



Constructing a Sustainably
Competitive Europe

MANUFUTURE'2007 CONFERENCE

WORKSHOPS WRAP-UP

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Emerging Sectors (WS3)

- New companies in emerging sectors exploit the outcomes of **research investment in leading edge areas**
 - further than economic value, they promote job creation and industrial fabric regeneration
- **Key issues** for these sectors include:
 - high potential research areas and technologies vs lead markets
 - domain specific skills
 - IPR generation and IPR management
 - entrepreneurship and management for business growth (market vs costs in “rockets” and “gazelles”)
 - new funding mechanisms and funding models (risk analysis, funding stages and cash flows)



Emerging Sectors

- Early-stage high-tech companies are supported by few **erratic innovation programs**
 - focused on universities and not on companies
 - internationalization of high-tech companies not supported
- **Experts** capable of evaluating ideas and technologies and also appraising business and management skills **are needed**
 - lack of technical expertise in EU VC
(business expert, marketing manager, financial manager, etc.)
 - start up companies need to evaluate good ideas/products and their related IPR issues with reduced time and costs ... independently from large companies
 - expert intermediaries needed between ideas and VC



Cooperation in **High-Tech Sectors** (WS1)

OEMs do not differentiate on the tools rather on the products – suppliers talking on the technology very closed on the products.

Trust and confidence among partners is essential.

Vertical cooperation is already in place but should be improved towards a win-win cooperation

Horizontal cooperation is more difficult, but:

- mandatory on infrastructure and standardization
- co-opetition models can be adopted, where companies define the areas in which they cooperate and ones in which they compete
- stable networks needed for longer term cooperation and alignment of efforts



Investment in High-Tech Sectors

- People with capacities regarding the main **investment** convince and attract
- Need for large investments
- Risk analysis and ROI become the common language between high-tech companies and banks
- Very short depreciation time for high-tech equipment
 - . change in **regulations** is needed
- New role of public procurement in Europe
 - . regulation should change
- **European Culture** should better accept **risks** and failures in order to foster entrepreneurship



Industry Transformation (WS2)

- There is a need for Transformation, but... It's critical to have a **vision** and then a **strategy** to achieve it
- Transformation is not only technological
- Transformation is a learning process calling for a learning culture
- Incremental approach
- Lack of management
- Process involving research activities is critical for success
- Branding management is crucial



Industry Transformation Trends & Strategies

- Spread subcontracting/outsourcing partners due to product complexity
- Seek for more flexibility and use of state-of-art technology
- Increase cooperation with R&D&I entities
- Mechatronic development and engineering process: adaptive technology
- Plant simulation to handle future new demands
- Transition from provider of machinery to provider of complete factories
- Collaborative networks over the complete supply and value-chain
- New business models to support the life-cycle of being provider of complete factories



Raising RTD Intensity (WS7)

Public Grants for collaborative Research Projects

- reduce bureaucracy / simplify participation (national and EU)
- better matching of priorities between national and EU programmes
- combine national and EU funds
- break the “glass wall” between universities and companies
 - companies’ day-to-day concerns vs the long-term research objectives of academia



Raising RTD Intensity

EIB loans and other risk capital

- EIB loans appear to be an attractive instrument
- good experiences with little administration burden and financial attractiveness
- not very much used and better information about these opportunities would be useful
- industrial associations could be effective information channels



Raising RTD Intensity

RTD Tax incentives

- a very good funding mechanism
- easy to use (low administrative burden)
- fits well the company's management strategy
- where is the direct link between this scheme and high private investment in RTD ?
(e.g. no RTD tax incentives in Finland and Germany)

Raising RTD Intensity

Horizontal issues

- need to create more bridges between universities and industry
- coordinated EU-policies must not lead to additional excessive bureaucracy
- mechanisms are needed to better support start-up companies
- efforts on highly qualified human resources are needed to get talents in the companies



East/West Synergies - Facts (WS8)

	East	West
Employment	lower	higher
Productivity	lower	higher
Wages	lower	higher
Patent application	lower	higher
No.s of students	lower	higher

- Language and culture
- Efficiencies
- Different (and complex) local regulations
- Highly competitive market & aggressive cost increases
- Human resources not well established



East/West Synergies - Market Drivers

- Business opportunities
- European market with critical mass
- Synergies are leveraged
- 'Low cost' supply chain
- Skills base
- Opportunities for collaborative and industrial driven R&D
- Implementation (commercialisation) must be delivered at a regional level



East/West Synergies - Science & Technology

- Eastern Universities work well with Western businesses
- Eastern countries not well experienced in using EC programmes effectively

Recommendations

- Regions to form clear vision, learn from best practices in Europe and implement clusters
- Create and align regional, national and European strategies
- Manufuture may provide brokerage opportunities
- MANUNET network is a good model to involve regions working together



ManuFuture **recomendations for RTD** (WS6)

- Foster the creation of **RTD clusters** at national and/or regional level, creating research and transfer nodes, and integrating OEMs and SMEs into networks.

