

PROJECTS 2007-2016

Mechanical engineering

A SECTOR OF EXCELLENCE IN WALLONIA

THE MECATECH POLE IN FIGURES

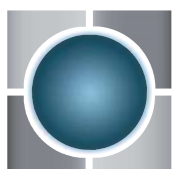
Discover the research projects in mechanical engineering and the implemented investments

DIAGONAL TECHNOLOGIES

Explanation of the processes and testimony of companies exploiting these technologies

NUMERICAL REVOLUTION

Understand the nature and range of the revolution it will generate



MECATECH
CLUSTER

WALLOON COMPETITIVENESS CLUSTER IN MECHANICAL ENGINEERING

GLOSSARY OF PROJECTS







ARX.....	42	MRIPF.....	51
ATAC CONCEPT.....	42	NANOAPPLI.....	51
ATAC-HP.....	43	NANOCOMPO.....	76
BIOAFP.....	54	NANOSOL.....	33, 58, 76
CALFDM.....	69	NANOTECH.....	77
CARMAPHARM.....	63	NEOCERAM.....	66
CARMAT.....	31	OLED.....	34, 58
CASTT.....	43	OPTIGRID.....	34
CITIUS HOUSE.....	54	PCC80.....	35
COMOTEX.....	31	PHOEBUS.....	35
COMPOMAG.....	49	PHOENIX.....	36
COMP2BLADES.....	32, 69	PICABO.....	66
COOLROOF.....	55	POWER.....	36
COSMOZ.....	44	PREMASOL.....	37
DAO.....	55	PROCESS.....	77
DEQUENNE.....	70	PV CZTS.....	37
DOLRE.....	44	PVMAINT.....	38
DRIVE TO CNG.....	45	RABISEAU.....	59
EASYS.....	63	ROMISY.....	78
ECO2ICE.....	70	RPI.....	67
ECOLAS.....	64, 71	SAVE.....	59
ELECTROHOB.....	49	SE.....	78
e-PATCH.....	64	SILENTHALPIC.....	60
FIAMA.....	71	SILICALLOY.....	79
Formation maintenance intelligente.....	72	SOLAR PERFORM.....	38
Formation matériaux.....	72	SOLARCYCLE.....	39
GAC.....	32	SOLAUTARK.....	39
GREEN+.....	56	SOLINOX.....	40
HAVCOAT.....	45, 50	STAGE DES PÔLES.....	79
HIPAC.....	73	SWS.....	52
HOSOMI.....	56	THERMAM.....	80
LED.....	33, 57	THIXOACIER.....	80
LEGOMEDIC.....	65	THIXOWAL.....	81
LIGHTCAR.....	46	TRACTION 2020.....	46
LIONEL.....	65	TRIBOFUTUR.....	47
LORA-SENSE.....	73	ULTRA-CB.....	40
M4.....	50	UPS GREEN.....	60
MAGAL.....	74	VIRTUOSO.....	81
MICROLAB.....	74	VIWI.....	61
MINT.....	75	WHOLETRACK.....	47
MIRAGE.....	57, 75	WIN GTR.....	67

SUMMARY

Cluster Services	4
Perspectives	6
The Mecatech Cluster in figures	8
Priority Markets	11
Focus on Technology	16
They said... ..	20
The Mecatech Cluster Internationally	22
The Circular Economy	25
The Digital Revolution	26

PROJECTS LABELED BY THE MECATECH CLUSTER

28

 Energy & the Environment energy and environmental systems and equipment	30
 Mobility & Transport transport systems and equipment	41
 Defence & Security defence and security systems and equipment	48
 Housing & Construction construction systems and equipment	53
 Healthcare & Well-being medical devices and systems	62
 Industry industrial systems and equipment	68

Contacts	82
Partners	83

CLUSTER SERVICES



INNOVATION PROJECTS

The MecaTech Cluster helps companies develop their projects (research, training, investment, and innovation platforms). It identifies key skills/partners within companies, universities, institutes and academies, and research and skills centres and promotes synergies. It advises project leaders on preparing their application files and helps them navigate through administrative requirements.



NETWORKS

Project leaders have access to an extensive network of industrial, scientific, and training partners. The MecaTech Cluster has also woven close ties with other business organisations (public investment funds called “invests”, incubators, engineering offices, consulting firms, etc.) that it can involve based on company needs.



FINANCING

Wallonia's competitiveness clusters provide access to specific financing. The MecaTech Cluster guides project leaders by providing information about different sources of public financing or by putting them in contact with public/private investors.



INTERNATIONAL

The MecaTech Cluster helps Walloon projects gain an international foothold by identifying foreign partners and financing through its international networks. It provides international visibility by organising and participating in events, trade shows, etc. and promotes relationships with foreign investors (in collaboration with AWEX/OFI).



STRATEGY

The MecaTech Cluster provides project leaders with advice about their growth strategies, whether in connection with their business models, market analyses, and trends in industrial processes.

To achieve this, the Cluster provides access to market study databases, privileged relationships with consulting firms, and a special support programme called "Factory 4.0".



TRAINING

Together with its partners Technifutur, Technocampus, and Campus Automobile, the MecaTech Cluster works on acquiring the skills required to develop and use advanced technologies.

PERSPECTIVES



YVES JONGEN

*Chairman, MecaTech Cluster
and Chief Research Officer, IBA*



JACQUES GERMY

Administrator, ex-CEO, MecaTech Cluster



ANTHONY VAN PUTTE

CEO, MecaTech Cluster

What is the MecaTech Cluster's most important function?

YJ: MecaTech's goal is to increase business activity and employment in the Walloon Region by putting together and implementing projects with international ambitions with the support of networks that bring together large companies, SMEs, universities, and research and skills centres.

Is mechanical engineering a traditional sector?

YJ: Mechanical engineering is a state-of-the-art sector marked by major advances. It involves many fields of application, such as construction, energy, the environment, defence and security, the automotive sector, healthcare, and machines and equipment. It relies today on a very broad range of technologies, such as mechanics, new materials, nanomaterials, additive manufacturing, surface functionalisation, chemistry, mechatronics, big data, the Internet of Things, and now...organic materials, biomimetics, and more.

Why is the concept of the network so important?

JG: The diversity of the technologies and fields of application of mechanical engineering has led to the hybridisation of technologies and disruptive innovations that are essential to current innovation processes. The hybridisation of technologies makes networking a must because even large companies can no longer master all the technologies required to develop these innovations alone. **Networking isn't a fashion; it's an absolute necessity.**

A success, in your opinion?

AVP: Yes. Getting mechanical engineering players in Wallonia to network is a challenge because it involves getting people and entities with very different cultures to work together. It's a success given that over two hundred players are now involved in the projects. In addition, the Cluster has been able to attract high-performance companies, for MecaTech member companies have seen their added value increase by 60%

“ *The Cluster can fully embrace the role the Walloon Government assigned to it, that is, to be a driving force for the entire sector.* ”

over the past ten years, despite the crisis, while the mechanical engineering field as a whole has been stable.

YJ: Which means that the Cluster can fully embrace the role the Walloon Government assigned to it, that is, to be a driving force for the entire sector.

How has this networking helped your projects evolve?

JG: MecaTech's approach to networking has evolved over time. In the beginning, ties developed between the members of a project. As the number of projects and members increased, synergies developed between projects and many players became involved in several projects, creating denser networks. Next, MecaTech built bridges between companies that were from very different industries but had complementary skills.

YJ: For example, to produce its new line of proton therapy machines, IBA worked with Amos (giant telescopes) and the Ateliers de la Meuse (heavy mechanical engineering) because the two companies have expertise in the construction of large, extremely precise mechanical units.

“*Mechanical engineering is a state-of-the-art sector marked by major advances.*”

Does the role of the Competitiveness Clusters also include growing internationally?

JG: Partnerships with foreign clusters and players make it possible to develop international research projects and business flows. The Walloon companies can provide their partners with advanced technology skills as well as know-how in traditional sectors. However, the latter also evolve with

the integration of new technologies and create new opportunities. In addition, Wallonia has a long history of participating in global industry.

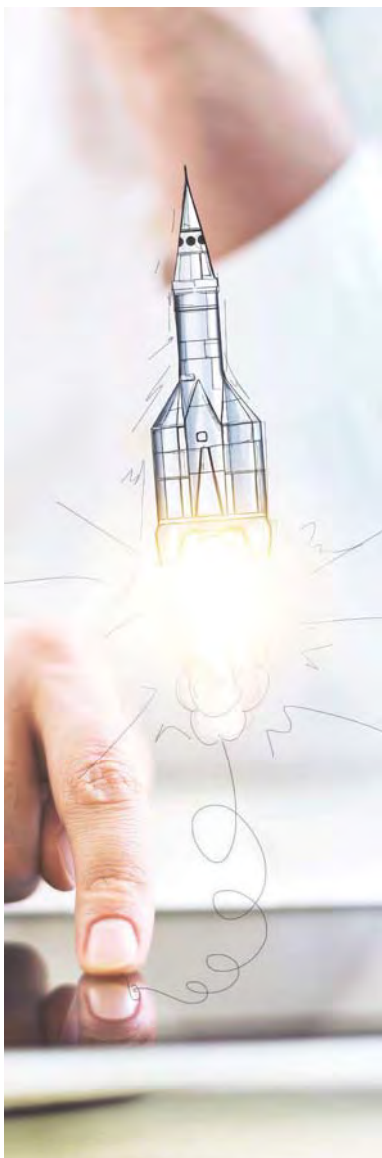
What are the new challenges for the MecaTech Cluster?

AVP: The MecaTech Cluster is focusing on the Walloon Government's two main priorities: the Circular Economy and Digital. The Circular Economy and Functional Economy models have already been introduced into the cluster's approach and the cluster has more and more projects in these two new areas.

Digital is becoming a vital challenge for every company and, this year, the MecaTech Cluster launched the FACTORY 4.0 programme. It's a business diagnostics system that implements action plans to enable companies to improve their performances at every operational level. The ultimate goal is to improve the use of resources and ensure the long-term future of industrial activities in our region.

“*Networking isn't a fashion; it's an absolute necessity.*”

THE MECATECH CLUSTER



MISSIONS

The purpose of the MecaTech Cluster is to increase business and employment by setting up and carrying out innovative projects with international ambitions. To this end, it builds networks of major companies, SMEs, universities, and research and skills centres. The cluster's goal is to be a driving force for the entire mechanical engineering sector.

RESULTS

Nearly ten years after it was created, its network of mechanical engineering players in Wallonia is a success. The cluster has brought together over 300 companies, laboratories, research centres and higher education establishments and around 105 industrial projects.

The participating companies have added value of €905 million, which is half of the industrial sector, excluding the steel industry, and employ close to 10,000 people out of a total of approximately 26,000 in the same sector.

The companies drawn to the MecaTech Cluster are also among the best performers in the mechanical engineering field. They have seen their added value increase by 60% over the past ten years despite the crisis, while growth in the sector overall was about 5%. Their workforce also increased by over 25% at the same time as employment in the sector decreased by 5%. These figures also point to a significant increase in productivity.

“ Driving force:
MecaTech has been
able to attract
high-performance
companies and play
the role of accelerator.

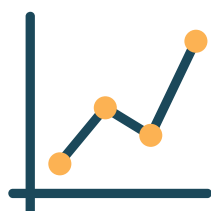


IN FIGURES

Discover the projects approved and implemented in the mechanical engineering field and the investments made.

RESULTS FOR THE FIRST 18 CALLS FOR PROJECTS FROM 2007 TO 2016

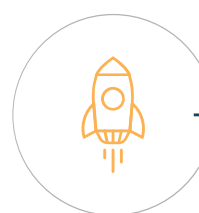
68 research projects, 9 investment projects and 20 training projects involving:



113 SMEs
(180 participations in projects)



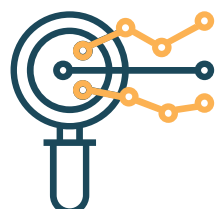
34 major companies
(96)



The growth in the added value of the cluster's companies was 60% above the industry's.



108 university laboratories
(160)



17 research centres
(72)



99 projects were approved for a total investment of €285 million.



9 higher education establishments
(6)



3 skills centres
(22)



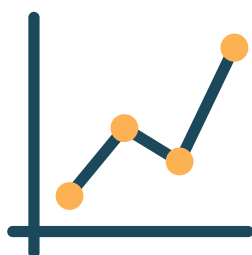
More than 280 members, including 147 companies.



The cluster's companies created 2,140 jobs over the last ten years.

TOTAL

99 projects involving 284 players (536)
not counting subcontractors.



SMES

€114 million, including
€43 million in private investment



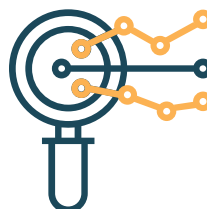
LARGE COMPANIES

€79.5 million, including
€42.3 million in private
investment



UNIVERSITIES

€54.9 million



RESEARCH CENTRES

€25.5 million of which
€7.82 million in private
investment



HAUTES ECOLES

€1.2 million



SKILLS CENTRES

€9.8 million, including
€1.2 million in private
investment

TOTAL

Investment: €285 million, including
€94.3 million in private investment

3 innovation platforms for
a total investment of €90.1 million

PRIORITY MARKETS



Mechanical engineering is a transverse field that has applications in most industries, ranging from consumer products (automotive, household appliances, etc.) to healthcare, with machines and industrial processes in between. It is a field of knowledge that encompasses the entire product/equipment life cycle, from design to manufacturing, maintenance, and finally recycling.

Over the years, expertise in the sector has become concentrated on six priority markets for which the Meca-Tech Cluster companies provide products, services, and industrial machinery.

priority
markets

HEALTHCARE & WELL-BEING

MEDICAL DEVICES AND SYSTEMS

Wallonia is a breeding ground for innovative companies in the medical devices and systems fields, which are among the healthcare sector's main areas of growth. The sector is special in that it is at the crossroads of engineering and health. This combination of skills has led to the development of a wide variety of products ranging from consumables to implantables, with medical devices, diagnostic tools (with or without machines), and medical instruments (including imaging) in between.

Some major trends:

- ▶ Growth in the use of digital technologies such as information sharing between medical devices and ICT applications/networks
- ▶ New materials and engineering to develop medical devices that meet our new healthcare needs (miniaturisation, biocompatibility, etc.)
- ▶ Convergence between medical devices and the pharmaceutical world to go beyond the current limitations of either injectable or ingested medication.



“ *Mechanical engineering is a transverse field with applications in almost every field of activity.* ”

HOUSING & CONSTRUCTION

CONSTRUCTION SYSTEMS AND EQUIPMENT

Construction is a key industry in Belgium. It embraces a multitude of different trades and employs a large number of workers in both the design and building of housing. It thus plays a major role in the economy.

The “Smart Building” concept has recently come to the fore. As the term intimates, a smart building is a sustainable, energy-efficient structure that is connected to other buildings and infrastructure all anchored in their environment.

We also talk about “Smart Cities”. The smart city uses information and communication technologies (ICT) to improve the quality of urban services and/or cut their cost.

A few major trends in housing and construction:

- ▶ Thermal insulation and heating systems (essential to meet the challenges of energy efficiency in buildings)
- ▶ Building industrialisation techniques (to build faster and more inexpensively)
- ▶ The Internet of Things (IoT) via building automation and predictive maintenance.



ENERGY & THE ENVIRONMENT

ENERGY AND ENVIRONMENTAL SYSTEMS AND EQUIPMENT

Energy production and storage systems and equipment require a wide spectrum of mechanical engineering skills regardless of the energy source: wind, photovoltaic hydraulic, etc. Managing these renewable energies presents many challenges for which mechanical engineering companies develop solutions (smart grids, micro grids, etc.). Managing the environment and, in particular, recycling materials also requires significant mechanical engineering know-how, whether to extract, process, or transform recycled materials.

Some major trends:

- ▶ The Circular Economy as a business model
- ▶ Micro-grids and local energy management
- ▶ Reverse Metallurgy.



MOBILITY & TRANSPORT

TRANSPORT SYSTEMS AND EQUIPMENT

Mechanical engineering is involved in all land transport systems including cars, buses, coaches, lorries, and trains, as well as in maritime and air transport. So, the technology fields range from mechanics to information systems, from the development of materials to digital simulation. The sector's main challenges include sustainable development and finding solutions that meet concerns about pollution and energy consumption.

