Lowering Barriers for Nanotechnology Commercialisation

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Overview

- NanoCom Vision and Key Aims
- Background Motivation
- NanoCom Approach and Open Innovation
- NanoCom Workplan
- Key Project Outcomes

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NanoCom Vision

- …bridging the gap between lab based and industrial applications in nanotechnology by creating a European wide approach and mechanisms for lowering the barriers and spreading best open innovation practices for rapid commercialisation and investment in innovative nanotechnology driven products.

NanoCom Key Aims

- To carry out a **critical analysis of barriers** for rapid commercialisation of emerging Nano Technologies that result from many complementary EC, national and industrially funded Research and Development (R&D) projects;
- To **analyse and promote best practices** via new nanotechnology and nano-manufacturing specific open innovation methodology and tools and provide roadmapping, policy and investment advice at EU, national and regional levels;
- To create a **commercialisation oriented forum and mechanisms** for coordinating the efforts of complementary R&D projects in ERA;
- To provide support for **training and dissemination of best practices** for open innovation and commercialisation of nanotechnology.

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NanoCom Partners

	University of Nottingham (Coordinator)		Veneto Nanotech S.C.p.A
	CEA LITEN		Bayer Technology Services GmbH
	Fraunhofer IPA		Nanotrade
	Karlsruhe Institute of Technology		Centro Ricerche Fiat
	Culminatum Innovation Oy Ltd		Acciona Infraestructuras S.A.
	PLASTIPOLIS		LUX EMEA Inc.
	RWTH Aachen University		NineSigma Europe BVBA
	Innobridge		Centre for Process Innovation

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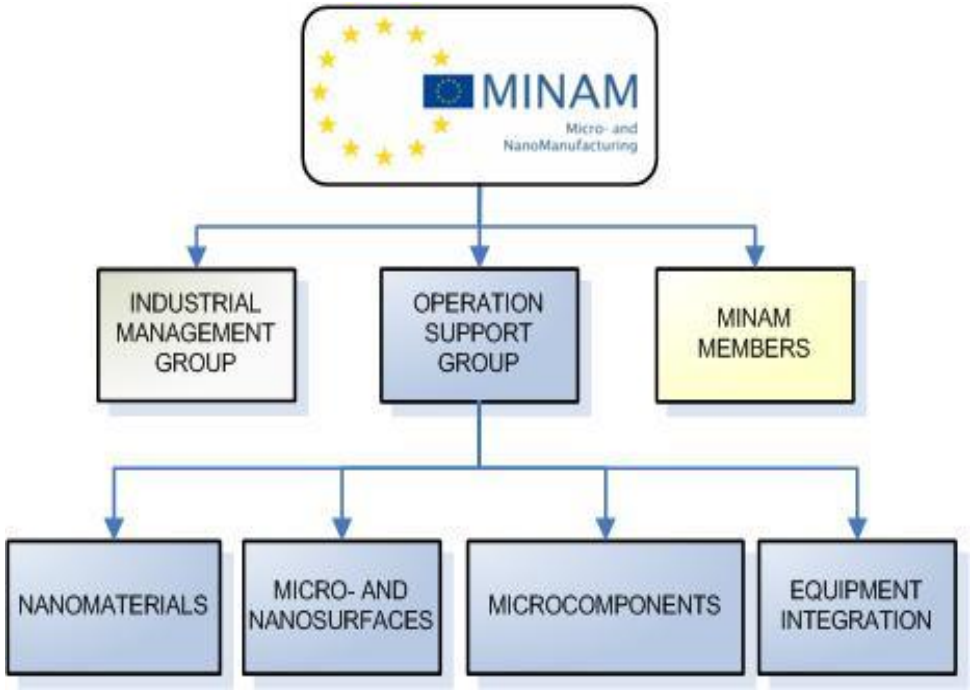
NanoCom Background Motivation
MINAM: VISION and SRA Structure



- Roadmapping
- Manufacturing of nanomaterials
- Manufacturing of nanosurfaces
- Manufacturing of microcomponents
- Integrated micro- and nanomanufacturing systems and platforms
- Social and Economic Impact
- Industrial examples

