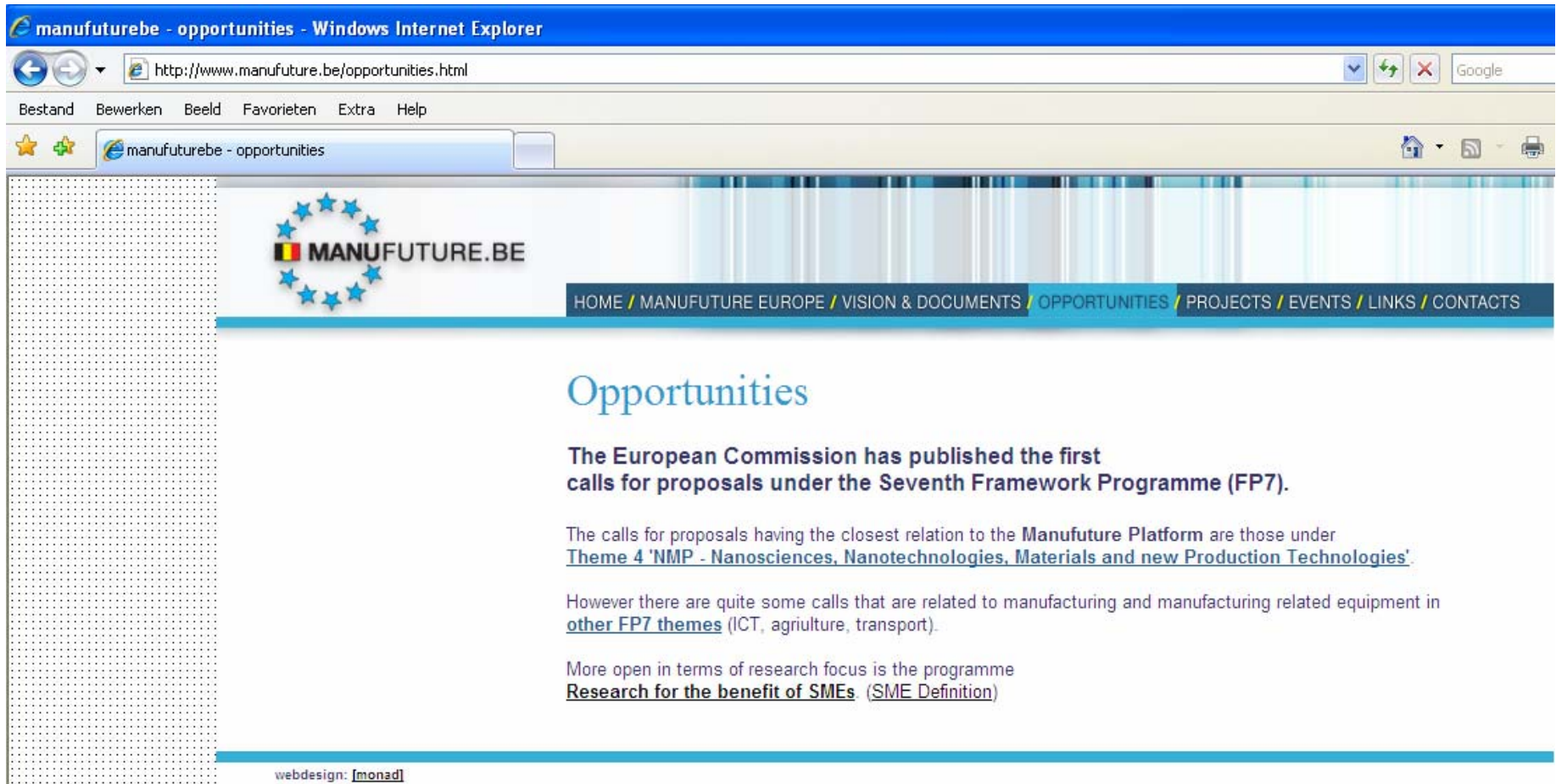




Themes and Calls for proposals

Chris Decubber
AGORIA



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Opportunities

The European Commission has published the first calls for proposals under the Seventh Framework Programme (FP7).

The calls for proposals having the closest relation to the **Manufuture Platform** are those under **Theme 4 'NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies'**.

However there are quite some calls that are related to manufacturing and manufacturing related equipment in **other FP7 themes** (ICT, agriculture, transport).

More open in terms of research focus is the programme **Research for the benefit of SMEs**. (SME Definition)

webdesign: [monad](#)



COOPERATION	Health	IDEAS	European Research Council
	Food, agriculture and biotechnology	PEOPLE	Initial training
	Information and communication technologies		Life-long training
	Nanosciences, nanotechnologies, materials and new production technologies		Industry-academia
	Energy	CAPACITIES	International dimension
	Environment (including climate change)		Specific actions
	Transport (including aeronautics)		Research infrastructures
	Socio-economic sciences and the humanities		Research for the benefit of SMEs
	Security		Regions of Knowledge
	Space		Research potential
	Science in society		
	Coherent development of research policies		
	International co-operation		
	Non-nuclear actions by the Joint Research Centre		