Some trends:

- ▶ Electric vehicles
- ▶ Alternative fuel vehicles (gas-powered, etc.)
- ▶ Lighter vehicles
- ▶ Connected vehicles
- ▶ Autonomy



DEFENCE AND SECURITY

DEFENCE AND SECURITY SYSTEMS AND EQUIPMENT

Wallonia has a long-standing tradition in the defence industry, with over forty companies active in the sector, including several world leaders. The security field encourages the emergence of specific technologies, notably in the area of military technology, that can later be adapted for civilian use. The concomitant development of military and civilian products is common, especially as certain companies work both on military and on civilian security. ICT is playing an increasingly important role in both civilian and military security. Examples are virtual and augmented reality, artificial intelligence and behavioural analysis, sensors, robotics, new materials, etc.



“ Industry must constantly improve its products and production processes.

INDUSTRY

INDUSTRIAL SYSTEMS AND EQUIPMENT

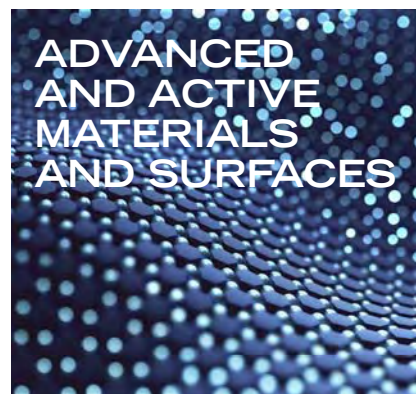
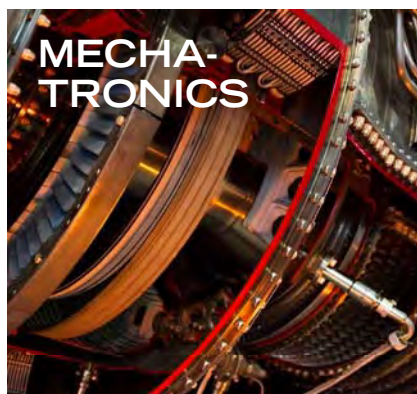
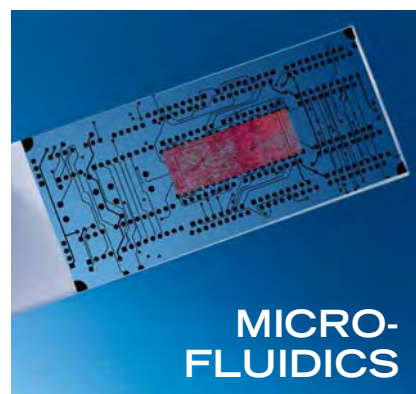
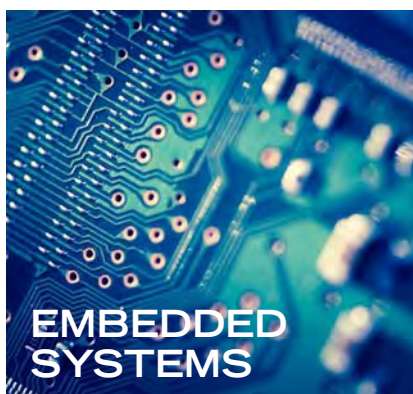
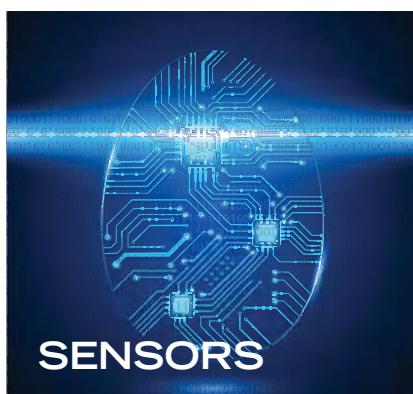
Industry must constantly improve its products and production processes. Industry 4.0, which is being compared to a new industrial revolution, further highlights the importance of advanced technology systems and equipment in meeting this challenge.

The major trends in the sector are:

- ▶ Digital: Intelligent, interconnected systems are now integrated transparently in activities throughout the value chain.
- ▶ Robotics: Mechatronic innovations in components – actuators and advances in interfacing and control software, etc. – increase the performances of industrial robots, making them more precise, faster and more robust. The goal is to increase productivity.
- ▶ Predictive maintenance, which prevents breakdowns and provides the information required to take decisions quickly.



FOCUS ON TECHNOLOGY



THREE COMPANY TESTIMONIALS:



NRB TESTIMONIAL

JACQUES WIECZOREK,
BI/ANALYTICS SOLUTION MANAGER

How would you describe the influence of Big Data on companies today?

The influence of Big Data on companies is growing. Companies understand that managing the immense thesaurus in their possession, combined with external data, provides fantastic potential leverage for growth and/or more competitive positioning in the marketplace.

In addition, Big Data will enable them to move from an economic model based on the organisation (What can I sell to my customers? Which products, which services?) to an economic model focused on the customer (What do my customers need? How can I help them? What will they be willing to pay?).

What impact does that have?

Big Data can affect a company's strategy in three ways:

► Making no change in strategic activities.

The company isn't subject to disruptive activities, nor is its ecosystem, which shows no signs of porosity.

Big Data will provide a competitive advantage in areas in which innovation generates massive amounts of data (connected objects, sensors, digital machines, etc.), technology watch, etc.

► Orientating your digital strategy

Big Data will enable the company to remain competitive and become a component of its digital strategy. Big Data creates new prospects when it comes to marketing, optimising processes, and lowering operating costs.

► Changing your strategic direction

Big Data has a significant impact on the company's business model, ecosystem, and organisational model.

Big Data supports the convergence of physical and virtual activities in the company. It enriches the customer experience and is a source of new business models.

What challenges must be met?

The main challenge is the real added value that Big Data can provide. This can be summarised in three sentences:

- What is the question I want to answer using Big Data?
- Do I have the data I need to answer this question?
- If I get an answer, what can I do with it?

NRB operates the Walloon Big Data platform financed by the Walloon Government. The objectives of this platform are the creation of a high-performance infrastructure that meets the needs of users, processing algorithms and calculations, business line data models that enable advanced analysis, and visualisation tools that provide users with a real value lever to turn data into information and knowledge.

The expected results include the creation of a catalogue of innovative Big Data services based on the data value chain and analytical packages covering creation, collection, storage, processing, analysis, and visualisation.



CITIUS TESTIMONIAL

GREGORY REICHLING,
CEO, CITIUS ENGINEERING



What are the challenges of automation for industry?

In a globalised economy, competition between companies takes place at the global level. Given this context, Belgian companies must deal with very high productivity costs compared with their competitors. Automation is a way to optimise production costs, maximise performance, and improve product quality. While in the short term the sector appears to threaten industrial jobs, there are some studies showing that countries that opted for robotization are seeing their unemployment rates decline over the long term.

What is the outlook for the future?

The automation industry is coping with high demand at this point in time and its prospects look promising. Certain federations, such as Agoria, are encouraging Belgian companies to choose automation and are promoting flexible production suited to short time-frames and the specific needs of each customer. Many Belgian companies have been able to position themselves as world leaders thanks to their use of automation and robots. Some of them, which had previously chosen to outsource their production to countries in which wage costs are lower, are bringing their manufacturing operations back home. Industry continues to be the

leading source of export revenue in central Europe. Automation will enable an entire economy to continue to develop and prosper.

What is your role in the Microlab project?

The Microlab consortium wants to develop a new solution for implementing microfluidic chips. In order to design a technologically complete demonstrator, the partners first wanted to integrate automation. Citius is an engineering firm specialised in electromechanics and mechatronics. It will develop the unit to transfer a laser micro-machined plate to the laser welding area, where a second polymer plate will be positioned and the two welded together. In addition, Citius will be responsible for building the pressure system required for the laser welding unit. It is essential that the two polymers to be welded should be under uniform pressure to ensure a high-quality weld.



I-CARE TESTIMONIAL

FABRICE BRION,
CEO

How mature are the IoT and connected objects?

Connected objects are maturing. Over the past few years, the market has moved from the geek user stage to the early adopter stage. Most industries are currently early adopters.

What impact has the IoT had on your company?

I-Care was created in 2004 as a predictive maintenance company focused on the analysis of vibrations and lubricants. We were among the first to take an interest in this technology.

We started marketing our leading product, “Wi-Care”, in 2012 after seven years of development. It made us the leaders in objects and connected machines and has resulted in our completing over 200 assignments in industries around the world.

Our strong growth now enables us to employ 150 people across Europe and thus to keep jobs on our continent.

What products/services have you developed based on this technology?

Remote Condition Monitoring (RCM) was launched in 2009. The aim of this service is to fill corporate customers’ needs by providing them with the same quality of diagnostics worldwide whilst eliminating the cost of travel for experts.

I-Care added another activity to its business in 2012: Wi-Care, the first wireless spectral vibration sensor. The arrival of Wi-Care solved the cost issue associated with continuous condition monitoring systems.

What prospects are there for this technology in your sector?

We hope that within five years the technology will account for 80% of our turnover.

We’re focusing on three development priorities:

- ▶ **Geographical**, with more than thirteen offices around the world. Australia and Brazil are next on the list.
- ▶ **Product range**: The goal is to expand the product range with other sensors and software.
- ▶ **Acquisitions**: I-Care wants to boost its growth through acquisitions.



I-Care is involved in the Lora-Sens project, which was approved by the MecaTech Cluster at the end of 2016. Its goal is to develop new autonomous wireless, intelligent, and modular industrial tools for predictive maintenance, environmental tracking, and industrial equipment monitoring.

THEY SAID...



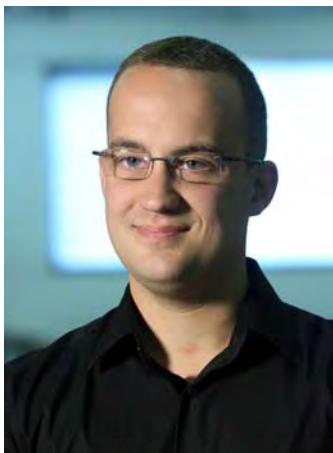
FRÉDÉRIC VASSORT,
CEO, Ampacimon
(Optigrid project)

"I think that the MecaTech Cluster has played the part of an energy booster, of a catalyst that has brought together a group of partners that might never have met otherwise. It continues to support us and to keep us on the right track and has given us the resources we needed to grow more quickly than we could have done if we had had to do the project on our own."



MICHEL MASSON,
Head of the Continuous
Improvement Department,
SEGAL, TATA STEEL
(Virtuoso project)

"The MecaTech cluster played a vital role in the development of our project. It enabled us both to challenge ourselves with the project and also to bring the right people to the table to develop the project."



BENJAMIN HENNEBERT,
Project Manager, DSI
(Tribofutur project)

"The MecaTech Cluster understood the value of the project and backed it. The cluster uses very detailed forms that enabled us to structure the project properly, to draw up the budgets, and to define the staff required and the project steps. It has subsequently attended all of the coordination meetings and we get the benefit of its opinions and advice on managing our project."





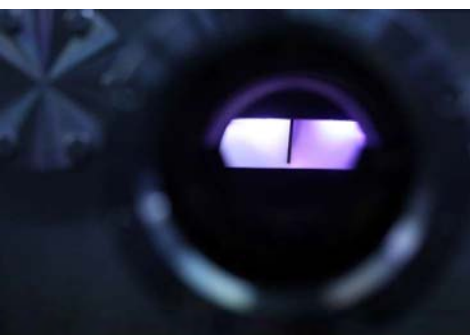
LUC PRIEELS, CEO AIRRIA (Green + project)

"The MecaTech Cluster responded dynamically and pro-actively to our preliminary project proposal. They enabled us to identify additional partners who could join the project consortium. We were able to engineer a better-quality package thanks to their experience and networks."



DAMIEN BERTRAND, Research Project Manager, IBA (WinGTR project)

"It's a real advantage to be able to work with the Meca-Tech Cluster in the different stages of a project: intensively when the project is being started, but also during project follow-up. Moreover, the MecaTech Cluster is helping its industrial partners more and more when a system is ready for market release by enabling them to take part in economic missions abroad and in both local and international B2B ventures that promote the developments made in the Walloon Region and enable this type of technology to be sold efficiently."



MARC VAN DEN NESTE, CTO, AGC Building & Industrial (Mirage project)

"The innovation generated by the competitiveness clusters and the MecaTech Cluster in particular has clearly enabled us to convince our Japanese shareholders to continue to invest in R&D in Wallonia."

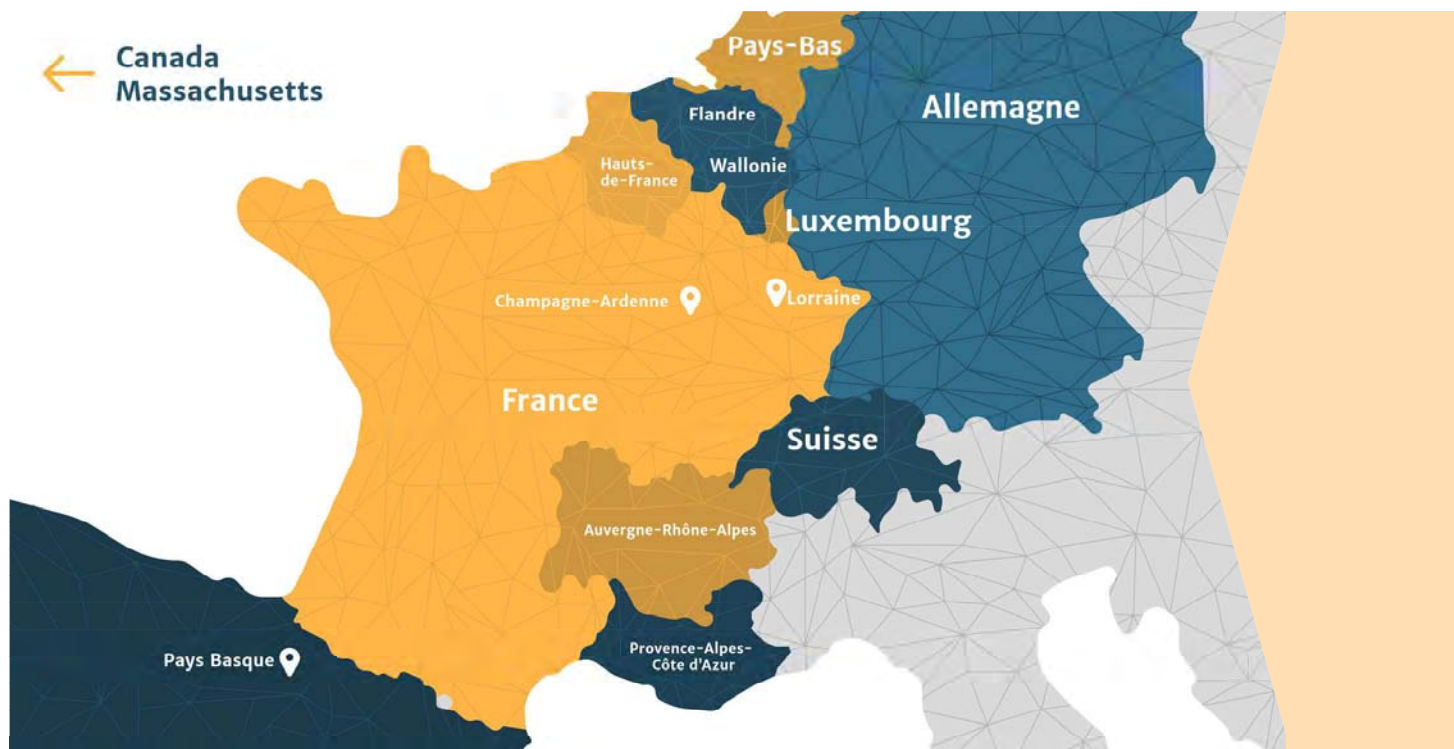


JACQUES PÉLERIN, CEO of the Reverse Metallurgy platform

"Competitiveness clusters make it possible to federate all our scientific, technical, and business forces around one or more joint projects. That is the very philosophy of the MecaTech Competitiveness Cluster. It is no longer possible to work in isolation; we innovate and develop in conjunction with other partners. That is truly the fundamental role of competitiveness clusters, i.e., bringing everyone together to carry out projects that create value and thus jobs in the region."



THE MECATECH CLUSTER INTERNATIONALLY



International action in line with its global strategy: resources focused on the development of industrial projects with international ambitions

The MecaTech Cluster fosters targeted missions and actions with a view to developing international partnerships and/or projects. It builds relationships with foreign clusters and networks for this purpose and surrounds itself with partners that complement Wallonia's mechanical engineering industrial fabric. In addition, certain more limited actions are focused on promoting the cluster itself, which is a way to increase regional development, but not an end in itself.