These can then join and support the creation of clusters at EU level;

- Develop **competence in high-value complex manufacturing** technologies which are unique and difficult replicate outside of Europe;

- Establish regional/local **centres of excellence in manufacturing**, incorporating a Manufuture network of educational and research communities

- Anchor research and innovation on **internal nucleus of company staff** which will then network to access and transfer external competencies.



Manu*Future* **recomendations for Education**

- Reinforce **links between industry and academia**, by establishing joint postgraduate degrees, postgraduate industrial training, life-long learning and industry-driven courses
- Develop **schemes to help to create knowledge-SMEs** able to link with research centres and other small and large enterprises;
- Introduce **new teaching principles** and industry-based case studies that will promote concrete expertise in manufacturing;
- Re-organise educational programmes around **new engineering disciplines** with a high potential impact on EU manufacturing competitiveness.



Manu*Future* Action Plan for Education

Industry agenda

showing their needs to be addressed.

University agenda

describe and advertise their competencies in research and education in similar fashion as tier-1 suppliers.

ManuFUTURE Educational Agenda

Teaching/Learning Factory Educational Program

– similar concept as used in “Serious games” (flight simulators, ...) and in teaching hospitals.

European Engineering Curriculum

(Global Education in Manufacturing initiative example)

ManuFUTURE International School

leading to Masters and PhD qualification in industrial research



Sustainable Manufacturing (WS4)

Sustainable manufacturing can be achieved by a new holistic production system (**European Production System**) which should be based on ... The Lisbon Agenda: economical, environmental and social aspects

- Sustainability and competitiveness are not in contradiction
- Sustainable manufacturing is part of the microeconomic and not part of the macroeconomic system
- Sustainable manufacturing is closely linked with materials and emerging products

Sustainable Manufacturing

A competitive sustainable European Production System has to answer to the following questions

- How can we attract young people in this field (Education) ?
- show the high added value gained over life cycle ?
- label the benefits of sustainable manufacturing ?
- support the development of technical innovations ?
- promote research in this field ?
- integrate it over the whole supply chain ?
- do a better marketing for sustainable manufacturing ?



Sustainable Manufacturing

Recommendation

Implementation of a workgroup “Sustainable Manufacturing”

- Structuring the targets of sustainable manufacturing in different branches of industry
 - resources (air, water, ...)
 - processes
 - products
- Defining precisely the research topics of the (MANU)Future of sustainable manufacturing



ICT for Manufacturing (WS5)

- **ICT is a key factor** for a sustainable and a high added value industry.
- ICT is “**everywhere**”
- **Innovation** is both in embedding electronics in mechanical products than in the organisation of information flows – for design to production/costs - SCM, customization and optimisation of distributed capacities.
- R&D has to answer to **complexity** because it becomes a **competitive advantage** specially for traditional sectors
(more techno in a press than in a boeing...).



ICT for Manufacturing

- Sme's : need to prove quick added value and payback » strong needs for **interoperability along the supply chain**
- Answer to flexibility issues (OEM) to keep the **control of information** within the manufacturing reorganisation processes in the field. Need simplicity/lean – plug in solutions also to reduce costs for suppliers
- **Reduce the risk** of information technologies in the context of globalisation. Mastering the complexity thanks to **standardisation** issues.



ICT for Manufacturing

ICT Technologies - **Missing aspects**

- In fields e.g. aerospace/OEM : how to prepare ICT within outsourcing process?
- Robust planning developments to avoid disturbances.
- Master total life cycle approaches in a virtual environment.
- Synchronisation of digital factory.
- How to validate more and more complex IC models?
- Standards for interfaces – open systems.

ICT for Manufacturing

The role of the **stakeholders**

- Continuous pressure for join calls : NMP & IST – or other initiatives... Need to clarify what ICT for manufacturing is (very broad).
- To adapt R&D “ICT programs for manufacturing” to the different realities of the different typologies of industries ... we saw two very interesting illustrations (agriculture and furniture needs...) but also very different R&D requirements...
- To take ICT issues more into account within all the on coming NMP call topics.

Conference conclusions

- Workshop conclusions
 - will play a major role to the Conference conclusions
 - will be used by *Manufuture*

Thanks to all the moderators and rapporteurs for their voluntary work!

