of Dynamic Manufacturing Networks (DMNs) is consistently touted as a top priority for manufacturing enterprises that need to drive to improve their efficiency, adaptability and sustainability of their production systems.
- IMAGINE aims to provide the first complete end-to-end methodology and innovative platform for DMN management, supporting the emerge of a powerful new model of production based on community, collaboration, self-organization and openness rather than on hierarchy and centralized control.