The three goals of international development

The MecaTech Cluster's international strategy is based on the three following goals:

- ▶ The international dimension of technology projects (international partners in different added value stages: R&D, production, distribution & after-sales service, as well as training);
- ▶ International recognition of the cluster (number and quality of international partners, international partner involvement, international expert participation, access to international financing and networks, etc.);
- ▶ Bringing foreign investors to Wallonia and consolidating the subsidiaries of foreign groups already present in the region (in collaboration with AWEX-Invest in Wallonia).

Geographical selection

The MecaTech Cluster set its sights on the countries close Wallonia as its primary target, namely, the Netherlands, Germany, Luxembourg, and France. This area, which is known as the European “blue banana”, contains most of Europe’s mechanical engineering expertise and is the most favourable ground for initiating collaborative projects.

In addition to these nearby activities, some long-distance operations are also in progress (in Quebec, Massachusetts, Romania, and elsewhere).

Our international activities

The MecaTech Cluster has gradually acquired an international critical mass that has put it on international radar screens. This enables it to take part selectively in European programmes and networks, especially as regards its priority “digital and automation” strategy. These projects will enable it to multiply its activities both regionally and internationally.

WHAT OUR INTERNATIONAL PARTNERS THINK

HIGH TECH NL

High Tech NL recently published a book called High-tech Industry and the Geographic Perspective. High Tech NL is a representative of the Dutch high-tech industry. The book describes their vision of the power of innovation over the long-term.

“It goes without saying that innovation is the driver of a stable economy and provides both employment and added value. European countries are too small to go it alone. That’s why High Tech NL encourages high-tech companies to build synergies with their neighbours. We encourage both large companies and SMEs to cooperate in innovation and the MecaTech cluster is our partner and guide in Wallonia. Wallonia offers unexpected specialisations in the technology and materials field. The MecaTech Cluster helps us smooth out any potential obstacles to ensure that entrepreneurs, experts and researchers meet. The future of the high-tech industry in Europe will be determined by the cooperation between companies and regions. That’s why High Tech NL values its cooperation with MecaTech CC, our partner in Wallonia.”



JOS VAN ERP

Programme Director, High Tech NL

LUXINNOVATION

The Luxembourg agency Luxinnovation acts as a facilitator for access to national and European financing, for launching innovative businesses, for finding technology expertise, and for professionalising innovation management. The agency is the National Contact Point for Horizon 2020, for the European Space Agency (ESA), and for the EUREKA inter-governmental initiative.

"Given their respective missions, the MecaTech Cluster and Luxinnovation have had a solid and productive partnership for several years. Exchanges take place in a spirit of trust and mutual respect based on common goals and enable us to provide support to our customers beyond national borders. Our respective players thus have access to a real technology transfer platform and openings onto their markets. Our collaboration crystallised in the course of a number of trans-regional activities such as the InterMatGR project, which led to the creation of a cross-border network for materials and processes, the 2014 Business-Meets-Research Forum, and the Métamorphoses show in 2015."



JOHNNY BREBELS

Head of Sector "Materials & Production Technologies", Luxinnovation

MATERIALIA

MATERIALIA is a leading cluster of collaborative innovation in materials and processes in France. **MATERIALIA** concentrates within its territory the industrial and academic critical mass required to meet the challenges of tomorrow's materials, i.e., improved performance, lighter weight, greater functionality, and sustainable development.

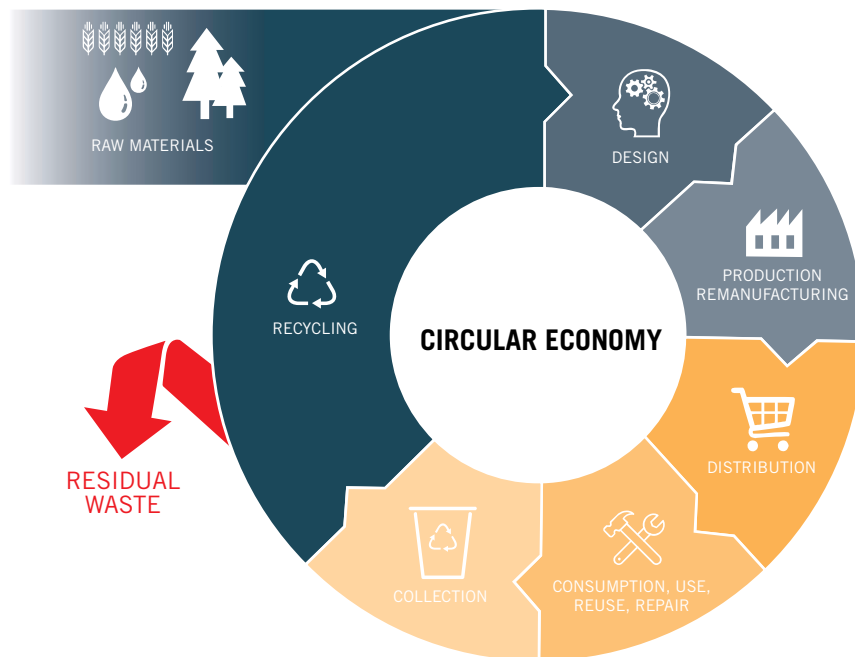
"The three clusters of the Grande Région (Materialia, MecaTech, and Luxinnovation) created the cross-border INTERMAT meta-cluster for MATERIALS and PROCESSES. The INTERMAT Cluster has led to the development of close cooperation between Materialia and MecaTech via joint INTERREG projects such as INTERMAT GR and VITAMIN, which are aimed at improving the competitiveness of companies, laboratories and regions. It has also resulted in the organisation of several events including seminars, the Métamorphoses show, visits to R&D centres, exchanges of speakers, and so on. Today, bolstered by these experiences, Materialia continues to strengthen its collaborative partnership approach with MecaTech to create structuring projects for the region's companies."



THIERRY JEAN

President of the Materialia Cluster

THE CIRCULAR ECONOMY



The goal of the Circular Economy is to separate economic growth from the use of resources. More precisely, it provides ways to create (economic, environmental, and social) value while reducing the consumption of production inputs (materials, energy, water, etc.) and environmental impact (notably CO₂).

Concrete examples include using additive technologies to generate less waste, incorporating recycled materials in production, using biodegradable or recyclable materials, designing products so that they are easy to disassemble, extending product life, virtualising and digitising, using trapped heat and reintroducing it into own processes or those of another company, using locally produced materials, etc.

The Circular Economy also includes performance and functional economy models (purchase of use, i.e., the service that provides a product instead of the product itself). In an economic environment that is increasingly impacted by dwindling resources (energy, raw materials, water, etc.) and high price volatility, circular business models will become more competitive than linear models (extract-manufacture-use-discard) in coming years. That is why, in addition to Competitiveness Clusters, the Walloon Government has implemented a cross-functional industrial policy programme called “NEXT Toward a Circular Economy”.

The initiative is led by Minister Jean-Claude Marcourt. NEXT’s goal is to use Circular Economy principles to improve the competitiveness of companies by creating high added value industrial projects and identifying profitable channels.

The MecaTech Cluster is actively involved in this approach and intends to promote the contributions of the Circular Economy in current and new projects. The cluster has from the very start supported a number of projects that meet the following challenges:

- ▶ Production methods using fewer raw materials: MAG&AL, THIXOWALL, LIONEL, LEGOMEDIC, etc.
- ▶ Transformation of waste into resources: PHOENIX, CARMAT, SOLARCYCLE, PHOEBUS, etc.
- ▶ Energy Management/production/storage: MIRAGE, POWER, PREMASOL, SOLAUTARK, COMOTEX, PV CZTS, LED, OLED, OPTIGRID, COOLROOF, SOLINOX, etc.

These projects bring together 158 players, including 76 companies, for a total investment of €93,884,004 and €65,896,709 in Walloon Government subsidies. It is therefore logical that MECATECH and NEXT are collaborating to meet these challenges and to seize new opportunities in the cluster’s strategic fields.

Last but not least, the MecaTech Cluster and NEXT have both contributed to the creation of the REVERSE METALLURGY platform. This platform will lead to cutting-edge technologies and products, maximising Walloon effectiveness and know-how in each step of the metals recycling process, in line with the Circular Economy and sustainable development principles.

THE DIGITAL REVOLUTION



Industry 4.0 is a key technology step and Wallonia must seize it as an opportunity to redeploy its industry. The MecaTech Cluster has been committed to this approach for a number of years via the financing of several R&D projects under the competitiveness cluster policy.

The importance of Digital in the MecaTech Cluster's strategy is continuing to grow and has taken shape around three levels of action, to wit:

- ▶ A policy to promote the use of digital in products developed and sold by members of the cluster (all businesses included: maintenance, automotive, medical devices, connected objects, etc.) (demand side)
- ▶ Digitisation of industrial processes in order to improve quality, productivity and competitiveness (demand side)
- ▶ Development of new skills in companies specialised in the digitisation and automation of companies (supply side), particularly SMEs. The skills to be provided include: simulation, automation, high computing, big data, additive manufacturing, sensors and actuators, intelligent maintenance, microelectronics, power electronics, microfluidics and the digitisation of integrated chains.

The “digitisation of the industrial fabric” must be based on stronger cooperation between “traditional” and specialised companies for better matching of the demand for digitisation with the competence available in Wallonia.

The MecaTech Cluster is launching a new regional programme to do just that: **Factory 4.0**.

The goal is to accelerate the digital transformation of SMEs by providing them with a clear and concrete understanding of the priority changes to make in their strategies. Based on this action plan, the MecaTech Cluster will identify partners who can provide the skills required and the best financing options to implement the action plans.

The programme is financed entirely by the European Regional Development Fund (Interreg France Wallonie Vlaanderen Go-toS3) and Wallonia to the tune of about ten days per company.

The MecaTech Cluster is also taking part in awareness-raising and promotional actions initiated by the “Made Different Digital Wallonia” programme coordinated by Wallonia's agency for digital affairs Agence Wallonne du Numérique. Discover the challenges and testimonials of companies using these technologies.







PROJECTS APPROVED BY THE MECATECH CLUSTER

2007-2016

ENERGY & THE ENVIRONMENT



CARMAT

CARMAT is a project aimed at increasing the recyclability of steel mill slag by recovering the fine fractions for which there are no or few outlets and incorporating them in materials for the building and public works (BPW) sector.



This project also has two other aims, namely:

- ▶ to help cut CO₂ emissions through less energy-intensive materials manufacturing processes than those of rival products (bricks, cement blocks, etc.) and based on carbonation using industrial CO₂; and
- ▶ to guarantee the products' toxicological and environmental harmlessness by immobilizing possible contaminants in materials made from stainless steel slag lastingly.

CONSORTIUM:

Recoval-Orbix Solutions | Duferco | CTP | CRR | CSTC | ISSeP | UCL/Mema | UCL/Toxi

R&D,
INVESTMENT,
AND
TRAINING



COMOTEX

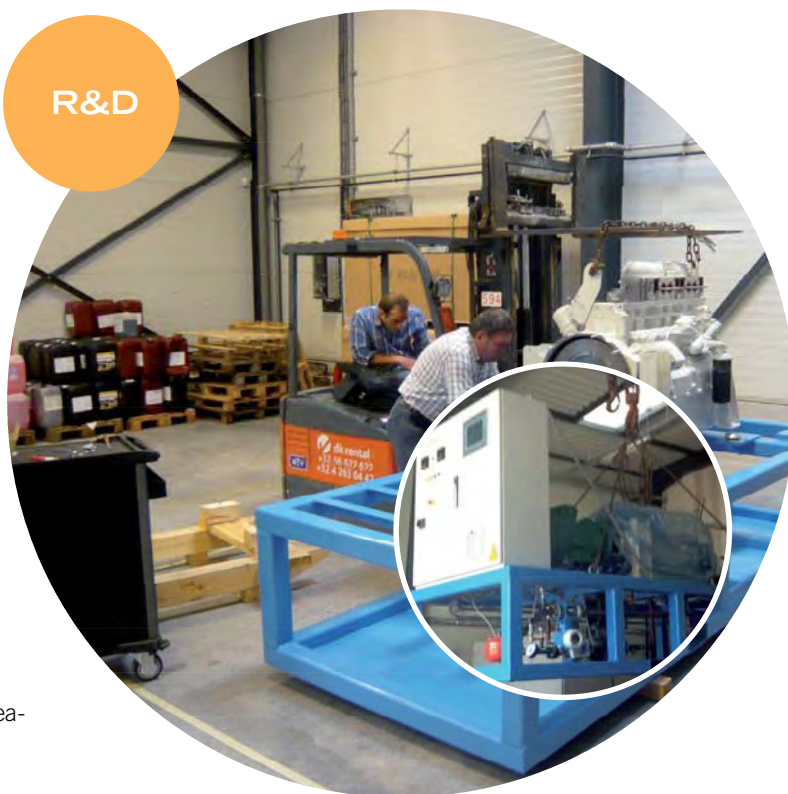
COMOTEX concerns research on and the industrial development of a biomass-powered external combustion engine for the cogeneration of electricity and heat from a green energy source.



The aim is to prove the technical feasibility of an installation that combines a thermal engine and a furnace to generate electricity and heat. The challenge is to get the highest possible power output.

There are many applications for this product, which could be installed in most companies where power consumption for heating exceeds 200 kWh.

R&D



CONSORTIUM:

Coretec | Evolve Powertrains | POMMEE | ULG | CRIG

COMP2BLADES

Fairwind's approach in the context of the COMP2BLADES project is in line with the general context in terms of the need for renewable energy and the trends observed in the wind small turbines market.



The European Directive (2009/28 / EC) imposes 13% renewable energy in the Belgian energy mix in 2020. And by 2030, a new European aim will target at least 27% of renewable energy in the EU energy. These targets bring the share of the On-Shore wind sector projected by the Walloon Government to 680 GWh and 4403 GWh respectively for the years 2020 and 2030. Fairwind began the commercialization of its products in 2012 (14 machines installed with feedback experience of 3 years) and is currently working to strengthen its sales force in Belgium and abroad.

CONSORTIUM:

Aerofleet | Cenaero | Fairwind | Isomatex | Centexbel



GAC

The GAC project is the implementation of a "Proof of Concept" (PoC) to evaluate the technical and economic interest of a residential aggregator in the Belgian electricity market.



Today, the electrical system is reaching its limits. To mitigate this, an innovative solution is to mobilize the flexibility of demand. In order to establish this new system, a new actor - aggregator - is created. His role? To aggregate / federate a large number of consumers ready to make their flexibility available.

The GAC project focuses on the development of a reliable and open central software platform, capable of processing a very large amount of data (Big Data) very quickly.

CONSORTIUM:

Arewal SCRL | Cetic | GreenWatch | Haulogy.net | ULB/IGEAT



LED

R&D

The LED project involves developing large yet discreet aesthetically pleasing lighting panels to cover large surface areas.



This project concerns lighting and mood applications that integrate smart functional features to offer customers products that are easy to install and a snap to use. At the same time, its designs will meet customers' expectations optimally so as to carve out a place for its products on the extended light source market.



CONSORTIUM:

CRM | CE+T Technics | Gentec | Sirris | ULg | Arceo | Serel

NANOSOL

R&D

The aim of the NANOSOL project is to develop sol-gel dispersion and functionalization technology by means of industrially applicable nanomaterials.



Lighting systems that provide 50% more light for the same energy consumption, glass tables that will not scratch, new buildings that include metal claddings that are not only more resistant to mechanical attack but also offer peerless aesthetics and design...

These are just some of the opportunities that marrying nanomaterials and surface coating technologies offers. Enriching surfaces and objects of daily use with innovative functional features is what the Nanosol project wants to do for the Walloon Region.



CONSORTIUM:

AGC Glass Europe | Arceo Engineering | Arceo | Materia Nova | UMONS | UNamur | Ionics | CRM

OLED

The aim of the Ecolighting OLED project is to develop innovative components usable for making new-generation OLEDs (Organic Light Emitting Diodes).



These planar light sources, which are found in rigid, curved, and flexible forms, offer an infinite range of design and architectural possibilities.

The project will culminate in no less than the creation of a new industry with a great diversity of applications that will feed a new segment of the lighting industry.



