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Nanotechnologies and nanosciences, knowledge-based multifunctional materials & new production processes and devices

03/01/2006

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Manufuture marches on



At the Manufuture 2005 conference hosted by Rolls Royce in Derby, UK, on 6-7 December, more than 300 interested stakeholders met to exchange views on a consultation version of an ambitious Strategic Research Agenda.

Over 300 representatives of industry, academia, development agencies, national and sectoral technology platforms, and other stakeholder groups met in Derby, UK, on 6-7 December for the *Manufuture* 2005 conference, 'Making it in Europe'. This was the third in a series of annual conferences addressing the need for a concerted research effort to sustain the competitiveness and employment capacity of European manufacturing industry in the globalised economy.

The [Manufuture initiative](#) was officially launched by the European Commission in December 2003 at a conference held in Milan, Italy, with the stated aim of catalysing dialogue on scientific, technological, organisational and industrial issues related to manufacturing. It was triggered by a widespread concern about the intense and growing pressure from overseas competitors. In high-tech fields especially, other developed economies pose the greatest threat. At the same time, manufacturing in more traditional areas is increasingly migrating to low-wage countries such as China and India. And these, too, are rapidly modernising their production methods and enhancing their technological capabilities.

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Expert vision

A first step in combating these challenges was to appoint a High Level Group (HLG) of experts with the mission of framing a common vision of the way ahead in transforming European manufacturing from a resource-intensive to a knowledge-intensive, innovative sector with all the strengths necessary to achieve and maintain global leadership.

This led to publication of the document '[Manufuture – a vision for 2020](#)' at the second gathering – *Manufuture* 2004 – in Enschede, the Netherlands. On this occasion, the participants confirmed their common will to establish a European Technology Platform and produce a Strategic Research Agenda (SRA) as the means of developing the underlying concepts.

The task was entrusted to a support group drawn from within the HLG and coordinated by Prof. Francesco Jovane (ITIA-CNR). Its findings were presented in [draft form](#) as the basis for further discussion at the Derby gathering, to be followed by a two-month consultation period running until 15 February 2006.

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Setting the scene

Day one of the conference commenced under the joint chairmanship of Professors Heinrich Flegel (Director of Production Technology at DaimlerChrysler) and David Williams of Loughborough University. Opening the proceedings, Rolls Royce Director of Engineering and Technology Colin Smith welcomed delegates to the host organisation's magnificent Learning and Career Development Centre, complete with its own heritage museum charting the company's century of history in automotive and aeronautical engineering. He pointed out that Rolls Royce itself offers an excellent example of the recommended *Manufuture* approach, whereby industrial success is based on innovation, quality and added value, rather than on purely cost-based competition – which will be unsustainable in the longer term.

EC Research Commissioner Janez Potocnik underlined the importance of manufacturing activities to Europe, as the source of 75% of EU GDP and 70% of direct and indirect employment. However, he noted that research investment continues to lag behind that of the USA and Japan – and warned that, with continuing stagnation, even China would become more research-intensive than Europe by 2010. "For its part," he added, "the Commission has adopted an action plan '[Investing in Research](#)', which identifies 19 areas in which we and the Member States should act to encourage more investment by private enterprise, through state aid, intellectual property provisions, public procurement and taxation measures. We will look at how we can use the structural funds to drive research and innovation; how to improve SMEs' access to funding; and how to persuade industry and academia to forge stronger links by operating in new networks and clusters."

"*Manufuture* and the other European Technology Platforms now underway are excellent tools that will make FP7 more relevant to industry," added MEP Professor Jerzy Buzek. "They will help pull the effort together to overcome barriers such as language differences and the national division of budgets that are inherent in the EU, but not faced by its major competitors. This will make it possible to build a European Research Area that will enable all Member States to work together in support of the Lisbon Council objectives: the pursuit of continuing competitiveness, sustainable growth, the creation of skilled jobs and the maintenance of social standards."

In a video contribution, Lord Sainsbury, the UK's Parliamentary Under-Secretary of State for Science and Innovation, observed that, while 30% of today's goods are sourced from developing countries, this is likely to rise to 50% within 10 years. With Chinese labour costs currently at 5% of the EU levels, he observed that Europe's only option would be to capitalise on its knowledge and skills in manufacturing through better cooperation to develop leading-edge technologies and seize market opportunities.

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SRA unveiled

Whereas a number of 'vertical' technology- or sector-specific action plans and Technology Platforms have already been established, or are in the course of preparation, *Manufuture's* aim is to go a step further by addressing underlying 'horizontal' approaches applicable across a broad spectrum of industries.