Theme 2: Food, Agriculture and fisheries, Biotechnology

- **KBBE-2007-1-4-03: The farm of tomorrow.** (page 25)
(...) Energy efficient cultivation with light machinery (avoiding soil compaction), precision farming, and robotics are important components, considering special requirements for high value markets, such as organic agriculture/livestock production (...)
- **KBBE-2007-2-3-01: Smart control for improved food and feed technologies.** (page 37)
(...) The aim is to develop robust and reliable quality sensing systems, in combination with computer simulation programmes, for process design, monitoring and control, such as applications of Process Analytical Technology. They should gradually replace ex-post quality control systems taking into account product properties and quality as well as environmental constraints. Scientific trends in technologies will be adequately considered in order to improve the diversity of foods and feeds taking into account the needs of consumers and of small and large industries in terms of applicability. Collaboration of food technologists, sensor and information technology (IT) specialists as well as industrial quality managers is needed. SMEs from the IT and sensor sector should be involved, in particular for the demonstration activities. (...)
- **KBBE-2007-2-3-02: Assessment and improvement of existing food and feed technologies.** (page 37)
(...) Bridging scientific fields for spreading the excellence and for an innovation-driven increase of the competitiveness of food producers and food equipment manufacturers, measurable increase of food safety and quality, reinforcement of consumer trust in food, better informed decisions taken by policy and regulatory bodies. (...)



FP7 ICT Work Programme 2007-08 Challenges

**Call 1-3:
1030
MEUR**

Socio-economic goals

4. Digital
libraries
and
content

5. ICT for
health

6. ICT for
mobility &
sustainable
growth

7. ICT for
independent
living and
inclusion

1. Network and
service
infrastructures

2. Cognitive systems
interaction,
robotics

3. Components,
systems,
engineering

Industry/Tech needs

Future and Emerging
Technologies (FET)



Theme 3: ICT - Information and Communication technologies

- **ICT-2007.1.1: The Network of the Future.** (page 12)
(...) scalability, delivering an order of magnitude increase in the number of connected devices and enabling the emergence of applications that are machine-to-machine or sensor-based - beyond RFID - and are capable of functioning within a multiplicity of public or private operating environments. (...)
- **ICT-2007-1.3: ICT in support of the networked enterprise.** (page 14)
(...) Architectures and platforms for the integrated enterprise supporting massively distributed networked devices, notably enhanced RFID-based systems. Tools and technologies that enable intra-enterprise collaboration and the definition and execution of tasks and workflows for operation across multiple domains. (...)



FP7 ICT Work Programme 2007-08 Challenges

**Call 1-3:
1030
MEUR**

Industry/Tech needs

1. Network and service infrastructures

2. Cognitive systems interaction, robotics

3. Components, systems, engineering

4. Digital libraries and content

5. ICT for health

6. ICT for mobility & sustainable growth

7. ICT for independent living and inclusion

Socio-economic goals

Future and Emerging Technologies (FET)



Theme 3: ICT - Information and Communication technologies

- **ICT-2007.2.1 (ICT-2007.2.2): Cognitive Systems, Interaction, Robotics.** (page 21)
(...)
 - a) **Artificial systems that fulfil one or both of the following requirements:**
 - they can achieve general goals in a largely unsupervised way, and persevere under adverse or uncertain conditions; adapt, within reasonable constraints, to changing service and performance requirements, without the need for external re-programming, re-configuring, or re-adjusting.
 - they communicate and co-operate with people or each other, based on a wellgrounded understanding of the objects, events and processes in their environment, and their own situation, competences and knowledge. (...)
(...)

Theme 3: ICT - Information and Communication technologies

- **ICT-2007.2.1 (ICT-2007.2.2): Cognitive Systems, Interaction, Robotics.** (page 21)
 - a) **Artificial systems**
 - ***Robots handling, individually or jointly, tangible objects of different shapes and sizes***, and operating either fully autonomously (as for instance in difficult terrains with a need for robust locomotion, navigation and obstacle avoidance) or in co-operation with people in complex, dynamic spatial environments (e.g. domestic environments).
 - ***Robots, sensor networks and other artificial systems, monitoring and controlling material and informational processes*** e.g. in industrial manufacturing or public services domains. This may include information gathering and interpretation in real-time emergency or hazardous situations (e.g. through multi-sensory data-fusion) or in virtual spaces related to real world objects and people.
 - ***Intuitive multimodal interfaces and interpersonal communication systems*** providing personalised interactivity in real-world and virtual environments, based on improved human interaction modelling and understanding of contextually-referred communication, for example, by signs and signals in all modes (such as sound, vision, touch) and modalities (such as natural language, both spoken and written), through autonomous adaptation and by addressing user needs, intentions and emotions.