CONSORTIUM:

AC&CS | AGC Glass Europe | Solvay | CE+T Technics | Taipro | Lasea | Materia Nova | ULg | UNamur | UCL

OPTIGRID

The aim of the OPTIGRID project is to miniaturize an intelligent sensor for high- and intermediate-voltage lines that has maintenance prediction and fault detection abilities.



The OptiGrid project belongs to the current SmartGrid movement. This generic term refers to making high- and intermediate-voltage power grids “intelligent” by including a series of sensors in order to optimize their management.

The aims?

To increase overhead power lines’ capacities quickly and affordably; integrate renewables better; improve real-time knowledge of the grid’s physical condition; check vertical safety distances between cables and obstacles; and provide means for predictive maintenance and fault detection in overhead power lines.



CONSORTIUM:

Ampacimon SA | Optim Test Center | Tecteo Resa | ULg | UCL

PCC80

The project PCC80 proposes to integrate buildings with an innovative heating system, allowing a more rational use of renewable energies.



PCC80 develops an optimized system of granulated, multifuel wood boiler of very high performances: exceptional quality of view of the flames and of burning performances.

Some new features:

- ▶ new generation design and competitive of granulated multifuel boilers
- ▶ integrability of ENR
- ▶ design of a coated glass production line
- ▶ prototype production of low-cost optical glazing
- ▶ thermal comfort supervision service
- ▶ supervision and optimization tool of thermal comfort and energy performance
- ▶ platform for the analysis of glass and tests on real ovens
- ▶ sharp implement tools

CONSORTIUM:

Cenaero | I.S.A. | Ionics | STUV SA | ThingsPlay | UNamur | Materia Nova

R&D AND TRAINING



PHOEBUS

Armed with the deliverables of the Phoenix project, the PHOEBUS project is proposing an integrated process for the high-added-value use of reclaimed materials as fuel.



This integrated process comprises a fuel purification step (patented innovation) so that the fuel is suitable for injection into a specially modified cogeneration motor for optimal energy yields (net electricity yield above 45%) and environmental performance (low airborne emissions).

Given today's context of searching for new energy solutions for the future, turning organic waste (plastics, rubber, foams, and so on) into manmade fuel is a booming field of activity that is starting to give rise to operational industrial production units.

R&D



CONSORTIUM:

Comet Traitements | Coretec Engineering SA | Certech | ULB

PHOENIX

The aim of the PHOENIX project is to develop a low-temperature, low-emissions, integrated process for the comprehensive recovery and recycling of the organic matter contained in scrap metal grinding residues.



The processing and recovery of scrap metal (end-of-life vehicles (ELVs), collected scrap metal, etc.) generate huge amounts of grinding residues. These residues are goldmines of matter, the recovery and re-use of which have become extremely important economically and environmentally.

The result?

This project has led to the development of a low-temperature, low-emissions, integrated process for the comprehensive recovery and recycling of the organic matter contained in the grinding residues of metallic waste.

CONSORTIUM:

Comet Traitements | Slegten Magotteaux | ULg | Certech | CRM | FLC Technology



R&D

POWER

POWER is a project aimed at improving wind turbine reliability and optimizing the amount and quality of power generated.

The project has three main objectives, as follows:

- ▶ Optimizing maintenance costs via an advanced monitoring system that can generate indicators from multiple sources and allow real-time diagnosis of the state of the machine as well as forecasting its components' lifespans;
- ▶ Developing innovative sensors using optic fibers in order to refine various measurements and optimize both diagnosis and forecasting;
- ▶ Optimizing and predicting production by improving the electricity chain, studying the power generation and weather forecasting records, and creating fault-tolerant settings.

CONSORTIUM:

Maintenance Partners Wallonie | PEPiTe | ATM PRO | UMon | ULB | Technofutur Industrie | Technifutur



R&D AND
TRAINING

PREMASOL

R&D

The PREMAsOL project aims to go beyond the “Smart Metering” concept to that of the “smarter grid” by adding a forecasting factor and an actuator to renewable energy sources (RES).



The specific aims of this project are to provide solutions for the:

- ▶ problems linked to the maintenance/management of these installations;
- ▶ problems of balance between RES production and consumption; and
- ▶ problems linked to connecting these RES production units to the distribution grids.

CONSORTIUM:

GreenWatch | Mentis | ULB | ULg



PV CZTS

R&D

The PV CZTS project is aimed at integrating $\text{Cu}_2\text{ZnSnS}_4$ (CZTS) second-generation photovoltaic cells in glass and steel.



Copper zinc tin sulfide is a material with great photovoltaic energy potential and abundant natural resources, enabling it to keep step with rising world energy demands. The CZTS active layer also has the advantage of using only non-toxic materials, meaning that it dovetails fully with sustainability goals.



CONSORTIUM:

AGC Glass Europe | AC&CS | UCL | Umons | UNamur | Lasea

PVMAINT

PVMAINT is a training project aimed at giving workers skills in the area of installing and maintaining photovoltaic panels.



PVMAINT therefore aims to complete the existing training offer with a five-strand project, to wit:

- ▶ good practices in siting and setting up a PV installation;
- ▶ the specific elements of a PV installation (PV technologies, standards, inverter technologies, cables, batteries, electrical protection, etc.);
- ▶ maintenance and fault diagnostics;
- ▶ the safety of people and property; and
- ▶ the risks inherent in PV installations for firefighters.

CONSORTIUM:

Technifutur | Eliosys | Sunswitch | Decube | Cluster TWEED

TRAINING



SOLAR PERFORM

The resistance of the absorber tubes faced with thermo mechanical coercion constitutes an essential stake for the sustainability of a solar power station. This is the subject of the SOLAR PERFORM project.



A solar power station, operating at temperatures above 700°C, is composed of a solar receptor. It is made up of thermal absorbers that must withstand extreme conditions: high thermal gradient, day/night cycling... and this for 25 years guaranteeing an optimal efficiency.

To limit expensive maintenance operations, SOLAR PERFORM seeks to optimize the resistance of the absorber tubes.

The project is also considering how to meet the very specific optical specifications by developing a new, more efficient absorbent coating.

CONSORTIUM:

CMI | CRM | Lithcote Europe | ULg

R&D



SOLARCYCLE

The SOLARCYCLE project is aimed at creating a recovery and recycling unit for end-of-life first-generation photovoltaic panels in Wallonia.



Close to 8,000 metric tons of waste from end-of-life photovoltaic panels have been collected in Europe in the past three decades. This include 220 tons in Belgium. It is thus important to prepare for the arrival of such waste streams so that our rarest nonrenewable resources are conserved and our solar panels never become useless waste.

Among other things, a photovoltaic panel recovery chain was set up in the first year of this project and various avenues for dismantling, de-encapsulating, separating, and purifying the panels' component materials were explored.

SOLARCYCLE aims not only to achieve a maximum (more than 95%) recycling rate of these end-of-life panels, but also to re-use the recovered materials in high-added-value applications.

CONSORTIUM:

RECMA | Comet Traitements | ULg | ULB

R&D AND
TRAINING



SOLAUTARK

The SOLAUTARK project is studying the science of and developing the technology for an autonomous solar heating system for the home using chemical interseasonal storage.



The aim is to be able to dispense totally with the consumption of nonrenewables for home heating in dwellings that have low heat losses but are not built to "passive house" standards.

R&D AND
TRAINING



CONSORTIUM:

Arcelor-Mittal | ESE Solar | Atelier Jaspard | M5 | ULg | ULB | UMon | CTIB

SOLINOX

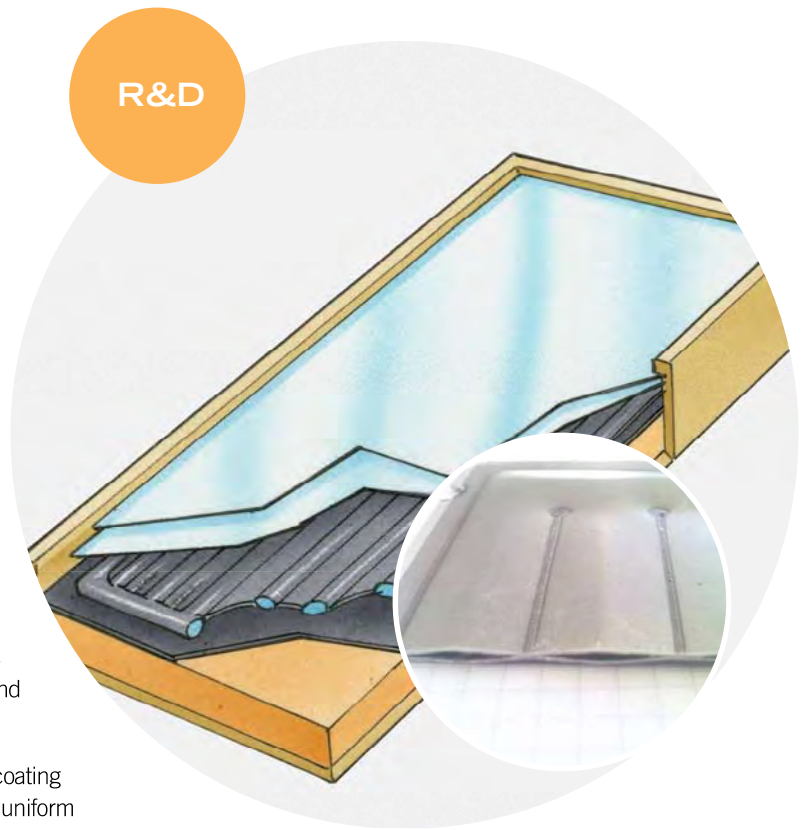
R&D

SOLINOX is a project to develop an innovative thermal solar collector that differs from conventional collectors by its design and manufacturing method.



When it comes to the principle, the absorber will be modeled after a household radiator (heat-transfer fluid circulating between two prewelded sheets of steel). The new SOLINOX absorber will differ from its competitors by the following:

- ▶ it will be made entirely of thin layers of stainless steel, which is advantageous in terms of cost, weight, corrosion resistance, and image;
- ▶ it will be prewelded before the application of a selective solar coating by a vacuum PVD process, which will give it a highly esthetic, uniform appearance;
- ▶ it will be shaped like a radiator by pneumoforming, for simplicity and high heat-exchange performance between the metal sheet and fluid; and
- ▶ it will be incorporable into standard collector housings so that it is interchangeable with today's products.



CONSORTIUM:

ARCEO | BESOL | MALEX | CEWAC | Umons

ULTRA-CB

R&D AND
TRAINING

ULTRA-CB is an industrial research project on sol-gel nanocoatings capable of protecting applications subject to high mechanical and/or thermal stresses from corrosion.



The cast-iron furnace proved to offer an excellent opportunity to apply the results of this research to a new very-high-performance cast-iron furnace body insensitive to the corrosion phenomena generated by internal condensation, regardless of the source of the smoke generated by the combustion of gas or heating oil.

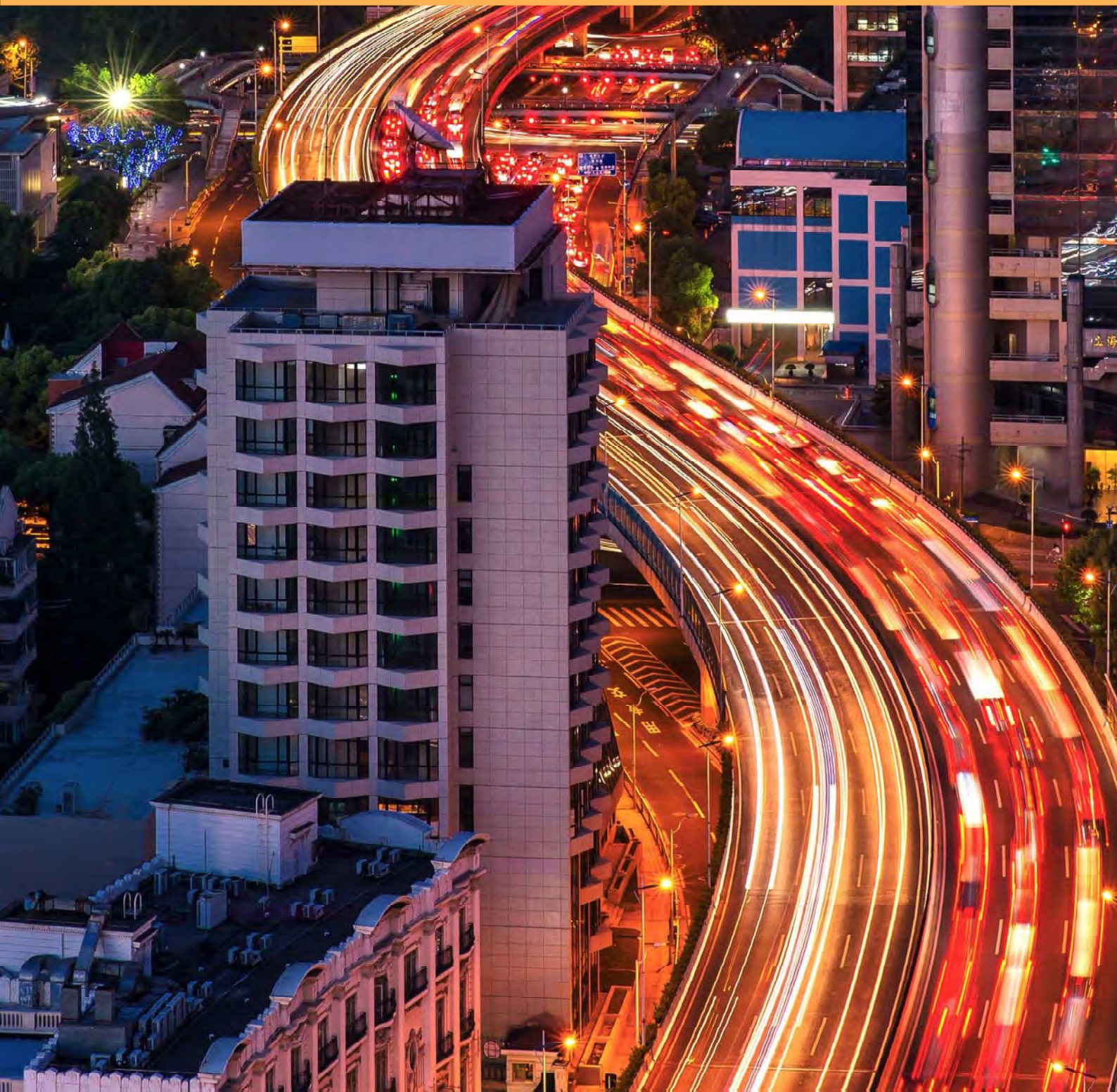


CONSORTIUM:

Saint-Roch Couvin | IONICS | CRIG | Umons | ULg



MOBILITY & TRANSPORT



ARX

R&D

The aim of the ARX project is to develop a versatile self-powered chassis for agriculture and civil engineering.



Currently, most self-powered agricultural machines for planting and harvesting are used for periods ranging from only two weeks to three months a year. The main reason for this underutilization is that these machines are composed as a rule of an engine, a control unit, and a chassis dedicated to one and the same application, such as harvesting beets.

An overview of the service company and large agricultural farms market shows that the quick interchangeability of specialized attachments will make it possible to use the same chassis for several applications.

The results are huge investment savings and productivity gains (high yields, better returns on investment, and more opportunities for the driver).

CONSORTIUM:

Bemad | Gilles Clermont | Carah | Creheh



ATAC CONCEPT

R&D

The aim of the ATAC-CONCEPT project is to develop new auxiliary power converter system designs.



These converters must be more integratable into their environments: better energy efficiency, drastic reductions in size and weight, better incorporation in the railroad car's body, and less noise pollution.

The conversion of the electrical energy available on an overhead contact line to electricity that can be used on board a train is necessary not only to drive the train, but also to power its various auxiliary systems so as to provide functions such as heating, air-conditioning, and lighting.



CONSORTIUM:

Alstom | Thales Alenia Space | Weisshorn | Cissoid | Nanocyl | Cerdecam | Jema | ULG | UCL

ATAC-HP

The ATAC-HP project has led to the construction of inaudible revolutionary static converters that are more compact and offer a better performance.



The electric power available on trains comes from the catenary. This energy needs to be converted with static converters for consumers.

Conventional converters have always ensured this function, but they were too heavy, too bulky and too noisy with poor performance. The ATAC project has served to build innovative and inaudible static converters. Their mass and volume has been reduced by 3 with an enhanced performance of about 5%. In terms of sustainable development, this improvement saves about €30,000 of electrical energy over the lifetime of a converter.