OSG

IPMMAN Improvement of Production Processes through Integration of Macro-, Micro- and Nanotechnologies

microsapient

4M Network of Excellence Multi-Material Micro Manufacture

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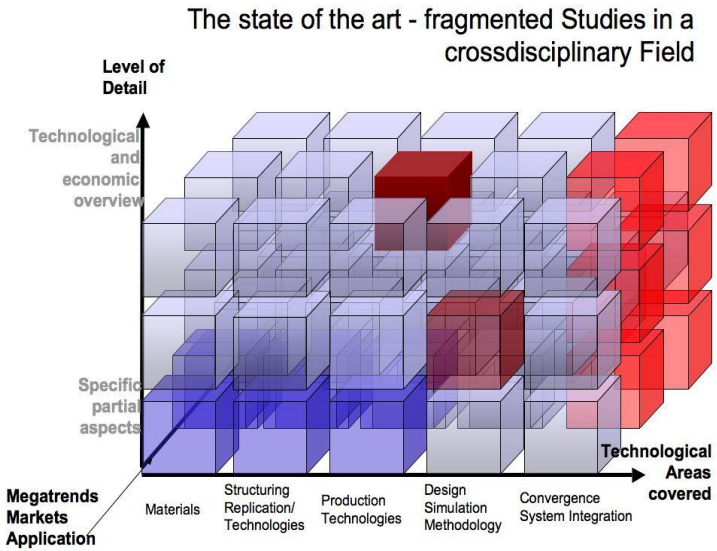
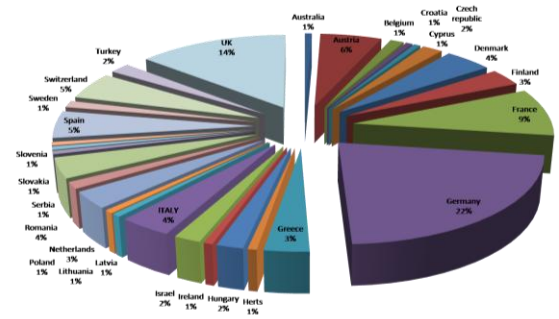
MINAM Roadmapping Activities





2009 (today)

- Efficient mass production merely for specific MST/NST products
- Low modularization, flexibility and scalability
- Industrial standards mainly in Semiconductor industry
- No closed processes and supply chains

2013 (development)

- Intelligent and adaptive systems and platforms
- Sensors with required accuracy
- Solutions for interaction, reliability, standardization and integration of processes
- Flexible, modular and knowledge-based manufacturing systems
- Fabrication in clean and save environment
- Knowledge about process maturity regarding mass production capabilities
- Improved assembly processes regarding velocity discrepancy, motion/position accuracy)

2017+ (vision)

- Mass production of intricate nanoscale structures
- Defined standards (HW/SW) in most industries
- Digital Planning Tools for micro/nano platforms (virtual manufacturing/simulation
- Overall higher precision
- Self learning, auto adaptive and intelligent self controlling processes

