Mechanical Engineering cluster: MECATECH
Engineering for the future

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Long at the forefront of mechanical engineering excellence, Wallonia is again set to lead Belgium in the field. Whether in developing new technologies or new materials, or simply adding value to existing processes, Walloon companies have the expertise and the will to be market leaders.

The Walloon Region has a long history in mechanical engineering. Monks started digging for coal in Liege around the 12th century, and this led to metalworking. By the beginning of the 17th century, the city was the major exporter of munitions in Europe; highly crafted and precision-engineered shotguns were the product of a true cottage industry in the area. The industrial revolution in continental Europe also had its birth here and the industrial heartland of the German Ruhr owes its heritage to Wallonia. In the 19th century, people in Wallonia were being encouraged to imitate the great industrial city of Birmingham in England - home to the engineering trades and industries in Europe's first industrial economy.

Headed by Pierre Mottet (CEO of IBA), the mechanical engineering cluster has identified four areas of focus: new materials, future services with global technologies, mechatronics and intelligence maintenance.

Today there are 3,000 engineering businesses in Wallonia. In 2004, more than 53,700 people were employed in the industry, which is one-third of the manufacturing industry and a quarter of those employed in the region. This industrial sector is the leading exporter in the region with 73% of its production going abroad. In 2004, the business was worth EUR 7.8 billion and employed around 1,200 engineering researchers. The expenditure on R&D for the Walloon area in mechanical engineering was EUR 590 million in 2004, representing a growth of 75% over five years. In this region there are 1,250 engineering students, including 400 doctoral candidates and a dozen centres of competence.

Of course, engineering covers many areas. This cluster centres on the shared base of mechanical engineering: the science of movement, where balance, force and energy are mobilized to serve its clients – consumers, industries, organizations, functional systems or machines. Engineering is based on the totality of scientific technology and the expertise necessary in the design, manufacture, distribution, maintenance and after-sales stages for products and mechanical processes. The discipline is the crucial factor in fields of application as varied as aviation, transport, medical devices, energy and all state-of-the-art technologies.

Special science-based technologies (i.e. nanotechnology or surface coating) now highlight the mechanical engineering future, which requires scientific knowledge of materials, thixomoulding, electronics, optoelectronics, electricity, information science and even the life sciences. The interaction between science and technology is the dominant theme in mechanical engineering.

Synergetic criteria

The Walloon mechanical engineering cluster, headed by Pierre Mottet, CEO of IBA, which delivers precision solutions in the fields of cancer diagnosis and therapy, decided to use specific criteria to develop the latent and potential synergies in this field to ensure it continued to play its vital role in the region's future.

The first criterion was that there should be prospects for growth. There must be an intrinsic evolution that creates value and employment. There should be broadly applicable technologies. Certain technologies, those that are potentially 'diffusible', with a wide range of applications, are what is required in the engineering cluster.

Expertise also needs to be available in the region. The chances of success will be greater when it is possible to rely on local expertise in order to be active on the world stage. Fortunately, Wallonia has its great tradition in mechanical engineering and the expertise is still there.

A key aspect in the development of the Marshall Plan is to work with players who have shared points of interest and

The projects

The projects include ***Fast 3D****, with a total budget of EUR 9.7 million and 55 new jobs. The focus is on thixomoulding, in which plastic injection moulding processes are used on steel and metal alloys to produce net-shape components.* ***Mirage****, dealing with Arcelor's surface coating, is another project. It provides 450 jobs, has a budget close to EUR 26 million and produces an environment-friendly, anti-microbial surface.* ***Nanocompo****, worth EUR 4.2 million and providing 105 jobs is focusing on nanocomposites and carbon fibre nanotubes.* ***Nanowall****, a EUR 12.4 million project involving 150 jobs is going to develop production lines for nanopowders. It is a future-perfect world with floating powders and clean surfaces.*

The Governing Council of MECATECH

Pierre Mottet, Chairman Mecatech (IBA), J. Pélerin (Arcelor), B. Serin (CMI), M. Miller (Alstom), P; Tenneson (FN Herstal), M. Van der Linden (Caterpillar), P. Fisette (Academy Louvain), P. Wolper (Academy Wallonia-EU), E. Filippi (Academy Wallonia-Brussels), G. Fryns (Centre for the Technology Industry), G. Cuvelier (Biebuyck), R. Kaivers (Automatic Systems), J. Thomas (Metal Inject).

provide potential synergies. The domains can be synergetic and support inter-relationships to develop contacts among businesses with the same specialism, enabling a multiplier effect by virtue of the shared interest. The ultimate goal is to create value and employment in those businesses that cannot move abroad so easily.