Theme 3: ICT - Information and Communication technologies

- **ICT-2007.2.1 (ICT-2007.2.2): Cognitive Systems, Interaction, Robotics.**
(page 21)

(...)

a) Artificial systems

Work proposed in any of these areas should, as appropriate:

- develop and apply engineering approaches that cater for real-time requirements (if present) and systems modularity, and ensure the reliability, flexibility, robustness, scalability and, where relevant, also the safety of the resulting systems; and develop criteria for benchmarking these properties;
- contribute to the theory and application of learning in artificial systems, tackling issues related to the purposive and largely autonomous interpretation of sensor-generated data arising in different environments, and to novel design and implementation principles of pertinent systems architectures.
- explore and validate the use of:
 - advanced sensor, actuator, memory and control elements, components and platforms, based on new, possibly bio-mimetic, materials and hardware designs – e.g. for the realisation of systems with greater structural and functional diversity and modularity,
 - new, possibly bio-inspired, information-processing paradigms, and of models of natural cognition (including human mental and linguistic development), adaptation, self-organisation, and emergence; and take account of the role of systems embodiment and affordances.
 - new ways of combining statistical, knowledge driven and cognitive approaches to language understanding, generation, and translation by machines.

Theme 3: ICT - Information and Communication technologies

- **ICT-2007.2.1 (ICT-2007.2.2): Cognitive Systems, Interaction, Robotics.** (page 21)
 - b) A principled approach to structuring research in relevant areas, addressing in particular learning in artificial systems, the requirements for cognitive capacities of robotic, interactive and language support systems, and including the development of experimental scenarios, the development or construction of resources for experimentation, and the development of performance metrics and definitions of autonomy levels for artificial systems.



FP7 ICT Work Programme 2007-08 Challenges

**Call 1-3:
1030
MEUR**

Industry/Tech needs

1. Network and service infrastructures

2. Cognitive systems interaction, robotics

3. Components, systems, engineering

4. Digital libraries and content

5. ICT for health

6. ICT for mobility & sustainable growth

7. ICT for independent living and inclusion

Socio-economic goals

Future and Emerging Technologies (FET)



Theme 3: ICT - Information and Communication technologies

- **ICT-2007.3.1: Next-Generation Nanoelectronics Components and Electronics Integration.** (page 24)
(...) 3. Manufacturing technologies for: reliable, cost effective industrial manufacturing of sub-45 nm chips; SoC and SiP processes; flexible, automated, adaptive, on-demand and short cycle time manufacturing under economically favourable conditions. (...)
- **ICT-2007.3.2: Organic and large-area electronics, visualisation and display systems** (page 26)
(...) Support measures will include access to advanced manufacturing and design competences, training and education for organic and large area electronics, joint user assessment of prototype equipment from European suppliers and will develop synergies between the electronics and the printing sectors on circuit design, manufacturing equipment and standardisation.(...)
- **ICT-2007.3.5: Photonic components and subsystems** (page 31)
- **ICT-2007.3.6: Micro/nanosystems** (page 30)
(...) From smart systems to viable products: Advanced microsystems manufacturing technologies for the whole value chain (design, materials, processes, micro-/nano-scale devices, packaging testing and reliability) with a focus on cost-effective sensor/actuator and system integration technologies, supported by alternative fabrication and testing processes for short time-to-markets. Pre-industrial validation of new manufacturing concepts suitable for large-scale production will also be addressed.(...)

Theme 3: ICT - Information and Communication technologies

- **ICT-2007.3.7: Networked Embedded and Control Systems** (page 32)
(...)
Cooperating objects and Wireless Sensor Networks
(...)
Control of large-scale complex distributed systems: New engineering approaches that ensure efficient, robust, predictable, safe and secure behaviour for manufacturing and process plants and for large scale infrastructures such as distributed energy production, energy distribution, airports or seaports etc. Key challenges include (1) developing generic modelling and design methods, dynamically reconfiguring architectures, languages and scalable algorithms for the control of evolvable, distributed and adaptable systems; (2) mastering complexity, temporal and spatial uncertainties such as delays and bandwidth in communications and node availability; and (3) integrating advances in sensor networks for closing the control loop.

Theme 3: ICT - Information and Communication technologies

- **ICT-2007.8.5: FET proactive 5: Embodied Intelligence** (page 60)
(...) Projects will aim to demonstrate advantages in physical and performance characteristics of the robot e.g. in terms of control, weight, flexibility, resilience, or other characteristics. (...)



COOPERATION	Health	IDEAS	European Research Council
	Food, agriculture and biotechnology	PEOPLE	Initial training
	Information and communication technologies		Life-long training
	Nanosciences, nanotechnologies, materials and new production technologies		Industry-academia
	Energy	CAPACITIES	International dimension
	Environment (including climate change)		Specific actions
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	Socio-economic sciences and the humanities		Research for the benefit of SMEs
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	Space		Research potential
	Science in society		
	Coherent development of research policies		
	International co-operation		
	Non-nuclear actions by the Joint Research Centre		

7th Framework Programme 2007-2013



Building the Europe of knowledge

Theme 4

N s & N t

Materials

Production

Integration for Industrial
Transformation

3. New Production

Objective:

Create continuously innovating production capabilities to achieve leadership in industrial products & processes in the global marketplace



Holistic approach to Knowledge Based Factories

Development and validation of new industrial models and strategies *is about...*

*improving the operations efficiency of a **factory** through new production models and systems integration*

Adaptive production systems *is about...*

*enhancing the **production system** performance within a factory through holistic manufacturing engineering concepts*

Networked production *is about...*

*enabling customer-oriented and cost-efficient manufacturing operations within **dynamic networks** of companies*