R&D



CONSORTIUM:

Calyos | UCL | ULg | Cissoid | Jema | Alstom

CASTT

CASTT - Campus Automotive Sustainable Technologies – is a training project on clean engines.



The aim of this project is to gear up for the green technologies that are entering cars and create skills for the sector's enterprises. Examples: electric motors, micro Smart grids comprising power generators, consumers (charging units and electric vehicles), and a smart management system. The campus will have exceptional facilities (test benches) in the area of clean, electric engines – the only such facilities in Wallonia.

TRAINING



CONSORTIUM:

Campus Automobile Spa-Francorchamps | IFPM | Comet Traitement | Educam | Greenspeed N Technology | ULg | Siemens | D'Ieteren

COSMOZ

The COSMOZ project brings together the main entities in Wallonia that are involved in engine research in order to optimize engines powered by compressed natural gas (CNG).



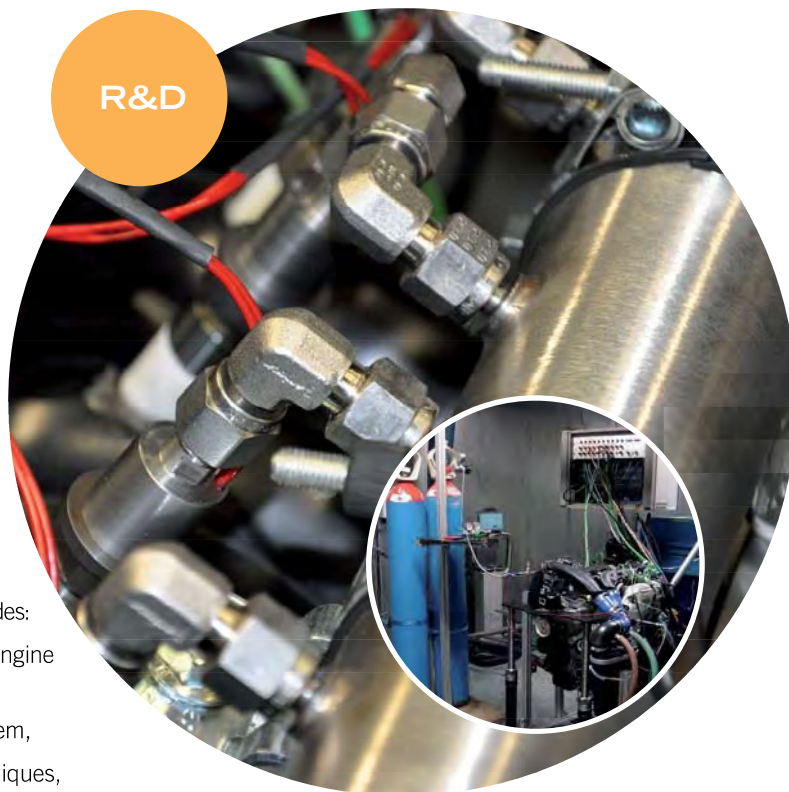
The conversion to natural gas concerns both gasoline and diesel engines.

The development work being conducted within COSMOZ includes:

- ▶ developing high-pressure direct injection systems and engine management electronics,
- ▶ calibrating engines on the test stand and depolluting them,
- ▶ improving the engine's lifespan using radiotracing techniques,
- ▶ running digital simulation CFD software, and
- ▶ measuring vehicle emissions on the chassis dynamometer.

CONSORTIUM:

GDTech Engineering | BTD Breuer Technical Development | Skynam | DSI Delta Services Industries | ULg | UCL



DOLRE

The DOLRE project is an alternative to traditional guardrails, which offers sufficient resistance to restrain cars and buses. This is achieved by maintaining the appearance of a pedestrian guardrail.



The placement of these contrivances on the engineering structures will be carried out by means of a beam of distribution of the forces to which they will be anchored via a force limiter. This combination will affect both the causes and the consequences in terms of solicitation of work.

This will enable road managers to save more than several times the cost of the solution.

Changes in other sectors are planned: explosion, nuclear, seismic...



CONSORTIUM:

Desami SPRL | JLM SPRL | GD TECH SA | UCL | ULg

DRIVE TO CNG

The "Drive to CNG" project aims to create trainings in the automotive sector in order to prepare the sector for the massive arrival of compressed natural gas (CNG) vehicles.



Thanks to the DRIVE TO CNG project, the Spa-Francorchamps Campus Automobile with the active support of its partners, will offer 16.000 hours of trainings in three years, in order to prepare the professionals of the sector. Indeed, the properties of the CNG against its competitors "Diesel" and "Essence" have no doubt, either in terms of autonomy or reduction of pollution. In addition, this project will allow the campus to invest in these technologies of the future and to acquire professional equipment, in order to deliver a high class training.

TRAINING



CONSORTIUM:

ANPI | Campus Francorchamps | Educam | ARGB/NGVA.be | ENGIELab – CRIGEN

HAVCOAT

The aims of the HAVCOAT project are to optimize powerful yet ecological amorphous hydrogenated carbon (a-C:H) surface coatings and to develop tools for producing, characterizing, and validating these surface treatments.



Namur University (UNamur) has developed an a-C:H surface coating specially designed for engine bearings; it reduces wear and the friction coefficients of these parts but can nevertheless undergo a shaping phase. The aim of this project is to optimize both the plasma process and the coating's performance for use in high-added-value sectors. The automotive industry (racing) has already shown interest in it based on a preliminary assessment of the coatings' properties. BTd and DSI are now tasked with developing novel test benches for and means of validating the coated bearings, such as radio-tracing techniques for real-time monitoring of wear. That will be done in partnership with ULg, which will mark the surfaces subject to wear. The company JTEKT TORSSEN Europe is taking part in the project with a view to adapting the coating to parts in TORSSEN differentials so as to enhance current performance levels and reduce operating noise. Finally, the company FN Herstal has shown interest in developing a version of the coating that will improve the mechanical output of the moving parts of firearms.

R&D



CONSORTIUM:

DSI | BTd | Unamur | ULg | FN | JTEKT Torsen | FN Herstal

LIGHTCAR

LIGHTCAR is a computer-aided engineering project in which software and geometrical modeling techniques are used to run virtual tests on cars.



This project concerns lighting and mood applications that integrate smart functional features to offer customers products that are easy to install and a snap to use.

At the same time, its designs will meet customers' expectations optimally so as to carve out a place for its products on the extended light source market.



CONSORTIUM:

SAMTECH | Free Field Technologies | GDTech | ULg | UCL | Carat Duchatelet | JTek Torsen | MSC Software | Sabiex International

TRACTION 2020

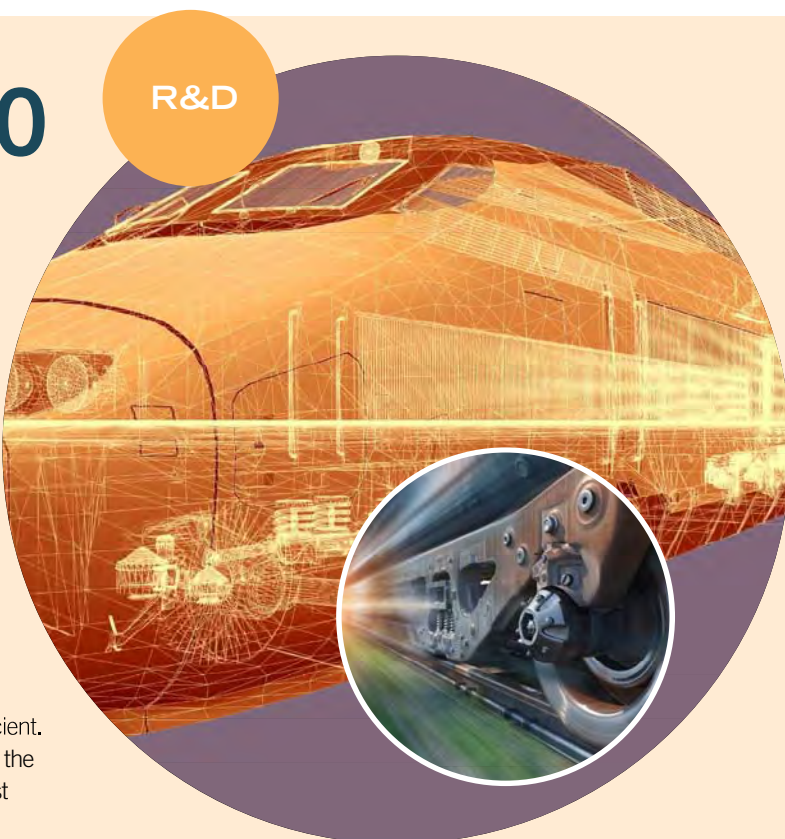
The Traction 2020 project aims to create a technological break in the railway sector by revolutionizing the traditional equipment of the traction chain of trains.



The increase of the speed of trains' operation, their reliability as well as their energy performance, which depends mainly on the traction chain. In twenty years, this chain has undergone a revolution by the introduction of new power converters and new traction motors.

The choices of the time, although revolutionary, are no longer efficient. The objective of this project is to create a technological break with the traditional equipment of the traction chain by introducing the latest developments in motors, converters, reducers and even boots.

The goal is to improve the efficiency of minimum 5% and minimize the LCC in a drastic way by the introduction of magnetic reducers and natural ventilation.



CONSORTIUM:

46 | Citius Engineering | Alstom | ALM | Coexpair | ULG | Académie de Louvain

TRIBOFUTUR

R&D,
INVESTMENT,
AND
TRAINING

TRIBOFUTUR has led to the development of an unprecedented surface coating made from amorphous hydrogenated carbon that combines high wear resistance and reduced friction.



This project consisted in developing technical solutions meeting the future surface treatment and lubrication needs of mechanical systems subjected to major stresses (thermal engines, gearboxes, differentials, precision mechanisms, armaments, and various machines).

The results?

The development of a new super-wear-resistant coating that reduces the rate of wear and coefficient of friction of automotive brake pads and a radiotracing technique for monitoring wear on parts with nanometric precision, which is a world reference for sensitivity.

CONSORTIUM:

Delta Services Industriels DSI | Breuer Technical Development LTD | ULg | UNamur | Renault Sport F1 | Total France | BFP Oil Research

WHOLETRACK

R&D

The WholeTrack project aims to reduce the number of maintenance interventions on the railway network (rolling cars and railway).



WholeTrack provides a better understanding of the mechanisms that govern the behavior of a track, namely the interactions of three elements that support rolling loads and maintain the rails: ballast, ties and sub-treads.

Thanks to the computer developed model and its validation in the laboratory, several "winning combinations" of ties, sub-treads and ballast will be identified. Result: greater durability and less maintenance.

CONSORTIUM:

Prefer | RubberGreen | Sagrex | UCL | CTP

DEFENCE & SECURITY



COMPOMAG

R&D

COMPOMAG is a project to develop magnesium-carbon composite injected parts.



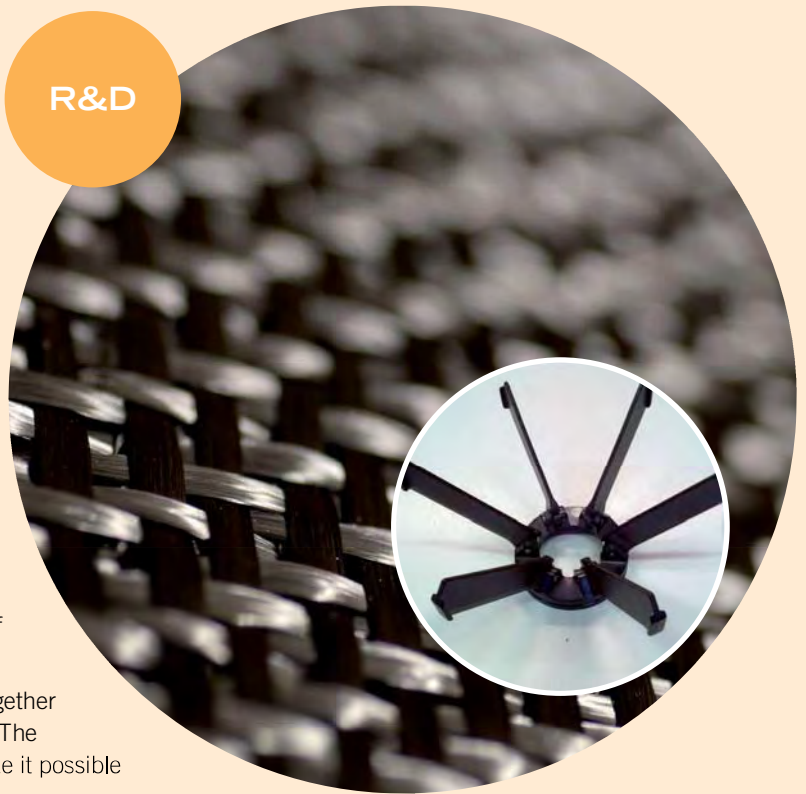
The avenues of research will enable the partners to implement new production methods so that industrial concerns will be able to renew and broaden their product ranges and associated markets.

Another aim of this project is to gather the industrial firms and research units with a potential for innovation around a promising idea that will produce a breakthrough innovation if the project succeeds.

At the end of the project, the partners in the research will together proceed with the products' industrialization and production. The project should generate benefits for all the partners and make it possible to maintain and create jobs.

CONSORTIUM:

Mecar S.A. | Mazzeo-Servioplast S.A. | Sirris | Centexbel | ULg



ElectroHOB

R&D

The objective of the ElectroHOB project is to develop a new electronic rocket concept for illuminating ammunition of the mortar type.



In descending phase, the rocket must make precise measurements of distance to the ground, in order to be able to trigger the operation of an illuminating pot at a defined height.

In order to allow a perfect and rigorous integration in a reduced volume and to submit to extreme constraints, the research focuses on innovative concepts in microelectronics, micromechanics, turbo-machines and dynamic simulation.

The industrialization and the production of the products by the partners is planned at the end of the project.



CONSORTIUM:

Britte Mustad | Centre Spatial de Liège | Institut Von Karman | Mecar S.A. | Micromega Dynamics | Open engineering | ULg-Centre Spatial de Liège

HAVCOAT

The aims of the HAVCOAT project are to optimize powerful yet ecological amorphous hydrogenated carbon (a-C:H) surface coatings and to develop tools for producing, characterizing, and validating these surface treatments.



Namur University (UNamur) has developed an a-C:H surface coating specially designed for engine bearings; it reduces wear and the friction coefficients of these parts but can nevertheless undergo a shaping phase. The aim of this project is to optimize both the plasma process and the coating's performance for use in high-added-value sectors. The automotive industry (racing) has already shown interest in it based on a preliminary assessment of the coatings' properties. BTD and DSI are now tasked with developing novel test benches for and means of validating the coated bearings, such as radio-tracing techniques for real-time monitoring of wear. That will be done in partnership with ULg, which will mark the surfaces subject to wear. The company JTEKT TORSEN Europe is taking part in the project with a view to adapting the coating to parts in TORSEN differentials so as to enhance current performance levels and reduce operating noise. Finally, the company FN Herstal has shown interest in developing a version of the coating that will improve the mechanical output of the moving parts of firearms.



CONSORTIUM:

DSI | BTD | Unamur | ULg | FN | JTEKT Torsen | Hertsal

M4

FN Herstal is coordinating an industrial re-research project called "M4 Multigauge Mecha-tronic Machine gun".



This research project is innovative and unique due to the combination of technologies and disciplines considered in the type of application. A number of deliverables are expected, to wit:

- ▶ a new weapons development methodology that includes new technologies;
- ▶ new modeling and multiphysics simulation tools;
- ▶ the exploration and validation of new concepts; and
- ▶ scale models for experimental validation of all the concepts that are covered.

The products that are developed from this project's outcomes will increase FN Herstal's global market share and employment in Wallonia.



CONSORTIUM:

FN Herstal | MicroMega Dynamics | V2i | Sirris | Open Engineering | ERM | ULg | ULB

MRIPF

The objective of the MRIPF project is to better understand and control the phenomenon of rupture or fragmentation, resulting from cracking.



This phenomenon is interesting for the scientists, since it must either be excluded from certain applications or be controlled in order to orient the fragments (for example ammunition) in a certain direction (problem of collateral damage).

MRIPF aims to:

- ▶ understand the physics of the phenomenon
- ▶ to develop a database of numerical models for propagation analysis of these cracks, in order to determine their behavior in industrial situations
- ▶ design the innovative products on this basis.