Members of the *Manufuture* HLG explained the measures outlined in the SRA to support this approach. Their presentations focused in particular on the core element: a reference model linking six drivers of industrial transformation to five pillars of action and their associated enabling technologies.

The drivers are identified as:

- ▶ competition, especially from emerging economies;
- ▶ the shortening life cycle of enabling technologies;
- ▶ environmental and sustainability issues;
- ▶ socio-economic environment;
- ▶ regulatory climate; and
- ▶ values and public acceptance.

The competitive and sustainable reaction to these challenges is seen in terms of:

- ▶ new, added-value products and services;
- ▶ new business models;
- ▶ new advanced industrial engineering;
- ▶ new emerging manufacturing science and technologies; and

- ▶ adaptation of existing R&D and education infrastructures to foster world-class manufacturing.

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Global dimension

The second day commenced with plenary sessions chaired by Carlos Costa, Director of Portuguese bank Caixa Geral de Depósitos, and Edward Lambourne, Managing Director of CAD/CAM systems house Delcam. Dr Massimo Mattucci, from Italian automotive systems supplier Comau, emphasised the global dimension, stating that the *Manufuture* objective should not be to create a 'fortress Europe', but rather to secure the most advantageous position possible in a world where the labour divide is inevitably deepening. The globalised economy is a balance of importing and exporting, he argued. By purchasing more low-tech goods from the developing nations, Europe will provide these countries with the income needed to buy the high-added-value goods it can manufacture through continuous innovation and leveraging our strengths in industrial design, engineering and production systems.

Because consumption in the EU is not growing at the same rate as in Asia, domestic markets no longer provide adequate protection for local enterprises – so profits are insufficient for individual businesses to invest adequately in innovation and change. In these circumstances, the trans-national and trans-sectoral research advocated in *Manufuture* offers the best prospect for optimising the use of available material and intellectual resources. The ideal scenario will be to capture the high ground and provide worthwhile jobs for European workers, while continuing to benefit from a supply of low-cost components.

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National platforms springing up

Prof. Edward Chlebus (Wroclaw University of Technology, Poland) informed the audience that Member States are showing a genuine willingness to participate in the initiative. [National Manufuture Platforms](#) have been established in 16 countries to date. These are at various stages of maturity – and eight more are scheduled for imminent start-up.

Their inputs will help to improve understanding of the balance of technological requirements between the old and new members, and thus permit fine-tuning of the overall SRA recommendations. At the same time, open communication channels will facilitate the exchange of experiences, technologies and business models – leading to the emergence of the European Manufacturing Innovation and Research Area (EMIRA) envisaged as an integral component of the ERA.

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Sectoral views

Delegates next divided into five groups for a series of parallel, sectoral workshops held on the premises of prominent companies in the surrounding East Midlands region, which is home to the UK's second largest concentration of manufacturing facilities.

The topics covered were:

- ▶ Aerospace and advanced engineering;
- ▶ Automotive and land transport;
- ▶ Established and process industries;
- ▶ Science-based industries and emerging markets;
- ▶ Manufacturing and information systems.

Each group was invited to comment on the perceived value of the SRA from its own particular viewpoint, to identify and prioritise key targets for manufacturing research, and to define areas in which collaboration with non-European partners might be beneficial.

Feedback from the rapporteurs indicated a general agreement that the SRA provided a generic template for action to transform industry, but that its top-down viewpoint needed to be complemented by bottom-up contributions more closely identifying the specific sectoral needs. Their research priority lists will form an initial feedback into the ongoing consultation process.

Clarification of the means to be adopted for the inclusion and support of SMEs was seen to be a particularly important requirement. Publication of success story examples was proposed as one useful way to show how they could become involved. With regard to collaboration beyond the EU, the groups acknowledged the potential advantage of working with other technology leaders, but sounded a note of caution regarding intellectual property protection. Appropriate measures, they suggested, would be to promote the attractions of Europe as a research partner, and to reinforce the European position by establishing strong standards and regulations.

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Manufuture 2006 scheduled

HLG member Prof. Englebert Westkaemper (Fraunhofer IPA) closed the meeting with the conclusion that *Manufuture* and the SRA had generated a positive response from all sectors of the audience. He reported the proposal to convene a meeting of experts in July 2006, at which roadmaps for the various industrial sectors would be drafted in greater detail. It was also agreed that a *Manufuture* 2006 conference would take place in Finland in October.