Four areas of focus

As a result of the deliberations already outlined, the cluster has identified four areas of particular value as vehicles of both knowledge and employment in the long term. These are fields in which the region has a great deal of expertise and a strong competitive advantage with many businesses prepared to work together. The first phase of the programme will cover new materials and future services with global technologies. The second phase will focus on mechatronics (the synergetic combination of mechanical engineering, electronics and software engineering) and intelligent maintenance.

The process is viewed as a unifying factor and technologies are introduced at various stages in a value chain, leading to the final product. The value chain includes semi-manufactured products, components, calculation and dimensioning, shaping, surface treatment, the assembly and sub-assembly of components, the finished product, after-sales service and the market, and then recycling at the end of the product's life.

For the cluster, the objectives in this process will be:

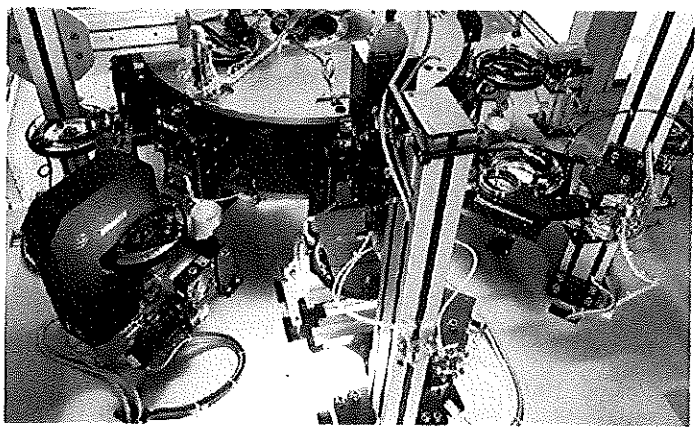
- to play a part in major technological changes with high added value,
- to improve response time, i.e. time to market,
- to rely on assemblers, finished products, new processes and/or services and to develop the number and importance of these,
- to increase the number of technological areas of competence in diffusible and synergetic technologies,
- to increase international activity with a command of international distribution and marketing,
- to lead Walloon players, assemblers, SMEs, specific technologies, universities and centres of research, and develop cooperative initiatives within the network,
- to achieve critical mass in the areas of choice,
- to ensure growth and the creation of employment.

What has been sketched above is the path to future developments. It now depends on those involved in the projects. They include 100 businesses. There are 66 partners in the first phase, including 12 major corporations, 32 SMEs, 14 university departments and 8 research centres. This adds up to 1,000 people; 2,000 new jobs are also forecast and the level of investment is EUR 600,000.

The four areas of focus mentioned above and the two programme phases are already producing interesting developments. New metal alloys, composite thermal plastics and materials, and coverings for nanostructure surfaces are important in terms of the process and rapid prototyping, as is the direct production of metal or polymer parts. Mechatronics plays its role in the control and monitoring of production systems, and sustainability, of course, is always a factor in our environment-conscious age.

On the new material side, Carbon Nanotubes are at the heart of an industrial revolution that affects most of the sectors of concern, including mechanics, optics, pharmaceuticals and information science. There is an initial concentration on the production of Nanopowder. And then secondly there is a technology platform based on nanotechnology for the vertical integration of different players, mastering the areas of nanotechnological development.

The question of materials is vital, with the focus on clean surfaces and hygiene, using rational, sustainable energy with the integration of smart surfaces. Technologies must be global. Thus far, there are 107 project candidates, 6 for phase one, 4 for phase two, 36 were reoriented projects and 61 were not yet ripened. In nanotechnology there are 2 projects with 58 partners. Future surfaces have 1 project with 24 partners, and in global moulding technology there are 3 projects with 22 partners. ‖



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