

ITMA 2011 observations –MANUFUTURE and “Factories of the Future” in Europe



Manufacturing continues to be the driving force of the European economy, accounting for around 20% of all jobs. I was particularly interested in the progress of the European Economic Recovery Plan that was launched in December 2009, and that included a number of programs designed to inspire research, development, innovation and investment to assist European Union manufacturing enterprises, in particular SMEs, to adapt to global competitive pressures by improving their technological base.



The enviable, inspiring and heartening program title MANUFUTURE, has a mission to propose, develop and implement a strategy based on research and innovation, capable of speeding up the rate of industrial transformation to high-added-value products, processes and services, securing high-skills employment and winning a major share of world Manufacturing output in the future knowledge-driven economy. The program website can be [found at this link](#).

The "Factories of the Future" is one of the three Public-Private Partnership included in the European Commission's recovery package and which is supported by MANUFUTURE. It consists of a research programme of 1.2 billion Euro to support the manufacturing industry in the development of new enabling technologies for EU manufacturing which have cross-sectoral benefits and contribute to greener production. Achieving continued growth and sustainability, was believed to depend on a long-term shift from cost-based competitive advantage to an approach based on high added value.

The commitment was guided by a strategic roadmap that identified the following four major areas of priority:

- (i) Sustainable manufacturing,
- (ii) ICT-enabled intelligent manufacturing,
- (iii) High performance manufacturing and
- (iv) Exploiting new materials through manufacturing.

To an observer, “Factories of the Future” is a heartening program designed to define what manufacturing will look like in the future and to fortify manufacturing in Europe. The title itself demonstrates a commitment to manufacturing. A copy of the FoF multi annual roadmap can [be found at this link](#).

A number of presentations at the World Textile Summit were effective progress reports against the FoF PPP roadmap. Common to all presentations was the concept of shared knowledge and transparency. It was also described as “managing the value chain by cooperating and co-creating.” An instruction to say goodbye to the “old industrial landscape” also emerged in almost all presentations. The future, it was said to be in key enabling technologies.

In this spirit, the particularly inspiring presentation on the first day by the CEO of Royal Ten Cate, Loek De Vries was titled “Lessons to be learned from the future - how to turn structural change into a competitive edge.” He challenged the audience by saying that the majority of textile-related solutions have yet to be invented and that they will be “key enabling technologies” that will be solutions to tackle societal challenges:

1. Ageing > requires future proof industrial production (robotics)
2. Individualization > requires mass customization, on-demand delivery
3. Globalization > requires durable solutions
4. Urbanization > requires integrated system approach
5. Sustainability > requires technological innovation

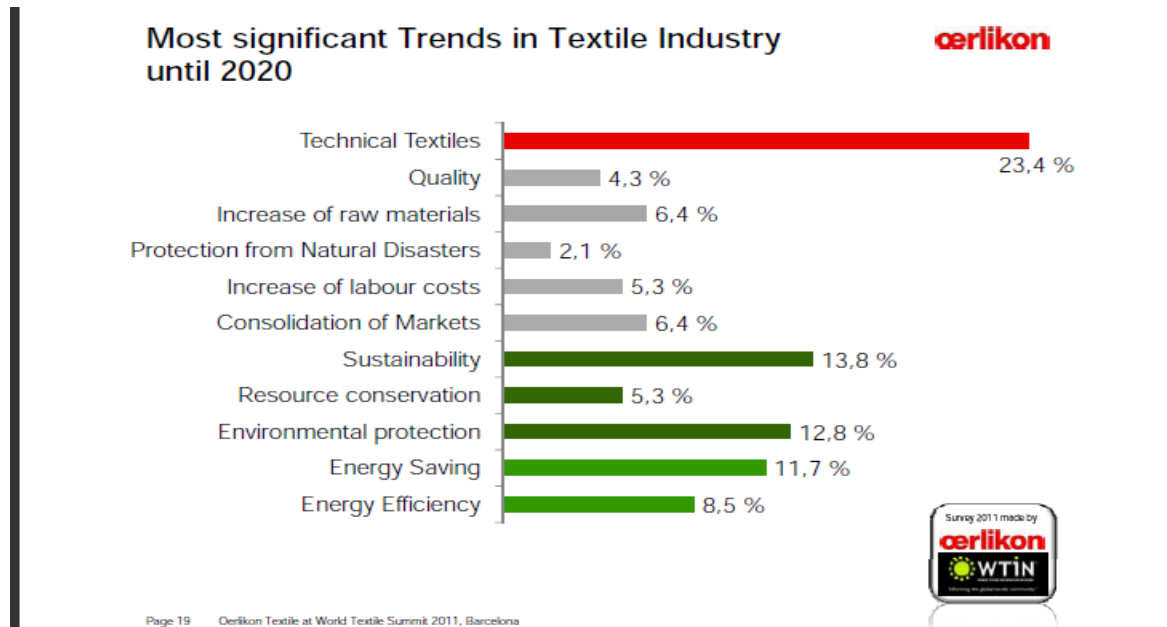
A copy of his presentation can be [found at this link](#).