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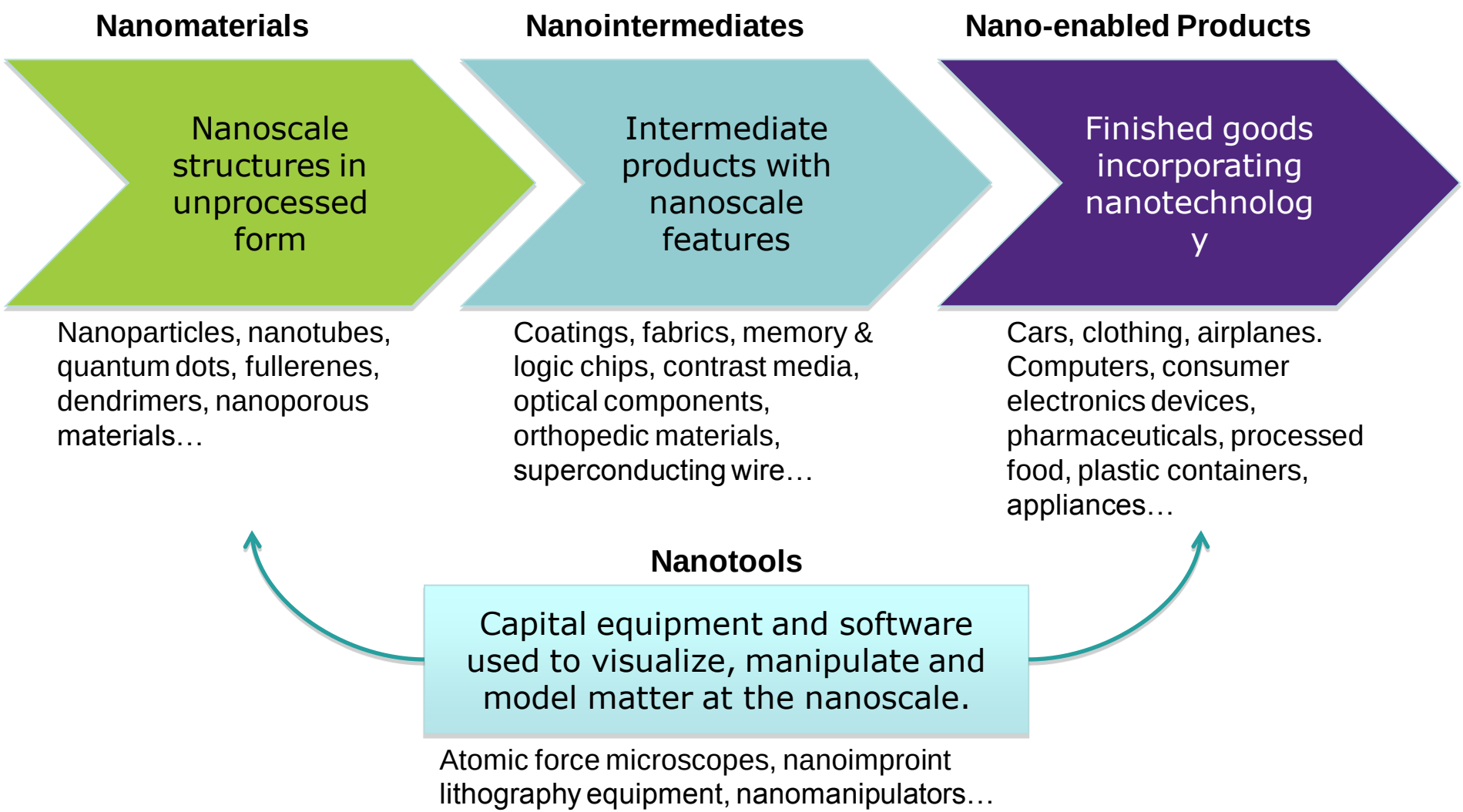
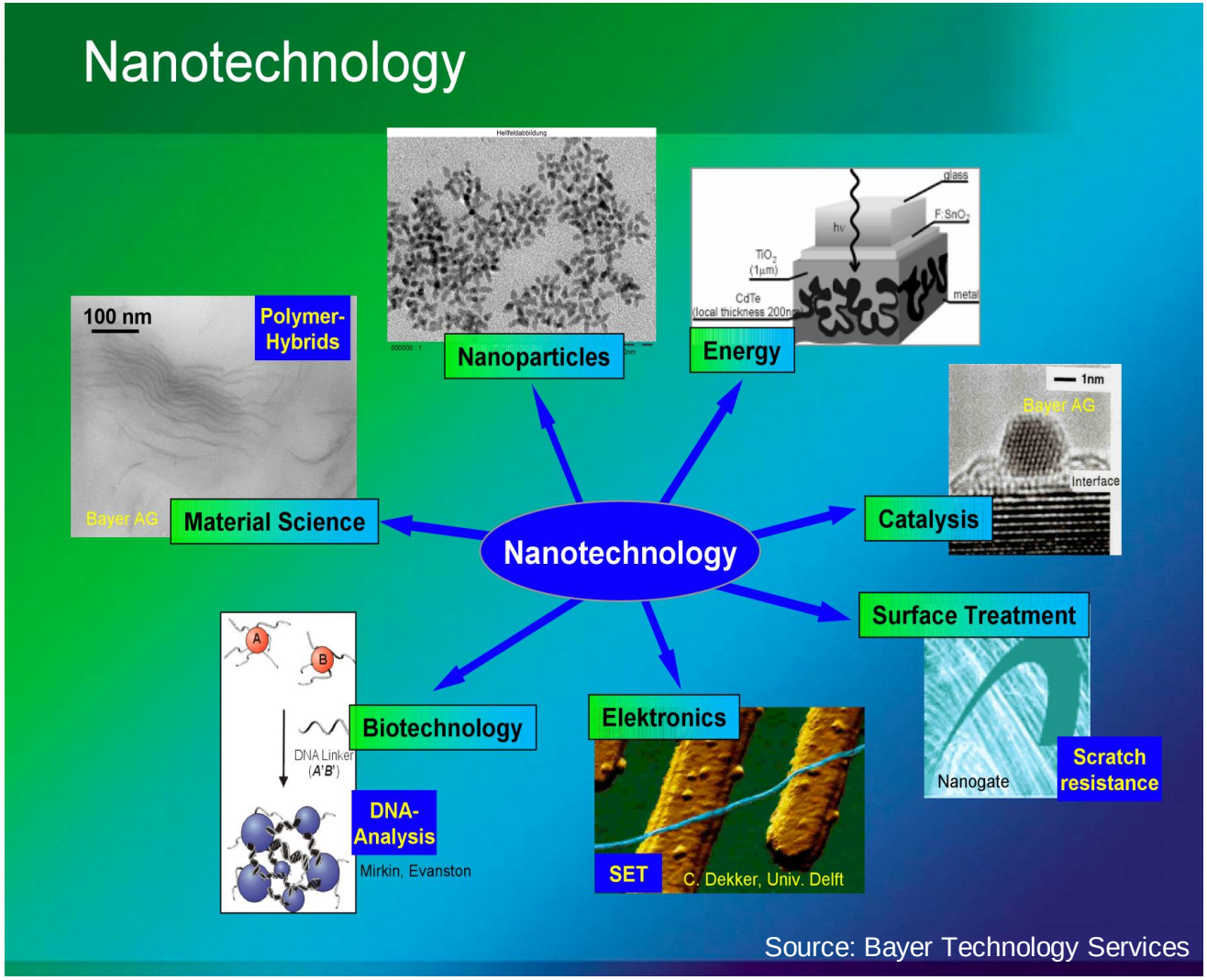
The Nanotechnology Value Chain