Rapid transfer and integration of new technologies into the design and operation of manufacturing processes *is about...*

*development of **knowledge based engineering** capacities drawing on in-depth understanding of the behaviour of machines, processes and systems*

Exploitation of the convergence of technologies *is about...*

*stimulating the creation of **new industries** through application of basic research results in converging technologies*

LARGE

SMALL

Other

Activity 4.3

New Production

4.3.1 Development and validation of new industrial models and strategies (3 topics)

- 4.3.1-1 Beyond Lean Manufacturing – New industrial models for products and process life cycle - LA
- 4.3.1-2 New added-value user-centered products and product services – LA for SMEs
- 4.3.1-3 Integrated risk management in (plants, industrial parks,) industrial systems (and networks) - LA

4.3.2 Adaptive production systems (2 topics)

- 4.3.2-1 Rapidly configurable machines and production systems - SM
- 4.3.2-2 Process intensification in chemicals production - SM

SME

4.3.3 Networked production (1 topic)

- 4.3.3-1 Innovative custom-driven product-service design in a global environment - SM

4.3.4 Rapid transfer and integration of new technologies into the design and operation of manufacturing processes (2 topics)

- 4.3.4-1 Rapid manufacturing concepts for small series industrial production – LA for SMEs

SME

- 4.3.4-2 Innovative pathways in Synthesis – improving efficiency by smart synthesis, design and reduction of the number of reaction steps - SM

4.3.5 Exploitation of the convergence of technologies (2 topics)

- 4.3.5-1 Processes and equipment for high quality industrial production of 3-dimensional nano-surfaces – LA
- 4.3.5-2 Production technologies and equipment for micro-manufacturing - LA

Integration of technologies for industrial applications

Objectives :

Exploit cross-cutting synergies between disciplines, research teams and industries for rapid industrial change.

Towards a **sustainable supply industry** is another key objective in supporting product & productivity innovation, especially for sectors with a large environmental footprint.

Transforming **traditional industry**, which faces the challenge of low-cost competition. It should increase its productivity through new processes, high-added value products and new business models;

Promoting **Science-based Industry** which will play a key role in establishing a high-value European industry.

Fostering **scale-intensive and specialized suppliers industry** through the adoption and integration of new advanced technologies thus enabling the improvement of its leadership in the global market;



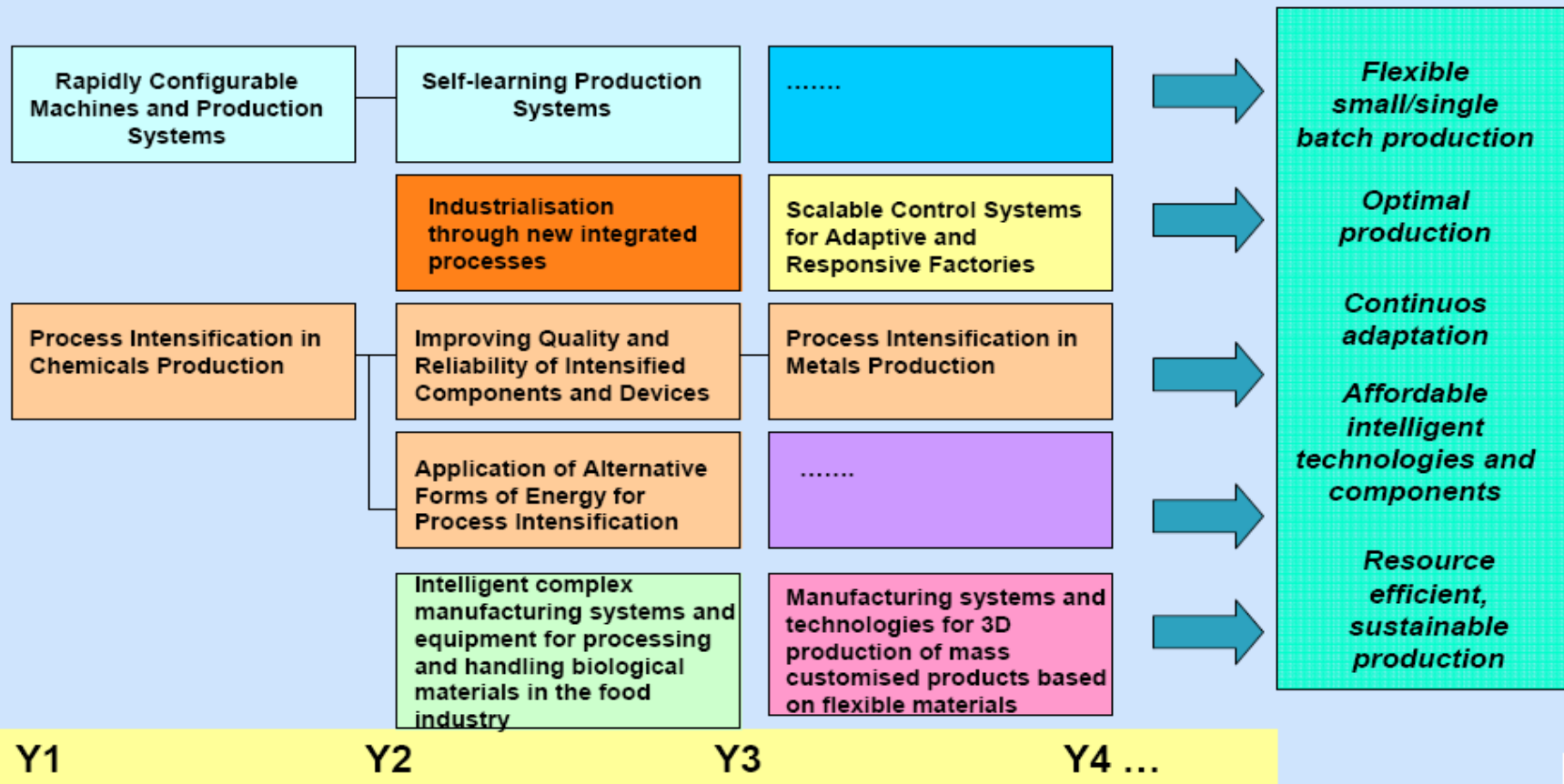
Activity 4.4 Integration of technologies for industrial applications