A plus for the armaments market and all industrial applications, related to the phenomenon of fracture!

CONSORTIUM:

Capital People SA-Carat Duchatelet | Mecar S.A. | Forges de Zeebrugge | ULg | UCL | GDTech S.A.



R&D

NanoAppli

The MT_NanoAppli project consists of optimizing the production capacities of nano-powders, developed in Nano-Tech and of releasing industrial applications.



The use of nano powders in Belgian defense products, should lead to innovative explosive and propulsion characteristics.

These nano powders will be used in existing production processes. In order to ensure the consistency of their characteristics - and thus their lifetime - a special coating will be developed.

The applications of this project can be extended to other sectors: space propulsion, safety (airbag), medicine...



R&D

CONSORTIUM:

CoRi Coatings | Institut Von Karman | Levasseur Newco | Mecar S.A. | ULg | UNamur | FN Herstal | Nanopole | Materia Nova

SWS

The aim of the SWS project is to integrate a totally electronic explosive train into a weapon.



This integration requires study of the following technological blocks:

- Secure communication: Today, in the era of the Internet of Things, it is important to be able to communicate with weapons as transparently as possible
- Electronic activation: The ammunition can be detonated either electromechanically (electronically-controlled striking pin with traditional ammunition, for example) or electrically (in which case an electrical signal activates the primer cap)
- Electrical priming: If the heart of the weapon becomes totally electronic, the ammunition must be changed along the same lines to ensure its maximal integration in this development. We are thus working on developing new primer cap compositions and structures.
- Energy recovery: A weapon necessarily releases a huge amount of energy. However, it is not easy to have the right energy at the right time (before the first shot), nor is it easy to convert the energy effectively, given that the energy is released in pulses. Both of these aspects are studied in this project.

A new optimised weapon architecture will thus be developed on the basis of these different technological blocks.

R&D



CONSORTIUM:

nSilition | ULB | FN Herstal | ULg

HOUSING & CONSTRUCTION



BIOAFP

BIO-AFP is a project aimed at developing anti-finger print properties on glass and metal through biomolecules.



To deal with the problem of unsightly finger prints effectively, the industrial concerns AGC Glass Europe, Arceo, Nanoxid, De Leuze, Symbiose Biomaterials, and Realco and a series of scientific partners (Liège University's Metallurgy Research Center and Mons University) decided to join forces to develop an innovative solution borrowed from nature.

The new anti-finger print (AFP) coating for glass and metal that has come out of this project will make it possible to meet all the requirements that are linked to these materials, including that of durability, through the application of a totally original process that guarantees the presence of biomolecules on the glass or metal's surface throughout the material's lifetime.

R&D



CONSORTIUM:

AGC Glass Europe | Arceo | IONICS | De Leuze | Symbiose Biomaterials | Realco | CRM | ULg | UMONS

CITIUS HOUSE

As part of the development of its activities, Citius Engineering will invest in the construction of a new building in the Sart-Tilman Scientific Park.



This project oversees the construction of a new building whose offices are sized to accommodate 40 people and thus, to reinforce the engineering skills of Sart-Tilman.

The workshop will include a large assembly area and a laboratory zone to meet the two strategic axes of development of the activity: the development of production facilities, the automation of industrial lines and the development of prototype machines for the pharmaceutical industry.

INVESTMENT



CONSORTIUM:

Citius Engineering

COOLROOF

R&D

The aim of the COOLROOF project is to produce zinc sheet metal with improved energy performance without affecting its look.



This new energy-regulating behavior will be achieved by the deposition of thin optical layers that will limit a building's solar heat gain coefficient, that is, the proportion of incident energy that enters the building. To ensure their durability, these thin layers will be encapsulated in a semitransparent organic matrix.

The project's innovativeness lies in the fact that the proposed system (zinc coated with optically active thin films) has never been produced before.



CONSORTIUM:

Arceo | Umicore | Eliosys | CoRI | CRM | UMONS

DAO

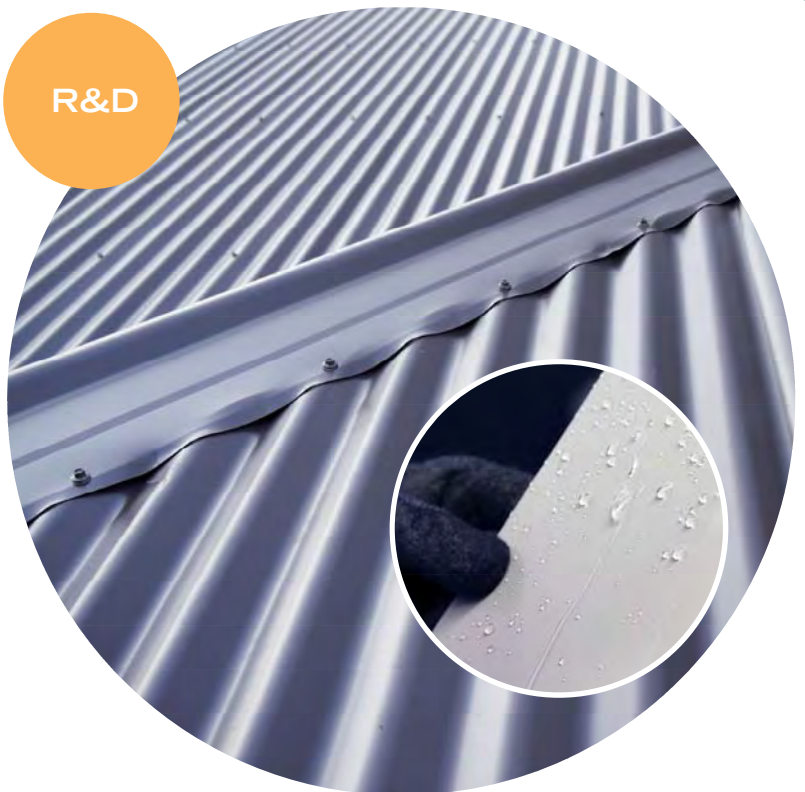
R&D

DAO ("Durable Aesthetic Outdoor") is a project aimed at developing a new surface treatment for pre-lacquered steel intended for use in a building's outer shell that will preserve the building's initial appearance over time.



The results?

The surface treatments that have been developed are thin, transparent coatings that affect the way water runs down buildings' surfaces so as to make them easier to clean under natural conditions and reduce the buildup of dirt.



CONSORTIUM:

AC&CS | Arceo | Realco | ULB | UNamur | Materia Nova | Sirris | ULg

GREEN+

The aim of the GREEN+ project is to develop a system for recovering energy from fouled air with a 90% heat recovery rate that is adaptable for use in existing buildings as well as new constructions.



To do this, Greencom Development has developed two one-of-a-kind compact energy recovery systems,

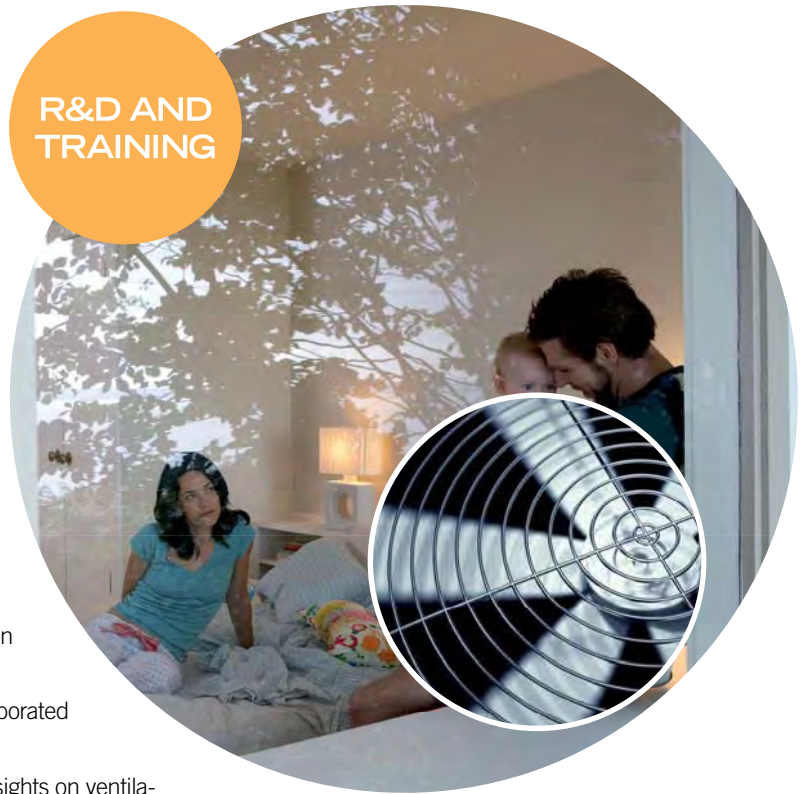
- ▶ one for windows: an alternative ventilation grating that can fit all existing frames in lieu of a conventional grating;
- ▶ the other for walls: a “house respirator” that can be incorporated into existing walls by core-drilling.

And whilst Greencom Development is currently setting its sights on ventilation systems, many other outlets for its products remain possible.

CONSORTIUM:

GreenCom Dev. | WOW technology | Acte | ULG | Sirris | Taipro | CECOTEPE

R&D AND TRAINING



HOSOMI

HOSOMI is a modular industrialized construction system that includes innovative component to serve sustainable development.



It is a modular building concept that revolves around a frame that makes it possible to build rooms of various shapes and sizes (total flexibility) and meet each client's architectural, esthetic, functional, energy-use, acoustic, and other requirements. The modules are built in a factory (time savings, increased efficiency, and better quality control).

The finished modules are then transported to the building site and assembled in a matter of days... All this for a competitive total price.

R&D



CONSORTIUM:

Dethier Architecture | Bureau d'Etudes Greisch | BANP | Arceo | Bemelmans-Balancier D. et Fils | GreenCom Development | UCL | ULg

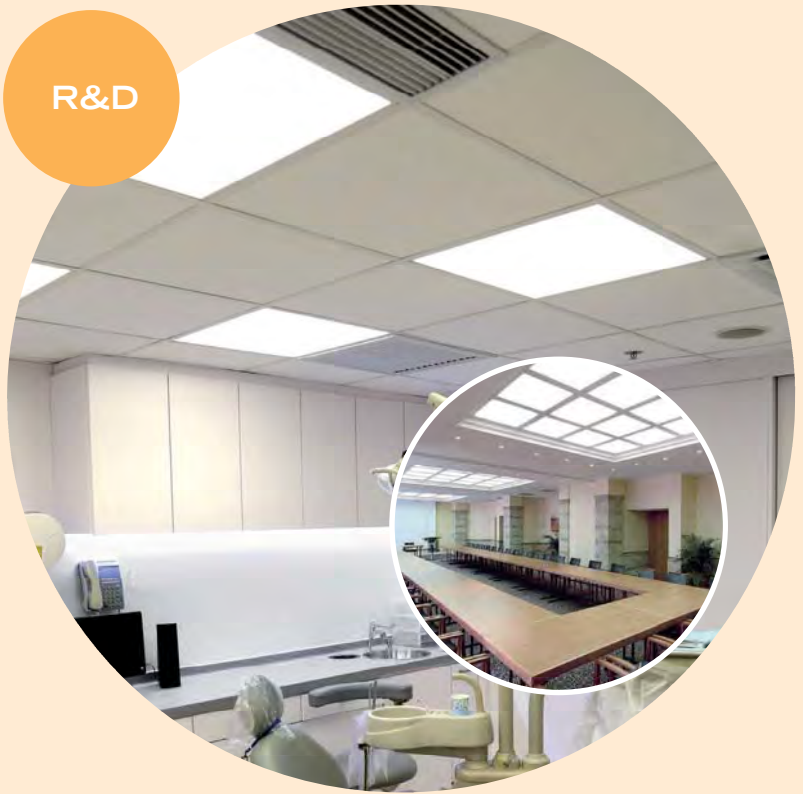
LED

The LED project involves developing large yet discreet aesthetically pleasing lighting panels to cover large surface areas.



This project concerns lighting and mood applications that integrate smart functional features to offer customers products that are easy to install and a snap to use. At the same time, its designs will meet customers' expectations optimally so as to carve out a place for its products on the extended light source market.

R&D



CONSORTIUM:

CRM | CE+T Technics | Gentec | Sirris | ULg | Arceo | SEREL Industries

MIRAGE

The MIRAGE project is built on the development of active surface coatings for better environmental management.



MIRAGE has led to the development of an innovative process using plasma technologies. This process consists in depositing very thin layers of coatings to give surfaces high-added-value functions.

The project has thus led to the development of many different types of application, such as self-cleansing surfaces, optical layers, anti-reflection layers that increase the transparency of glass panes, and even reflective materials to increase the performance of light fixtures.

Studies on surface functionalization have also been carried out with lasers.

The result? MIRAGE has given rise to a series of innovative products and processes for better environmental management through active (self-cleansing, luminescent, thermal solar, antibacterial, and other) surfaces.

R&D AND
TRAINING



CONSORTIUM:

ArcelorMittal | AGC Flatglass | Amos | BCT groupe Arcadis | CE+T Technics | CMI | CoRI | Coatings | CRM | ESE Solar | Lasea Materia Nova | Matrio | Nanoxid | Realco | Schreder | Technifutur | ULg/CSL | ULG | FPMS | UNamur | ULB | UMons | UCL | R-Tech | Sirris

NANOSOL

R&D

The aim of the NANOSOL project is to develop sol-gel dispersion and functionalization technology by means of industrially applicable nanomaterials.



Lighting systems that provide 50% more light for the same energy consumption, glass tables that will not scratch, new buildings that include metal claddings that are not only more resistant to mechanical attack but also offer peerless aesthetics and design...

These are just some of the opportunities that marrying nanomaterials and surface coating technologies offers. Enriching surfaces and objects of daily use with innovative functional features is what the Nanosol project wants to do for the Walloon Region.



CONSORTIUM:

AGC Glass Europe | ArcelorMittal | Arceo | Materia Nova | UMONS | UNamur | Ionics | CRM

OLED

R&D

The aim of the Ecolighting OLED project is to develop innovative components usable for making new-generation OLEDs (Organic Light Emitting Diodes).



These planar light sources, which are found in rigid, curved, and flexible forms, offer an infinite range of design and architectural possibilities.

The project will culminate in no less than the creation of a new industry with a great diversity of applications that will feed a new segment of the lighting industry.



CONSORTIUM:

AC&CS | AGC | Solvay | CE+T Technics | Taipro | Lasea | Materia Nova | ULg | UNamur | UCL

RABISEAU

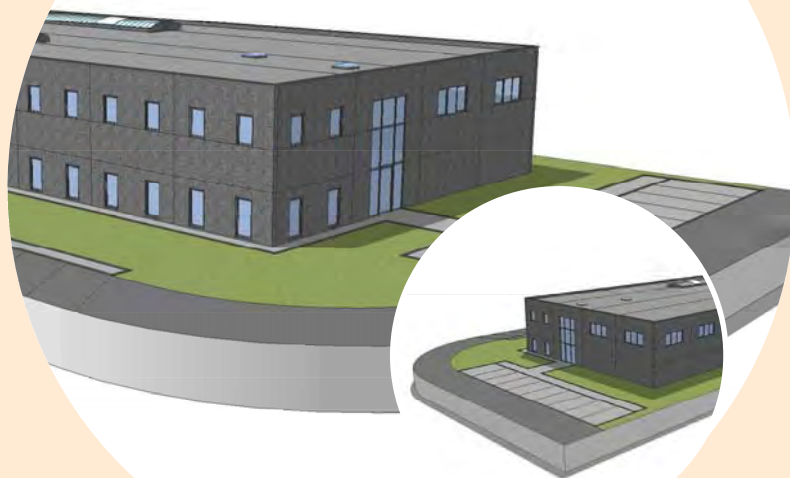
INVESTMENT

The RABISEAU project consists of the construction of a 1200 square meter building on a 35-acre site in the north of the Charleroi region (Martinrou Industrial Park, Fleurus).



Diarotech, which has been operating for more than 10 years the buildings of the Héraclès Business Center in Gilly, started this construction project in 2015 within a suitable industrial zone.

The building will be built according to the latest technologies in terms of energy. It will be a passive building on 2 levels: 800 m² of workshops and 400 m² of offices.



SAVE

R&D

SAVE is a project to develop a stand-alone, generic embedded system/onboard device for vision.



The availability of embedded systems and onboard devices equipped with various types of sensor, wireless connectivity, networking features, and smart processing abilities opens the gates to a flood of innovative services and the ability to tackle problems that were heretofore impossible or extremely expensive to address.