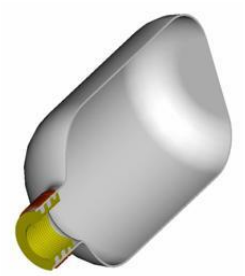


Source: Lux Research "Nanomaterials State of the Market Q3 2008 – Stealth Success, Broad Impact"

Key Research Areas in Nanotechnology



Impact of Micro & Nanomanufacturing:
Automotive Industry



Fuel tank and lines to prevent ignition of fuel

Comformable and integrated solar cells

Transparent conductive composites for displays

Static dissipative plastics to improve the painting process

sensors integrated in bumpers for pedestrian detection

Piezo modular thin sensors embeddable in the bumper

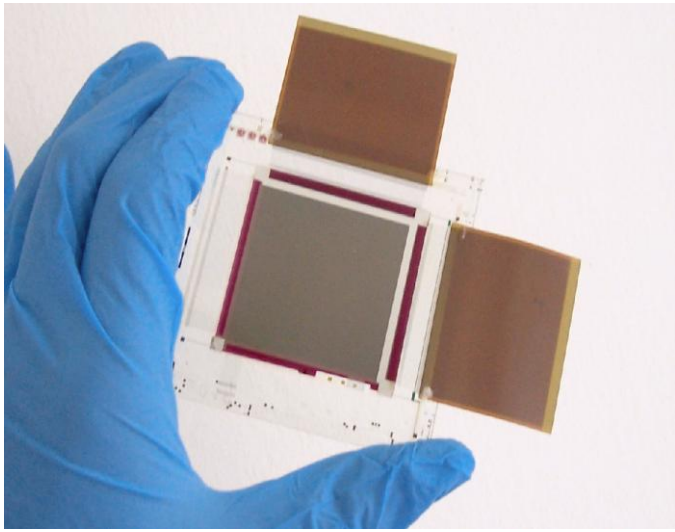
Light emitting integrated for courtesy lighting

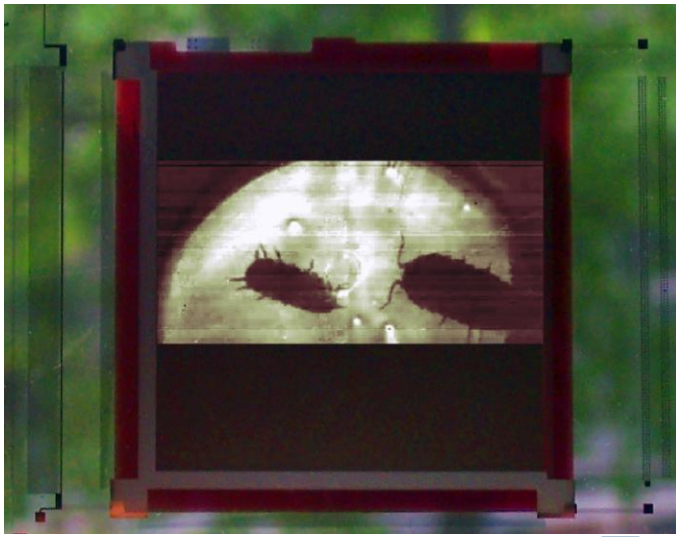
Integrated actuation and sensing in fabric and dashboard

Multifunctional nanocomposite material applications (source CRF)

Made in Europe: Organic Photodiodes for Use as Infrared Sensors

- Research team: Siemens Corporate Technology, the Universities of Linz and Karlsruhe.
- Product: Organic photodiodes that are very sensitive to infrared radiation with wavelengths of more than one µm.
- Applications: measuring processes, including gas sensors, night vision systems, and cancer diagnostics.
- Breakthrough: When used in these technologies, organic photodiodes with semiconductor nanocrystals could result in substantial cost savings.