- 4.4.-1 Advanced wood-based composites and their production - LA
- 4.4.-2 Application of new materials including bio-based fibres in high-added value textile products – LA for SMEs 
- 4.4.-3 Multifunctional materials for the future vehicles – LA
- 4.4.-4 Substantial innovation in the European medical industry:
Development of nanotechnology-based smart multi-tasking targeted agents for diagnosis and therapy (“theranostics”) – LA
- 4.4.-5 Resource efficient and clean buildings – LA
- 4.4.-6 Innovative added-value construction product-services – LA for SMEs 

4.4.-7 ERA-Net on Construction – ERA-net

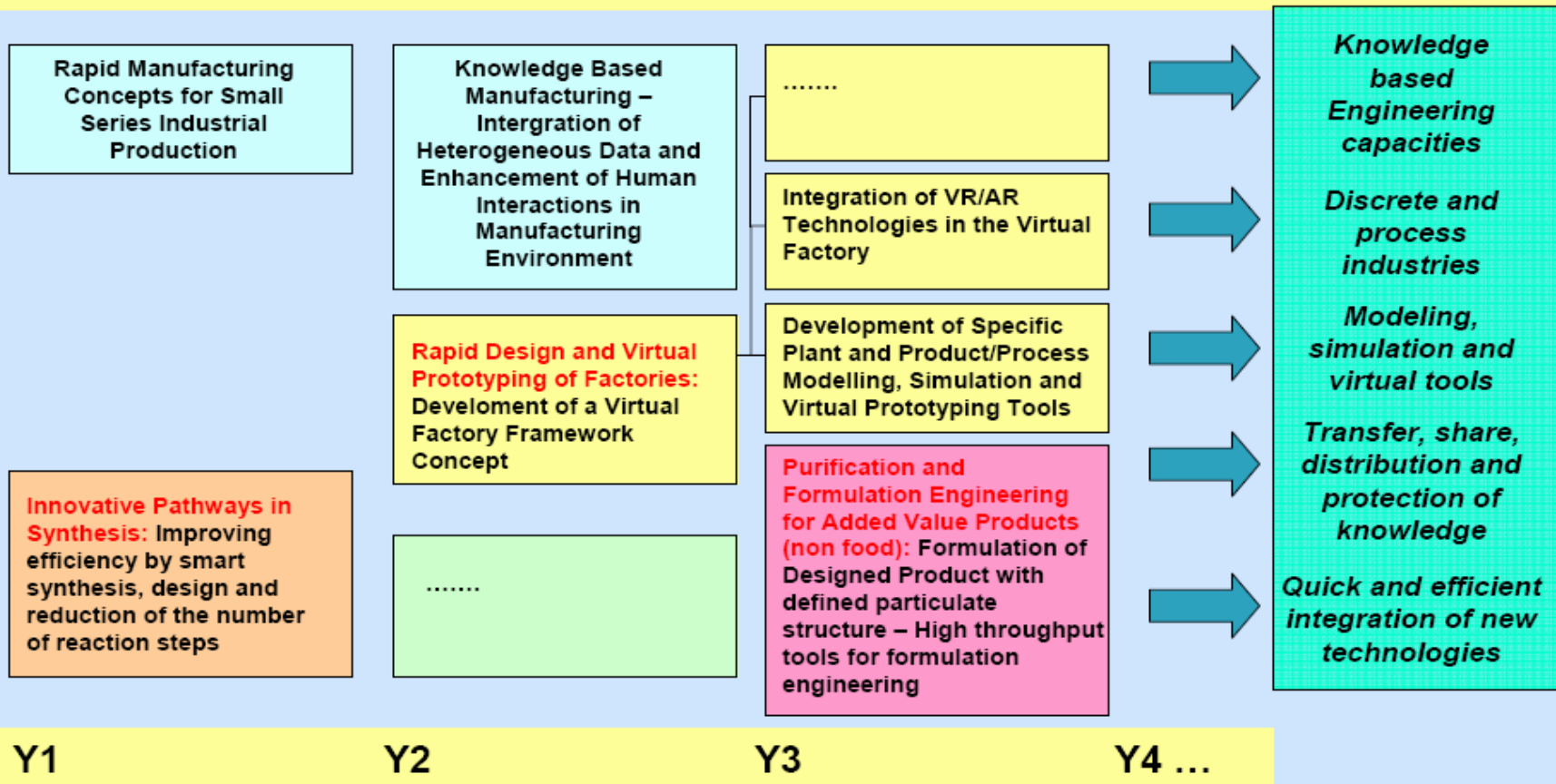
Multi-annual implementation plan

Adaptive Production Systems



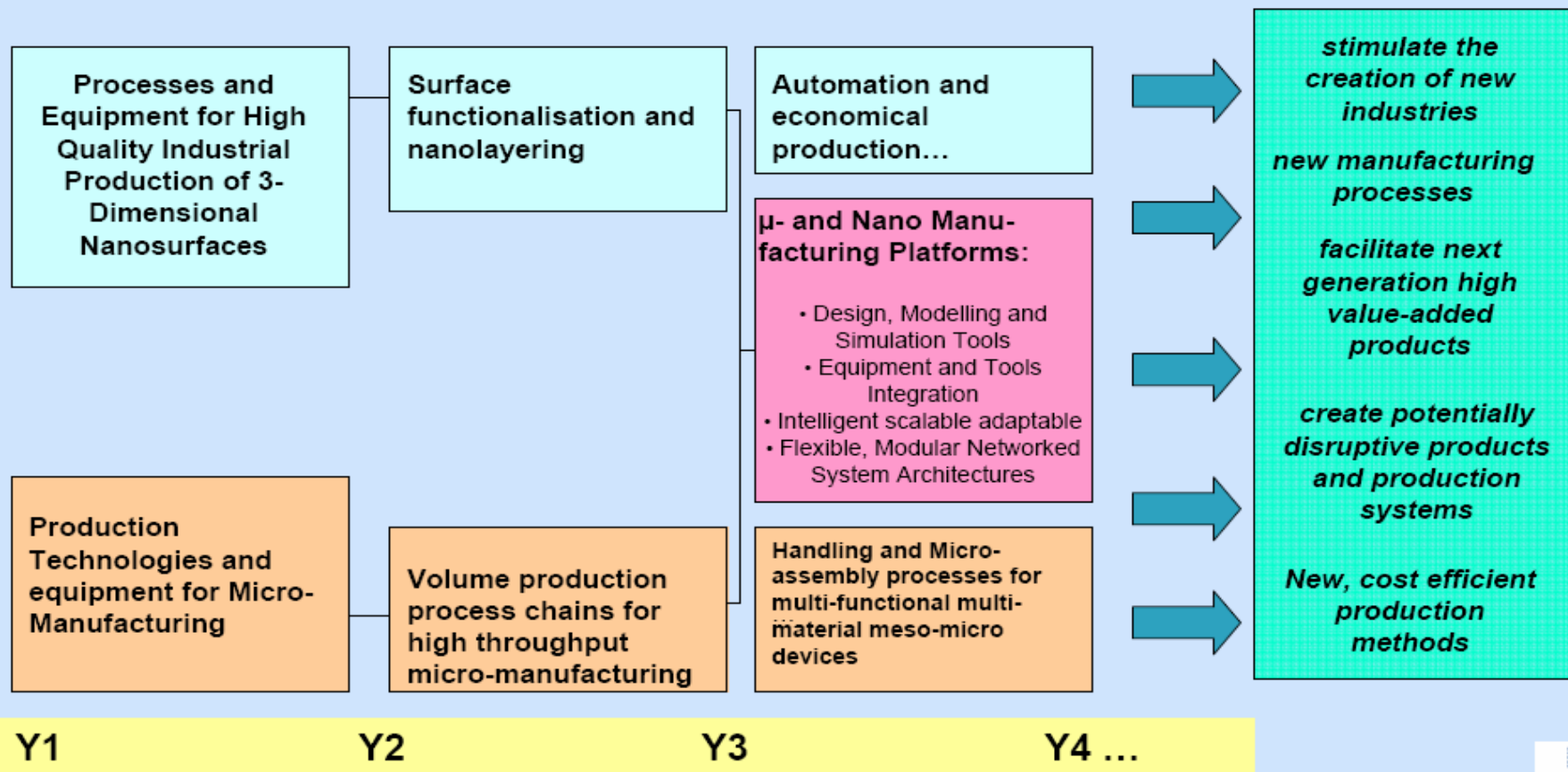
Multi-annual implementation plan

Rapid transfer and integration of new technologies into the design and operation of manufacturing processes: **Knowledge-based Engineering**



Multi-annual implementation plan

Exploiting the convergence of technologies





COOPERATION	Health	IDEAS	European Research Council
	Food, agriculture and biotechnology	PEOPLE	Initial training
	Information and communication technologies		Life-long training
	Nanosciences, nanotechnologies, materials and new production technologies		Industry-academia
	Energy	CAPACITIES	International dimension
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	Socio-economic sciences and the humanities		Research for the benefit of SMEs
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	Science in society		
	Coherent development of research policies		
	International co-operation		
	Non-nuclear actions by the Joint Research Centre		