The SAVE module includes very-low-energy hardware for image capture and processing and a set of analytical algorithms developed specifically for the onboard/embedded context. The SAVE module will be a promising platform for implementing viewing applications for low-to-moderate image frame rates.

The project will provide material illustrations of this technology through two applications:

- ▶ optical readings of meters (smart metering) and
- ▶ road traffic surveillance.

CONSORTIUM:

Deltatec | RVC | ACIC | CETIC | UCL | NSilition



SILENTHALPIC

This project aims to develop a decentralized dual-flow ventilation technology in the ventilation market of residential and small-scale buildings, both in renovation and new construction.



This project should fulfill 3 essential objectives:

- the improvement of acoustic performances at higher flow rates
- the simultaneous recovery of heat and humidity, in particular, to provide a solution to the problem of condensate evacuation and resistance to low temperatures
- the overall management of the ventilation of the building as a system from several decentralized units, which may prove to be modular, in particular, in accordance with financial needs of the users.

R&D



CONSORTIUM:

Any-Shape | Cenaero | Certech | CSTC | Greencom Dev. | MSC Software | Nano4 | ThingsPlay | ULg

UPS GREEN

IEM Power Systems SA, a company specializing in dynamic UPS, confirms its anchorage in Belgium, by equipping itself with a building of 1775 m², intended to ensure the production of its machines.



The development of innovative new generations of machines is also entrusted to the engineering teams in Liege, responsible for designing and testing these new products.

INVEST-
MENT



CONSORTIUM:

IEM Power Systems

VIWI is developing a wireless active glass pane that is controlled thanks to the information received by integrated sensors or a radio-frequency (RF) module which communicates with the user or Building Management System

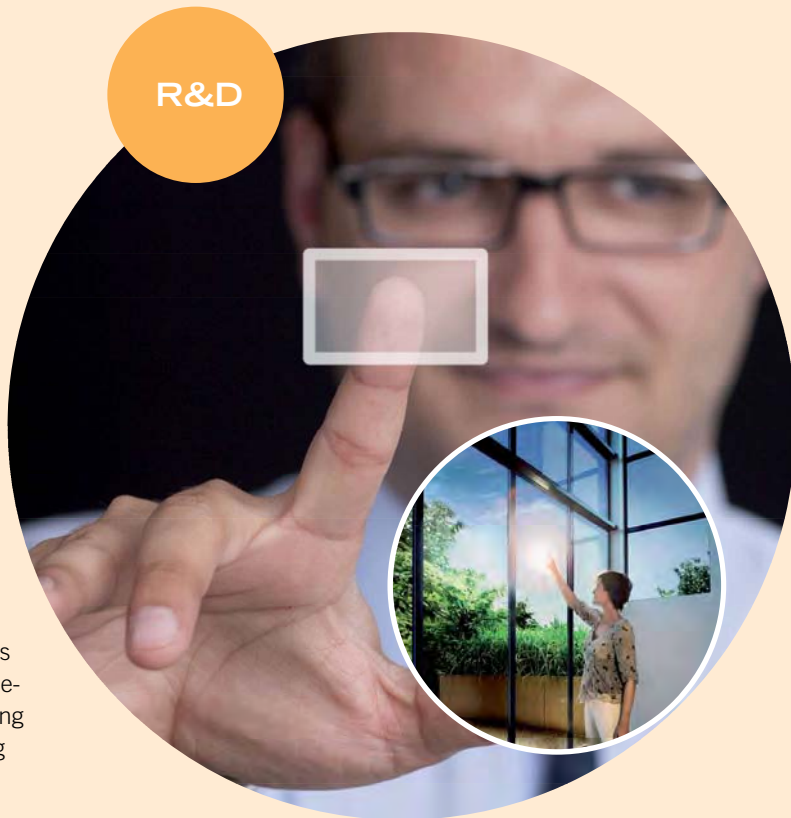


This project is aimed at adding an innovation to the energy management of buildings by proposing to implement a stand-alone management system in a building element that is systematically found in buildings, namely, one or more double-glazed window panes. Home automation and dynamic building control solutions will become more widespread in the coming years to enhance the energy performance of buildings.

CONSORTIUM:

AGC Glass Europe | Nomics | UCL | ULg | Taipro Engineering

R&D





HEALTHCARE & WELL-BEING

CARMAPHARM

CARMAPHARM is a project aimed at developing a new generation of drugs that will revolutionize the treatment of certain diseases.



The first medicines were found in nature, notably from the yew tree in the case of cancer drugs, but also in molds in the case of antibiotics. Next, humans designed and synthesized drugs – usually small molecules – in the chemistry lab. Thanks to the biotechnology revolution, a new generation of therapeutic agents has been born. It includes the use of monoclonal recombinant antibodies. The latter make it possible to treat the most serious diseases while limiting the magnitude of the treatment's adverse effects. Unfortunately, these new drugs are expensive to make. The aim of this project is thus to develop new materials to produce and purify synthetic antibody more cheaply thanks to recent progress in microfluidics and precision machining.

CONSORTIUM:

Mecasoft | UCB BioPharma | E-Protein | ULB | ULG



EASYS

The EASYS project is aimed at developing a differential dosing pump for the pharmaceutical industry.



This pump must meet the following requirements: great accuracy, able to be cleaned and sterilized in situ, a small number of parts, light-weight, and easy to handle in a sterile environment.

To meet these criteria, EASYS has developed two technologies:

- ▶ overmolding the pump's body with a polymer encapsulating the ceramic working part of the pump;
- ▶ the technology for milling and matching the parts of differential pumps, which have active components of two different diameters that are matched simultaneously.

The result?

This project has led to the development of overmolding and differential matching technologies for clients around the world.



ECOLAS

The ECOLAS project intends to develop ecological laser applications. The aim is to develop innovative, environmentally-friendly applications based on laser diode and fiber laser technologies.



These new technologies open the door to new types of lasers (fiber lasers) and new industrial applications (plastic welding, marking, micro-tooling, etc.) thanks to their very-high-quality beams, low cost, and great reliability.

The ECOLAS project proposes to apply these technologies to material treatments (which continue to be dominated by conventional technologies) and develop new sources and interfaces to solve problems linked to specific applications.

The result?

This project has produced solutions for specific needs in Wallonia in the areas of plastic welding (LED lighting), direct marking (medical instruments, marking bottles at the rate of 600 a minute), and micro-tooling.

CONSORTIUM:

BEA | Lasea | KS Techniques | Plastiqueal | Matrio | ESE | UCL | Sirris | Multitel | Technifutur

R&D AND
TRAINING



E-PATCH

The E-PATCH project consists in developing an electronic patch to geolocate and detect falls by people who have deteriorated mentally (memory disorders, dementia, Alzheimer's, cognitive disorders, etc.)



This innovative technological tool is an intelligent electronic patch that can detect falls reliably, locate the person wearing it, and communicate remotely and automatically the information that is required for quick and effective action.

The advantages? The fact that it is located on the wearer's bust limits the "false positive" signals of falls. It is also less noticeable than a box worn on the wrist or at the waist.

R&D



CONSORTIUM:

Nomics | Cetic | Centexbel | Sioen Fabrics

LEGOMEDIC

R&D

LEGOMEDIC is an ambitious, novel project to develop and optimize holistically (technology/design, materials, and operating conditions) new continuous integrated microfluid processes to produce molecules of pharmaceutical interest.



These new processes make possible:

- ▶ the production of new chemicals through several consecutive reactions followed by purification and crystallization steps;
- ▶ the purification of new biomolecules; and
- ▶ in situ delivery of hazardous matters (a solution that administrations and the neighbors of industrial sites await eagerly: lowering of the SEVESO II threshold and REACH compliance).

CONSORTIUM:

UCB BioPharma | Mecasoft | Technord Automation | Taipro Engineering | ULg | ULB | UNamur



LIONEL

R&D,
INVESTMENT,
AND
TRAINING

Under LIONEL project, the company Physiol has developed, in conjunction with ULg, and patented a new type of hybrid material for making soft intra-ocular lenses with which the standard manufacturing process is not compatible.



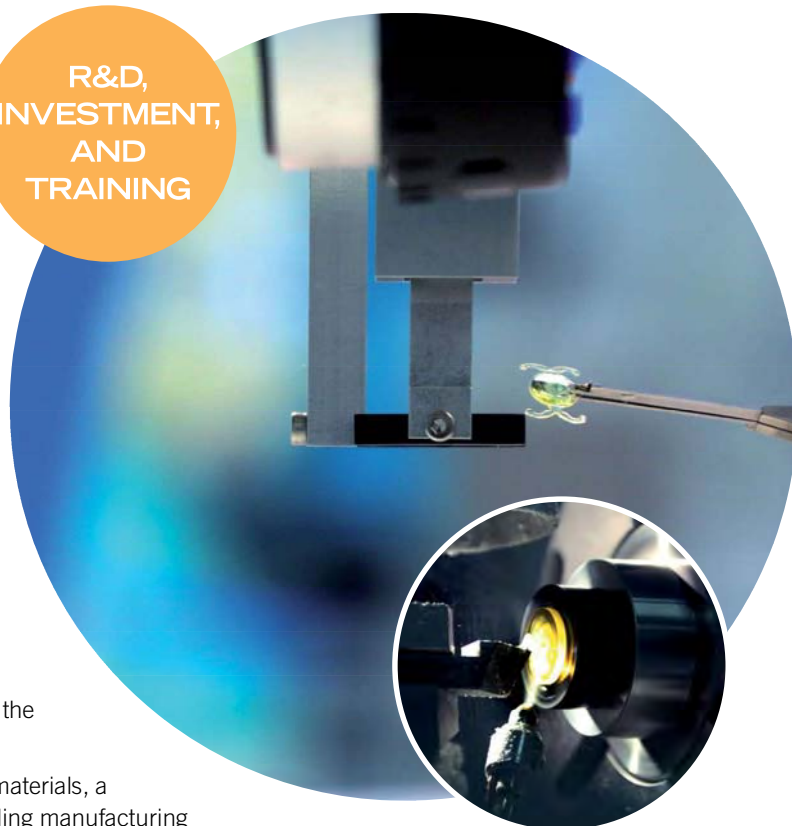
The LIONEL project concerns the development of an innovative process of submicronic precision designed primarily for manufacturing intra-ocular lenses but adaptable to other micro-objects.

These soft intra-ocular lenses, which are distributed in 48 countries, replace the eye's natural lens and serve as implants for people with cataracts. With an annual output of 200,000 lenses, Physiol is competing with the big names in the pharmaceutical industry.

The result? This project has led to the development of new materials, a new multifocal optical implant design, and a new micromolding manufacturing process for a new generation of intra-ocular lenses that accounts for 45% of the company's turnover.

CONSORTIUM:

Physiol | Amos | Open Engineering | Lambda-X | Optim Test Center | Sirris | Technifutur | ULg



NEOCERAM

INVEST-
MENT

NEOCERAM is a 2 million-euro, five-year investment program (from the start of 2010 to the end of 2014).



This project is the continuation of a first 1,400,000-euro investment program that MecaTech CC selected in its third call for projects.

In parallel with the investment program, NEOCERAM is continuing to develop its new generation of overmolded and/or differential dosing pumps.



PICABO

R&D

The PICABO project aims to improve transfusion safety through a new patented technology.



Antigone, the new spinoff of the ULB, is developing in the global level a new Point of Care Testing device, which is simple to use, allowing the nursing staff to check the consistency, with total reliability, between the blood group ABO of a patient and the one of the blood bag destined for it.

This unique new system will instantly offer double checking - electronic against the blood bank file and analytical by performing ABO tests of the patient and the blood bag - at the patient's bedside. This will help to significantly reduce the risk of ABO incompatibility at the time of transfusion of the patient.



CONSORTIUM:

Wow Technology | Microbelcaps | SIRRIS | Laboratoires d'Immuno-Hematologie et de Microfluidique de l'ULB | BT Life Sciences

RPI

RPI is a project to develop a solution for the real-time monitoring of patient movements applied to proton beam therapy.



This project takes advantage of the intelligence and technology of two Walloon products that have proven their technological value to give rise to a new function.

More broadly, it benefits from the complementarity of its industrial and academic partners in order to propose innovative solutions for treating mobile tumors (basically lung cancers).

The result?

The project has made it possible to optimize treatment strategies by using several methods (patient clinical coaching, interfacing (UBTI) with respiratory monitoring devices, blocking & gating, etc.).

CONSORTIUM:

IBA | Nomics | UCL | ULg



R&D

WIN GTR

The aim of the WIN-GTR project is to develop a less expensive technological solution to make proton beam therapy accessible to the largest possible number of cancer patients.



One of the main components – the compact gantry – is a system for moving the proton beam around the patient.

This project, which stems from the synergy between AMOS (a specialist in designing and manufacturing optical, mechanical, and opto-mechanical systems) and IBA (leader in the area of proton beam therapy), is pursuing several objectives: to make a full demonstrator of the compact gantry, design and carry out all of the factory tests, develop the equipment and methods needed to optimize production, and develop and assess a digital model.

The result?

The project has led to the development of a compact proton beam therapy solution, Proteus, a first unit of which has already been set up on a client site. In future, the Proteus will be one of the IBA Group's leading products.



R&D

CONSORTIUM:

IBA | ALM | Aeriane | UCL | Sirris

INDUSTRY



CALFDM

The CALFDM project aims to develop a simulation and characterization software to evaluate the mechanical properties and to ensure the functional resistance of components manufactured in 3D printing.



The process of additive manufacture by deposition of molten wire (FDM), also called 3D printing, is today commonly recognized as an integral part of a new industrial revolution. This procedure is complementary to conventional methods because it makes it possible to address geometries that cannot be realized by molding and manufacturing and to be able to manufacture parts without tools. Additive manufacturing of great potential profits in turnaround time and in final product costs.

However, the adoption of this technology for high value-added mechanical parts in the Aerospace, Defense, Industry and Automotive sectors is prevented by the lack of sizing means, allowing to predict the mechanical behavior of the produced parts.

CONSORTIUM:

E-Xstream engineering | ADDIPARTS | Cenaero | Materia Nova

R&D



COMP2BLADES

Fairwind's approach in the context of the COMP2BLADES project is in line with the general context in terms of the need for renewable energy and the trends observed in the wind small turbines market.



The European Directive (2009/28 / EC) imposes 13% renewable energy in the Belgian energy mix in 2020. And by 2030, a new European aim will target at least 27% of renewable energy in the EU energy. These targets bring the share of the On-Shore wind sector projected by the Walloon Government to 680 GWh and 4403 GWh respectively for the years 2020 and 2030. Fairwind began the commercialization of its products in 2012 (14 machines installed with feedback experience of 3 years) and is currently working to strengthen its sales force in Belgium and abroad.

CONSORTIUM:

Aerofleet | Cenaero | Fairwind | Isomatex | Centexbel

R&D



DEQUENNE

The DEQUENNE project is focused on manufacturing and marketing activated alumina gels and sols and aluminum oxides.



The production of these high-purity alumina compounds uses raw materials that are manufactured by the parent company, Dequachim.

The gels, sols, activated alumina, and calcined alumina are intended primarily for the production of catalysts, abrasives, papers with special coatings for printing, etc.

The result?

This project has resulted in the development of a new site for Dequenne Chimie.

INVEST-
MENT



ECO2ICE

The ECO2ICE project consists in developing and marketing a new dry ice pelletizer.



The machine's main innovations are a reduction in CO₂ consumption (a more than 60% reduction to produce the dry ice) and improvements in the dry ice's quality (more compact, harder, and thus longer lasting).

ECO2ICE's technological and ecological advances also make it possible to improve the ECO2CLEAN machine (patented in 2000), which offers a very hi-tech and ecological industrial cleaning method.

The result?

This project has resulted in a new dry ice production process and two "proof of concept" machines based on this process.

R&D AND
TRAINING



CONSORTIUM:

Advanced Technologies | WOW Company | ULg | UCL

ECOLAS

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CONSORTIUM:

BEA | Lasea | KS Techniques | Plastiqua | Matrio | ESE | UCL | Sirris | Multitel | Technifutur

R&D AND
TRAINING



FIAMA

The aim of the FIAMA project is to develop an automatic remote diagnostic platform for rotating machinery.



FIAMA stands for “fiabilisation des machines tournantes” or ensuring the reliability of rotating machinery. The aim of this platform is continuously to take measurements (vibrations, thermography, product/process information, etc.), collect and send data to a centralized server, and analyze the data in order to determine the machinery's long-term behavior and detect potential failures as early as possible. Such continuous analysis makes it possible to optimize the maintenance strategy.