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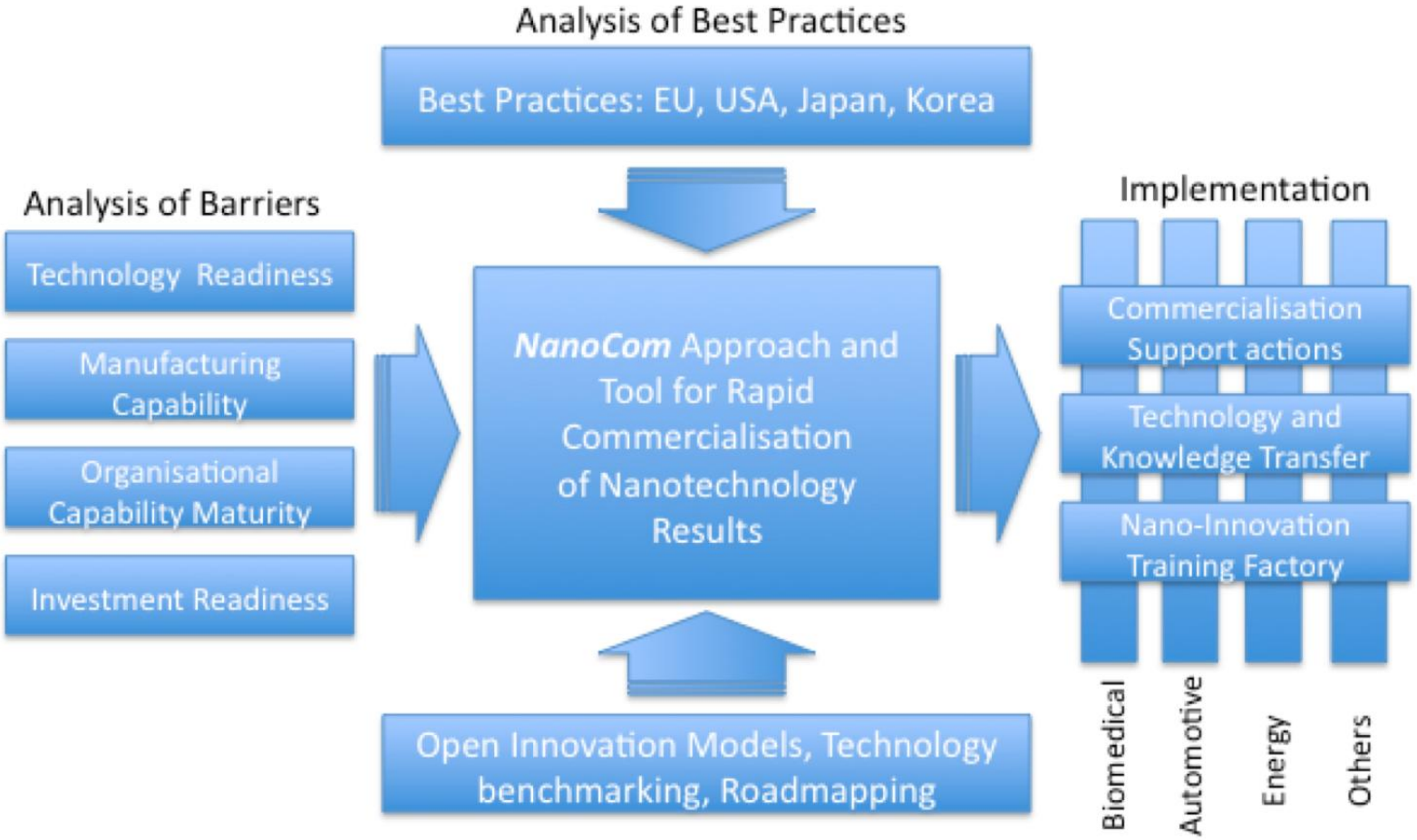
NanoCom Approach