In an ode to textiles, Thomas Babacan, CEO of Oerlikon described the medium as a “unique basic material with many advantages like second to none flexibility, light weight, thinness, cost efficiency & scale availability, Hence, in contrast to conventional definition, with the development of modern technologies, textile is increasingly to be used as excellent alternatives to basic materials/substrates like constructional materials and metals. It is already the fifth most popular building material after stone, timber, steel and glass.”



Figure 1: Thomas Babacan, CEO of Oerlikon Textile, Kofi Annan, former United Nations Secretary General, Loek De Vries, CEO of Royal Ten Cate

Developing new uses and products for textiles, it was said, does not simply evolve through product development in isolation. It is usually the result of innovative and transparent partnerships across supply chains that have been formed to tackle societal and technological challenges. Business and new product development are now simply being done differently, driven by the concept of shared value creation and liability mitigation. A link to his presentation can [be found here](#).



The end result of these programs and the directions they impose was reflected in the products and machinery at ITMA. The slide above demonstrates that there remains significant impetus behind technical textiles. The FOF roadmap states that the main areas where research is needed to ensure that novel manufacturing processes can efficiently exploit the potential of new materials is in industrial applications.

It further states that: “Traditional and new industries in Europe are working with new materials to take advantage of increased functionality, lower weight, lower environmental burden and energy efficiency. This is needed to achieve a sustainable manufacturing base when moving to high added value products and customised production. New materials pose new challenges for cost efficient manufacturing to shape, handle and assemble complex structures that can involve macro-micro-nano scale, multiple material combinations such as sandwich structures and composites and smart materials involving integration of sensing

and actuation technologies within a material (e.g. smart textiles). In other cases, there is a need to work with bio-inspired materials to integrate them more effectively with conventional and new materials, in order to meet the needs of new bio-industries and environmental targets. Recycled materials are also relevant in this domain, due to their large potential both for cost and environmental impacts.

Most industrial sectors of importance to European manufacturing have a requirement for new and improved processes to deal with the need to exploit new materials through manufacturing. In the transport sector key changes are required to achieve a greater use of light-weight materials, such as composites, and the efficient use of high value added metals, such as high strength steels and nickel based alloys. New composites are also used by industry in the drive towards renewable energy sources, where components need to be manufactured at volumes and costs not previously anticipated, whilst ensuring that waste is minimised. In the textile and footwear sectors new approaches such as 3D shaping and drapability in new automated factories are needed for mass customisation and increased product functionality.

Integration of electronics using improved sensing and control systems, and customisation of smart products (such as in intelligent packaging), also demands new manufacturing methodologies (such as an increased use of laser technologies) and roll-to-roll manufacturing. For the bio-inspired industries, there is a need to incorporate new multifunctional materials into products that span a biological-physical interface and to introduce good manufacturing practices (automation, quality control and traceability) for such products. The use of materials that provide a micro/nano-scale functionality, particularly in volume manufacturing within a safe environment, requires the development of new micro/nano-manufacturing processes that encompass design, assembly, joining and reliability issues (e.g. for new nano-coatings on traditional substrates).

The public-private efforts to support research in these areas will contribute to a successful European strategy for industrial growth in a greener economy.