Theme 7: Transport (including aeronautics) 7.1 AERONAUTICS and AIR TRANSPORT

- **AAT.2007.1.2.1. Production (ACTIVITY 7.1.1 THE GREENING OF AIR TRANSPORT)** (page 17)
(...) Advanced concepts and techniques for the elimination of toxic chemicals and materials and reduction of waste in manufacturing processes; techniques and concepts for increased utilisation of environmentally sustainable materials in aeronautical products. (...)
- **AAT.2007.1.2.2. Maintenance and Disposal (ACTIVITY 7.1.1 THE GREENING OF AIR TRANSPORT)** (page 17)
(...) Advanced concepts and techniques for the elimination of toxic chemicals and materials and reduction of waste in maintenance processes; advanced maintenance and repair techniques for increased re-use of components; concepts and techniques for increasing the life-time of aeronautical products. (...)

Theme 7: Transport (including aeronautics)

7.1 AERONAUTICS and AIR TRANSPORT

- **AAT.2007.4.1.1. Design Systems and Tools (ACTIVITY: 7.1.4 IMPROVING COST EFFICIENCY)** (page 17)
(...) Advanced modelling and simulation tools to include ‘virtual reality’ in support of design and ‘virtual prototyping’; development of advanced computational tools in the fields of structural analysis, computational fluid dynamics, aeroelasticity, aerothermodynamics, icing thermodynamics and multidisciplinary optimisation to exploit state-of-the-art computer technologies; knowledge-based design tools and methods to include integrated life-cycle (design, manufacturing, maintenance, re-use or disposal) product definition; concepts and methodologies for efficient multi-site product development in support of the extended enterprise; methods and tools to support reconfigurable customisation of aircraft cabin architectures and interior designs; advanced testing tools and methods to improve cost-efficiency and reduce testing time of laboratory, on-ground and in-flight tests; advanced concepts and procedures in support of novel approaches to certification of aeronautical products and operations.
(...)

Theme 7: Transport (including aeronautics) 7.1 AERONAUTICS and AIR TRANSPORT

- **AAT.2007.4.1.3. Systems and Equipment (ACTIVITY: 7.1.4 IMPROVING COST EFFICIENCY)** (page 29)
(...) Advanced concepts and techniques for higher systems integrations and for simulation of installation environments to enable rapid customisation and industrialisation with low manufacturing and maintenance costs. (...)
- **AAT.2007.4.1.5. Production (ACTIVITY: 7.1.4 IMPROVING COST EFFICIENCY)** (page 29)

Development of advanced ‘intelligent’ knowledge-based manufacturing and assembly processes and technologies with increased degree of automation; advanced manufacturing methods to reduce both recurring and non-recurring costs across whole production cycle, from single component manufacturing process to assembly including techniques to repair and re-use key components; development techniques for increased flexible tooling; advanced in-process inspection and quality control, including knowledge-based diagnosis and prognosis.

Theme 7: Transport (including aeronautics)

7.1 AERONAUTICS and AIR TRANSPORT

- **AAT.2007.4.4.1. Integrated approach to life-cycle based development of aircraft structures (ACTIVITY: 7.1.4 IMPROVING COST EFFICIENCY)** (page 29)
(...) The project should develop a numerical modelling system which provides a step change in integrated virtual design, virtual manufacturing and in-service maintenance and derivatives development so covering the full life-cycle of an aircraft structure. (...)
- **AAT.2007.4.4.3. Integrated approach to health monitoring and non-destructive evaluation of aircraft structures (ACTIVITY: 7.1.4 IMPROVING COST EFFICIENCY)** (page 33)
(...) The work should provide the European aeronautical industry with a platform of more accurate, more efficient and readily operational non destructive testing techniques to monitor the health of structures for aircraft and engines in the view of extending the in-service life of components (i.e. reduce costs) and increase the level of safety. (...)

Theme 7: Transport (including aeronautics) 7.2 SUSTAINABLE SURFACE TRANSPORT

- **Calls under AREA 7.2.1.2 Environment-friendly and efficient industrial processes (ACTIVITY: 7. 2. 1. The greening of surface transport)** (page 58)
(...) The objective is to improve the cleanliness and efficiency of industrial processes specific to transport products and infrastructure. All processes ranging from design, manufacturing, assembly, construction to maintenance and repair will be considered. Research will define and develop end of life strategies for vehicles, vessels and infrastructures. Innovative solutions for rapid interventions in case of transport accidents will be proposed for the protection of marine, coastal and land environments. (...)
- **SST.2007.5.1.2 Cost effective manufacturing and maintenance (ACTIVITY: 7.2.5. STRENGTHENING COMPETITIVENESS)** (page 86)
(...) The processes will be low cost, high quality, reliable, intelligent, flexible and will concern at least one of the following items: manufacturing; assembly; inspection; maintenance; repair. (...)