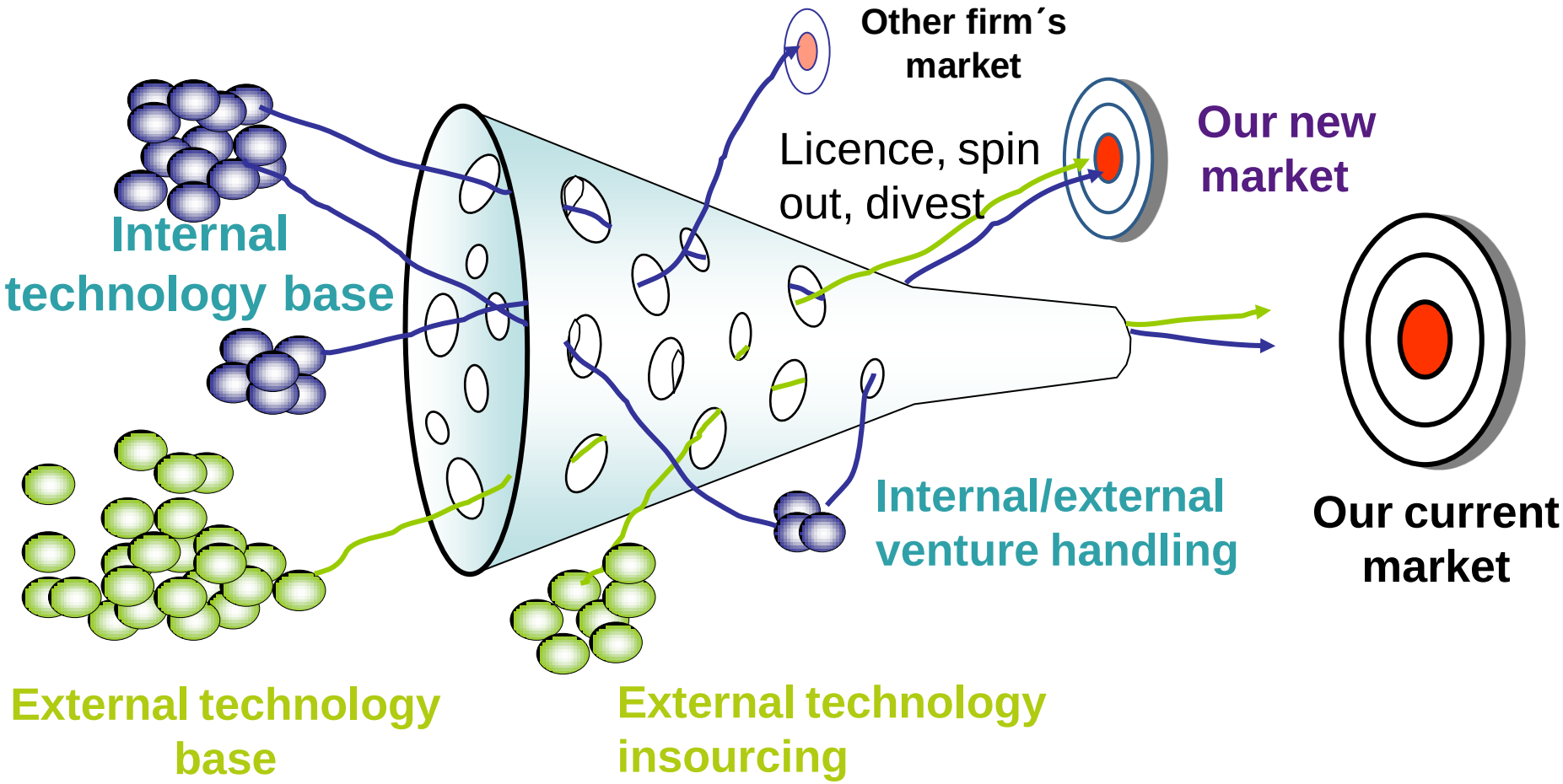
- Commercialisation of nanotechnology results
- Focus on barriers



Focus on barriers

- **Four key types of barriers** to commercialising nanotechnology will be analysed:
  - **maturity of the technology**,
  - **capability of the manufacturing processes** to deliver industrial production,
  - **organisational maturity**, and
  - the **investment environment**

Open Innovation
An Enabler for Commercial Success



Source: Prof Henry Chesbrough UC Berkeley, Open Innovation: Renewing Growth from Industrial R&D, 10th Annual Innovation Convergence, Minneapolis Sept 27, 2004

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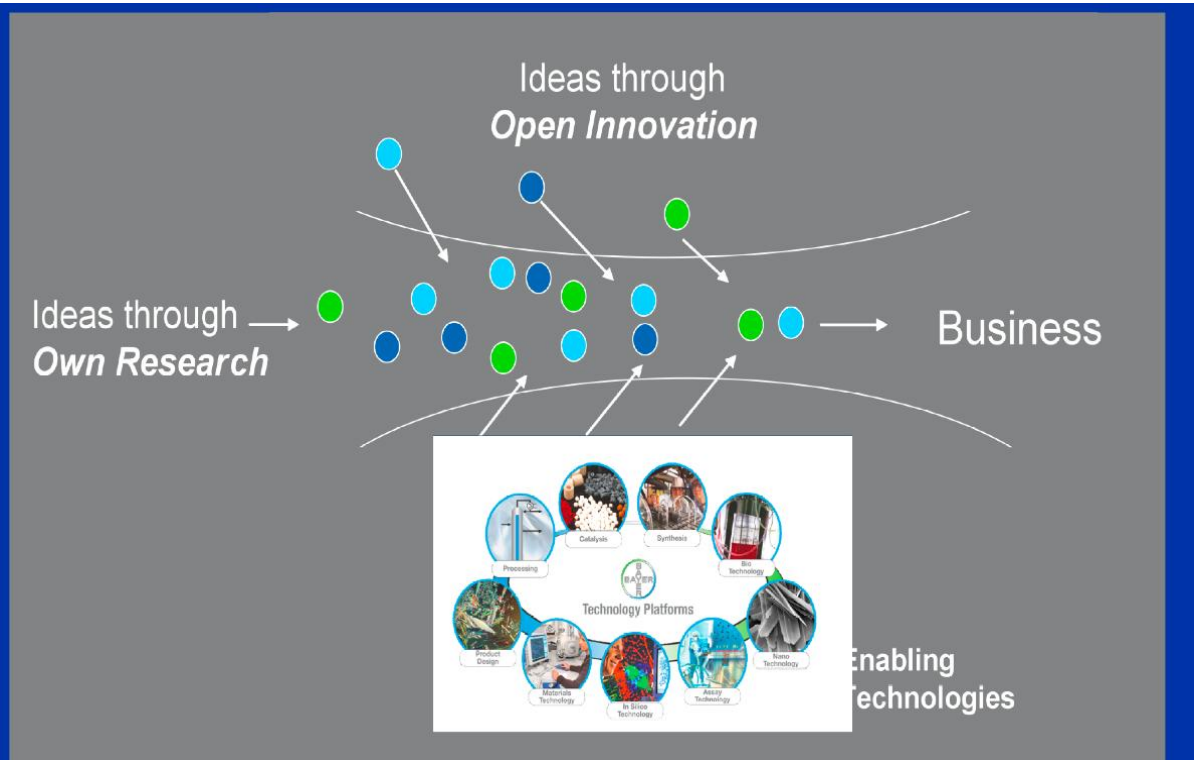
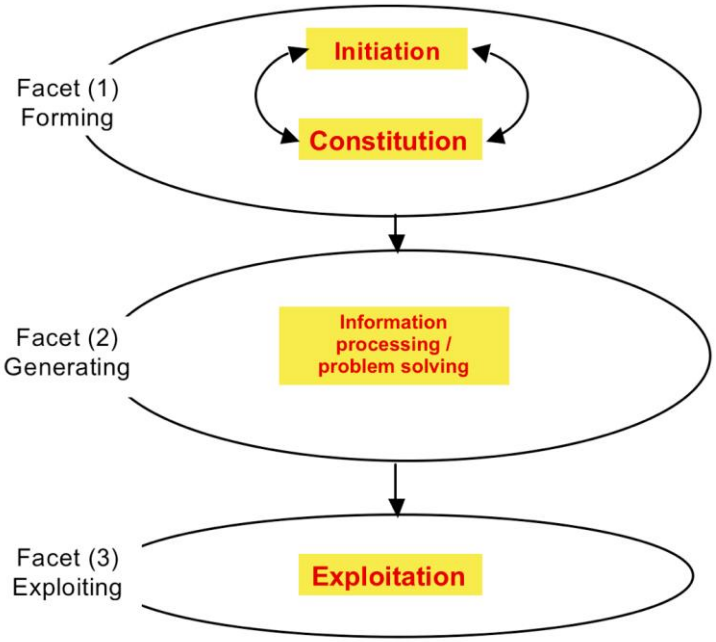
Open Innovation - A Promising Route to Rapid Commercialisation of Nanotechnology in Europe