- **SST.2007.5.1.3 New production organisations and models (ACTIVITY: 7.2.5. STRENGTHENING COMPETITIVENESS)** (page 86)
(...) Innovative organisations and models for the production of high quality and cost effective surface transport products. Consideration will be given to the management of the supply chain which may include new forms of co-operations involving system and component suppliers at different stages of the production or construction processes.
To this aim, time and cost effective as well as harmonised homologation and cross-acceptance criteria along with increased inter-changeability of data, modules and sub-systems (hardware and software) will be addressed for the creation of economies of scale and rapid introduction of technical innovations. Co-operations between public and private entities may be also considered. (...)

More manufacturing under Energy priority



COOPERATION	Health	IDEAS	European Research Council
	Food, agriculture and biotechnology	PEOPLE	Initial training
	Information and communication technologies		Life-long training
	Nanosciences, nanotechnologies, materials and new production technologies		Industry-academia
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AREA ENERGY.1.1: FUEL CELLS

- **Topic ENERGY.2007.1.2.1: New materials and processes for advanced electrolyzers** (page 19)
(...) Research should focus on the development of novel multifunctional, low-cost materials (and the associated manufacturing processes) for their integration in efficient and durable components and sub-systems for the next generation of electrolyzers based on both Proton Exchange Membranes (PEM) and Solid Oxide Electrolysis Cells (SOEC). (...)

AREA ENERGY.2.1: PHOTOVOLTAICS

- **Topic ENERGY.2007.2.1.8: Improved production equipment and cost reduction** (page 25)
(...) The objective of this topic is to reflect on the crucial role of cost reduction played by the production equipment used by the PV manufacturing industry in silicon cells and modules and identifies the need for development and demonstration of new equipment (for instance: systems for high handling yield/high throughput of thin wafers; equipment for novel manufacturing technologies of solar cells) to be put on the market. Cost, efficiency and environmental aspects should be taken in consideration. (...)
- **Topic ENERGY.2007.2.1.9: Innovative/improved PV manufacturing processes** (page 25)
(...) This topic has the objective to develop and demonstrate innovative processes in the PV manufacturing industry to increase yield and reduce costs. (...)

AREA ENERGY.2.3: WIND

- **Topic ENERGY.2007.2.3.1: Development of components and systems for turbines and wind farms** (page 29)
(...) The objective is to develop robust, reliable, cost effective and low-maintenance onshore and offshore wind energy systems which are easy to transport and to install. Issues to be addressed include the development of individual components and aggregate sub-systems (e.g. rotors, drive trains, controls) using advanced materials, design tools and validation models, and the development of innovative manufacturing procedures. (...)
- **Topic ENERGY.2007.2.3.4: Demonstration of large scale systems for on-and off-shore wind farms** (page 25)
(...) The objective is to demonstrate large scale wind energy systems: MW-turbine, tower and foundation, electrical conversion system and wind farm, including interface with grid, and storage systems integrated in the wind power plant. Issues to be addressed are logistics, manufacturing and maintenance strategies, including the related socio-economic and environmental issues. (...)

AREA ENERGY.2.7: HYDRO

- **Topic ENERGY.2007.2.7.1: New or improved hydro components and concepts** (page 34)
(...) Development and laboratory testing of new or improved turbines and other components, including innovative concepts, aiming at increasing efficiency and/or lowering manufacturing costs, independent of their size. Research may also include the development of new design tools.
(...)

AREA ENERGY.8.1: EFFICIENT ENERGY USE IN THE MANUFACTURING INDUSTRY

- **Topic ENERGY.2007.8.1.1: Manufacturing industry: wastes and waste heat recovery and transfer** (page 65)
(...) Development and demonstration of medium to large scale industrial and community waste recovery technologies/systems for energy uses will be supported. Demonstration of innovative material and heat recovery technologies/systems in industrial processes and innovative heat transfer systems, integrated in the different steps of the manufacturing industry energy cycle will also be supported. (...)
- **Topic ENERGY.2007.8.1.2: Manufacturing industry: SMEs energy innovation** (page 66)
(...) Development and demonstration of innovative energy systems in SME manufacturing facilities aiming to reduce the cost and environmental impact of the various processes and maximising the overall energy efficiency and optimizing the use of natural resources. (...)
- **Topic ENERGY.2007.8.1.3: Manufacturing and process industries: Innovative energy efficient industrial processes** (page 66)
(...) Development of new and/or improved industrial processes with substantial energy savings in primary energy and increase in energy efficiency. Research and demonstration of new energy efficient concepts in industrial processes incorporating systems approach in the energy cycle as well as in the materials cycle taking into consideration reduced use of fossil fuels. (...)

The background of the slide is a photograph of a traditional wooden boat with several people on board, navigating through blue water. The boat has a complex wooden frame and is likely a traditional fishing or transport vessel.

Questions... (?)

- Which kind of projects in terms of size, objectives and structure are expected?
- Around which themes can project be submitted for funding?
- How do I decide that participation is beneficial for my organisation?
- How are project proposals established?
- ...



- Next week: all presentations on www.manufuture.be
- Any questions, remarks:
 - Next week: manufuture@agoria.be
(Jos Pinte, Chris Decubber)
 - Peter Ramaekers (WTCM)
 - Umberto Baraldi (CRIF)(All details on www.manufuture.be)
- Any expression of interest, domain of interest:
contact us