- … customisable and adaptable *Open Innovation Model and Methodology…*



Source: Bayer Technology Services GmbH



source: RWTH

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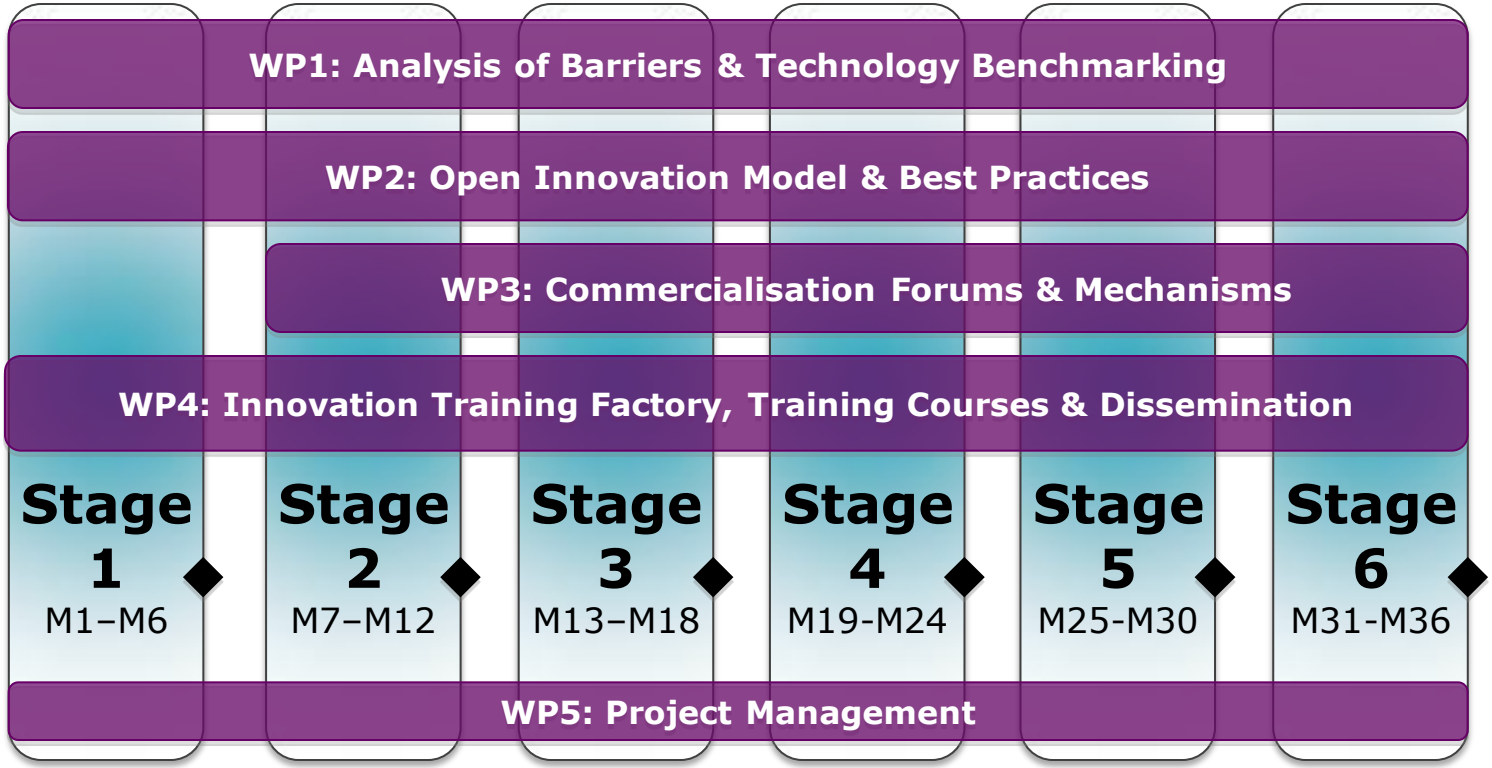
NanoCom Stages



- In line with 6 monthly Industrial Steering Board Meetings (◆)

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Current Focus

- Large scale (target 500 respondents) questionnaire survey
  - Identifying and confirming barriers to commercialisation
  - Collating examples of best practice
- Survey of institutionally funded projects – Benchmarking
- Satellite group definition/focus
- Collaboration with and support for NANOfutures

Questionnaire

- Objective: identify and rank both the main barriers to commercialisation and the success factors for commercialisation within the nanotechnology field.
- 500+ responses expected
- Barriers: to identify and investigate the most significant barriers an organisation faces in all nanotechnology related activities.
- Success Indicators: to better understand the types of business related effects resulting from successful nanotechnology activities.
- Success Factors: to gain an insight into the key building blocks, criteria and associated success factors for what organisations consider to be their most successful nanotechnology related activities.

Key Outcomes (1)

- New integrated approach and environment to support rapid commercialisation of European nano-technology research;
- Blueprint and pilot of a European platform for open innovation in the nanotechnology domain achieving significantly faster industrial commercialisation of research results by up to 25%;
- Aim for an increase of 25% of private investments and support for young companies (start-ups, spin-offs) to raise funding for innovation via an investment forum (Dragons' den).

Key Outcomes (2)

- Increase the return-of-investment in nanotechnology research by up to 30% by providing support for accurate commercialisation readiness assessment and decision making;

- Support for the transfer of knowledge from university to industrial production and the market by creating a network of regional clusters and SME's international alliances;

- Doubling Europe's patent productivity in nanotechnology by overcoming the problems of identifying the commercial potential of research and better aligning nano-research with industrial needs.

Key Outcomes (3)

- Nano-Innovation Training Factory;
- Contribution to the implementation of the EC's Action Plan for Nanotechnology;
- Providing recommendations for future appropriate measures to stimulate investment and spread best practices for research and rapid commercialisation of next generation nanotechnology based products.
- NanoCom together with ProNano and others will contribute and disseminate through NANOfutures

Any Questions?

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