The result?

A functional online remote diagnostic prototype that has been validated on two industrial machines.

R&D AND
TRAINING



CONSORTIUM:

Maintenance Partners | Pepite | Demsy | Technofutur Industrie | FPMs/Pôle Risques | FSAGx/Unité de mécanique et construction | FUCAM

INTELLIGENT MAINTENANCE TRAINING

The aim of this “intelligent maintenance strand” training project is to create conditions conducive to integrating intelligent maintenance principles in Walloon enterprises’ operations.



This training covers all aspects of intelligent maintenance: data collection (sensors, instruments, and robots), data transmission, data validation, expert systems for diagnosing breakdowns, and more.

The target audience is multifold: workers in the sectors concerned, jobseekers, technical school teachers and students, and students in universities and higher institutes.

SKILLS CENTER:

Technifutur

TRAINING



MATERIALS TRAINING

The aim of this “intelligent maintenance strand” training project is to create conditions conducive to integrating intelligent maintenance principles in Walloon enterprises’ operations.



This training covers all aspects of intelligent maintenance: data collection (sensors, instruments, and robots), data transmission, data validation, expert systems for diagnosing breakdowns, and more.

The target audience is multifold: workers in the sectors concerned, jobseekers, technical school teachers and students, and students in universities and higher institutes.

TRAINING



SKILLS CENTER:

Technifutur

HIPAC

The aim of the HIPAC project is to develop new high-temperature encapsulation technologies for power electronic components, e.g., welding or fritting chips or substrates and silicone gels to protect chips.



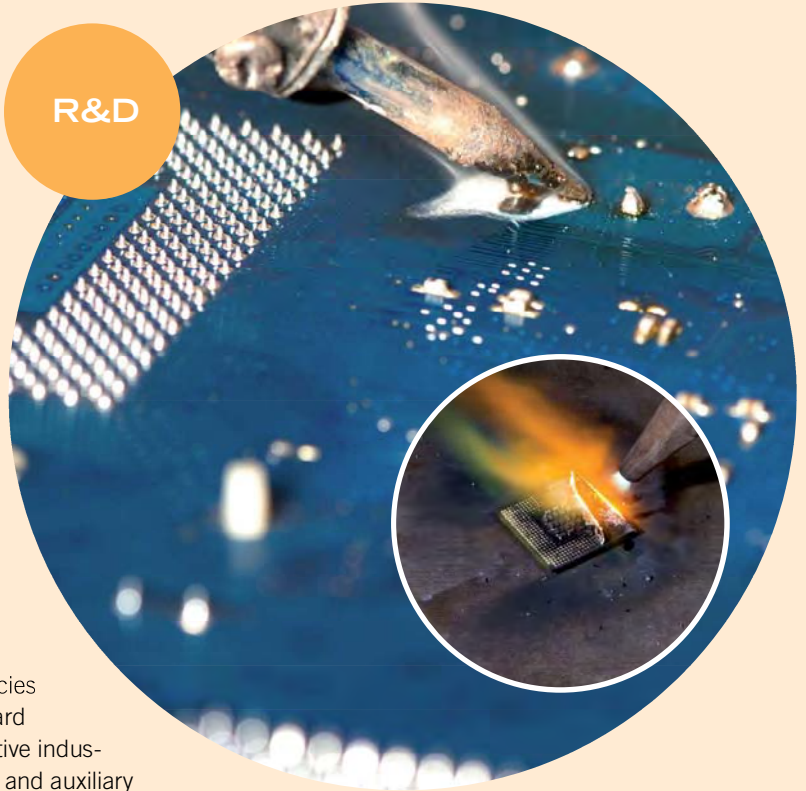
The components will be based on the new high-speed semiconductor arrays of silica carbide (SiC) and gallium nitride (GaN), which function at extreme temperatures with low switching losses.

These arrays make it possible to increase the energy efficiencies of power conversion systems and reduce the weight of onboard converters in aeronautics (more electric planes), the automotive industry (electric and hybrid vehicles), and trains (traction inverter and auxiliary converters).

CONSORTIUM:

Cissoïd | Dow Corning | UCL-IMAP | Cenearo

R&D



LORA-SENSE

The LoRa-SENSE project aims to develop new industrial tools without autonomous wireless, intelligent and modular for predictive maintenance, environmental monitoring and industrial equipment monitoring applications.



The project will last for 3 years to ensure wireless communications in industry, or to develop smart sensors with low energy consumption. Demonstrators and industrial prevalidation will be implemented in the cement sector and the wind sector. This project also aims at the development of networks based on the LoRa standard, capable of responding to «hard» industrial constraints for radio transmission, such as strongly metallic or high burial environments.

CONSORTIUM:

Cerisic | I-Care | Micromega Dynamics | MoDyVa | Multitel

R&D



MAGAL

The aims of the FAST 3D-MAGAL project are to master the new thixomolding technology for magnesium and select a single technology for processing aluminum.



Thixomolding is working metals in a semisolid state comparable to that of butter. This innovative technique saves subsequent machining time.

The project also intends to set up a company that will use these new technologies in order to conquer new European markets.

The result?

The project has led to improvements in the aluminum rheocasting process (in the industrialization phase) and mastery of magnesium thixomolding processes.

CONSORTIUM:

Mag&Al Technologies | FN Herstal | Fonderie Fallais | Sirris | Technifutur | Technofutur Industrie | ULg

R&D,
INVESTMENT,
AND
TRAINING



MICROLAB

To solve problems related to microfluidic techniques, MICROLAB intends to create a complete biochip via a fully automated and flexible demonstrator.



MICROLAB develops two sub-units, based only on laser technology and assisted by simulation:

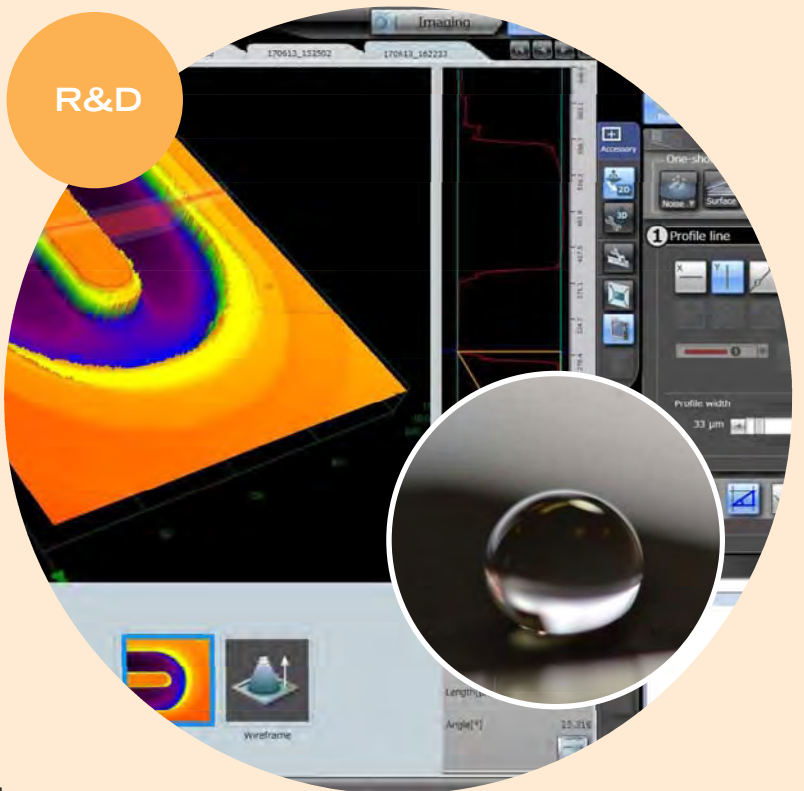
- creation of complex designs and operations in order to improve the flows in the micro channels and optimize the biological processes
- improvement of chips sealing.

The integration of sensors in the micro channels will also improve the injection molds and control in real time the characteristics of the flows.

CONSORTIUM:

Cenaero | Citius Engineering | Coris BioConcept | Femto Laser Services | Lasea | Sirris | Multitel

R&D



MINT

The aim of the MINT project is to develop cheap expert maintenance systems for continuous manufacturing processes.



These systems must make maintenance operations more effective by using the opportunities offered by new technologies to increase their reliability, availability, performance, and safety, while optimizing maintenance costs.

The result?

This project has developed five innovative products and services dedicated to intelligent maintenance.

R&D AND
TRAINING



CONSORTIUM:

Arcelor-Mittal | CMI | CRM | PEPiTe | Synthetis Metals | V2i | CRM | UMONS | ULB | ULg

MIRAGE

The MIRAGE project is built on the development of active surface coatings for better environmental management.



MIRAGE has led to the development of an innovative process using plasma technologies. This process consists in depositing very thin layers of coatings to give surfaces high-added-value functions.

The project has thus led to the development of many different types of application, such as self-cleansing surfaces, optical layers, anti-reflection layers that increase the transparency of glass panes, and even reflective materials to increase the performance of light fixtures.

Studies on surface functionalization have also been carried out with lasers.

The result? MIRAGE has given rise to a series of innovative products and processes for better environmental management through active (self-cleansing, luminescent, thermal solar, antibacterial, and other) surfaces.

R&D AND
TRAINING



CONSORTIUM:

ArcelorMittal | AGC Flatglass | Amos | BCT groupe Arcadis | CE+T Technics | CMI | CoRI | Coatings | CRM | ESE Solar | Lasea Materia Nova | Matrio | Nanoxid | Realco | Schreder | Technifutur | ULg/CSL | ULG | FPMS | UNamur | ULB | UMons | UCL | R-Tech | Sirris

NANOCOMPO

NANOCOMPO is a project aimed at ensuring the vertical integration of carbon nanotubes to boost the development of derivative final products and develop new generations of products that take advantage of all nanoparticles and Wallonia's nanotechnology expertise.



The project fostered the pooling of Walloon expertise in nanotechnologies as the industry kicked off. The first industrial carbon nanotube synthesis reactor, with a capacity of 40 metric tons per year, began operating in 2007. Nanocyl SA's production capacity rose steadily thereafter to hit 400 metric tons/year at the end of 2010.

The result? The creation of a technology platform for the development of nanocomposites in Wallonia.

R&D



CONSORTIUM:

Nanocyl | ESE | e-Xstream | MC technics | Eurodye | Beads Belgium | Plack-O-Plast | BFB Certech | Sirris | Centexbel | Optim Test Center | UCL | ULg | UMH | FUNDP | ULB | Dequenne Chimie

NANOSOL

The aim of the NANOSOL project is to develop sol-gel dispersion and functionalization technology by means of industrially applicable nanomaterials.



Lighting systems that provide 50% more light for the same energy consumption, glass tables that will not scratch, new buildings that include metal claddings that are not only more resistant to mechanical attack but also offer peerless aesthetics and design...

These are just some of the opportunities that marrying nanomaterials and surface coating technologies offers. Enriching surfaces and objects of daily use with innovative functional features is what the Nanosol project wants to do for the Walloon Region.

R&D



CONSORTIUM:

AGC Glass Europe | ArcelorMittal | Arceo | Materia Nova | UMONS | UNamur | Ionics | CRM

NANOTECH

The NANOTECH project is about creating a single platform in Europe in the area of nanopowder synthesis.



The project's aims are as follows:

- ▶ To boost the use of nanopowders in Wallonia.
- ▶ To produce and sell consistent nanopowders by means of the atmospheric plasma process.
- ▶ To build and sell nanopowder production lines (carbide, oxide, and pure and passivated metal nanopowders) via the plasma process.

R&D AND
TRAINING



CONSORTIUM:

Aseptic Technologies | Diarotech | General Metal Alloys | IRA | Magotteaux | Open Engineering | Sirris | Technofutur Industrie
Technord Automation | UCL/ Imap | VKI | Nanopôle

PROCESS

PROCESS is a huge 3,5000,000-euro investment project initiated by the cable-manufacturing company Lemmens to develop new hoisting and handling equipment production plant and customized tarpaulin and tent manufacturing plant.



Under its fourth generation of owners, Lemmens has thrown itself into a new project of magnitude, namely, moving the company to Damré Industrial Park in Sprimont and developing new products. This new facility will be better able to carry out its various activities and house more powerful production plant, thereby improving the quality of its services and working conditions even more. (Some cable-manufacturing techniques involve great physical effort.)

INVEST-
MENT



ROMISY

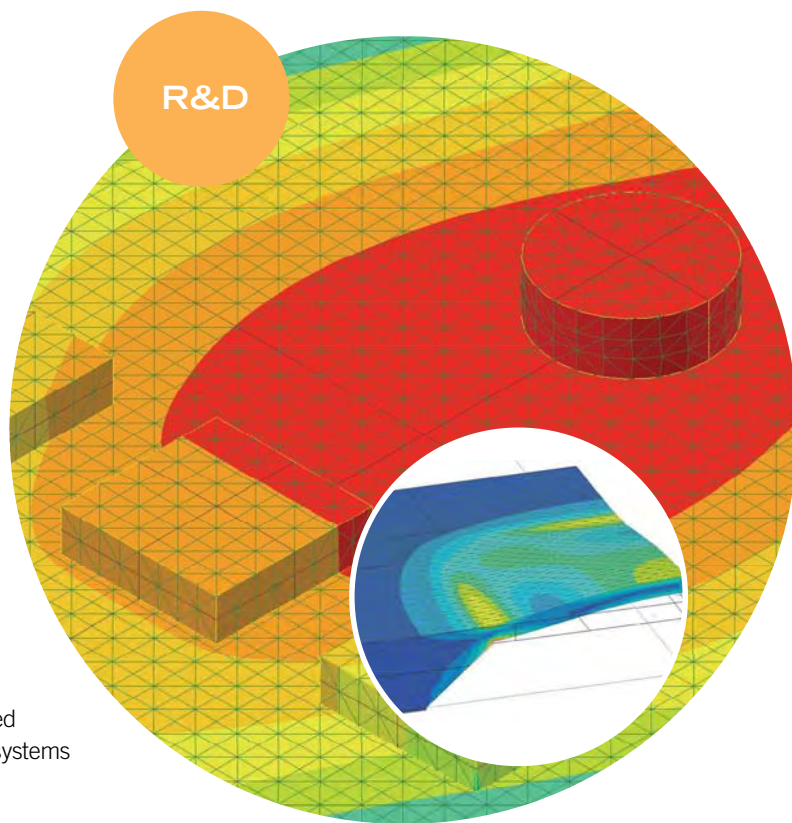
The ROMISY project is aimed at making 3D microsystems more robust.



The growing use of micro-electro-mechanical systems (MEMs) in classic actuator and sensor markets raises serious concerns regarding the systems' reliability.

The ROMISY project intends to answer these critical questions by designing a CAE (computer-aided engineering) tool that will allow for these reliability issues as of the first design phases.

The adaptation of these methods in a CAE tool will help win markets that, precisely because of the uncertainties mentioned above, had no other solution than to use very expensive test systems on their production lines.



CONSORTIUM:

Open Engineering | Cissoïd | LMS-Samtech | Taipro | ULg | UCL

SE

The SE (French for “Embedded Systems”) project provides innovative training in ES architectures, software tools, and sensors.



ESs are found in most of today's machines and industries, such as transport, industry, telecommunications, construction, health, sustainable development, security applications, etc.

The project's aims are to raise awareness, inform, and train enterprises on how to integrate and develop embedded systems in their activities.

This project is for

- ▶ all enterprises that are affected by the creation, integration, or maintenance of embedded systems and need innovative training for their personnel, and
- ▶ the higher institutes of learning (hautes écoles) that want to offer refresher courses and further training for teachers and students in these areas.

CONSORTIUM:

Technifutur | Taipro Engineering | Microsys/ULg | Thélis | Deltatec | Neomytic | Théoris | Haute École de la Province de Liège | Haute École de la Ville de Liège (ISET) | Haute École Libre Mosane | Haute École de la Communauté Française du Hainaut (ISIMs) | Haute École Robert Schuman

TRAINING



SILICALLOY

R&D,
INVESTMENT,
AND
TRAINING

SILICALLOY is a totally chrome-free treatment that gives galvanized surfaces good corrosion resistance and offers excellent adherence for subsequent coatings.



The original problem concerned the surface conversion of galvanized steel by chromium VI, which is toxic and carcinogenic.

The project has produced the first chromation replacement treatment to combine effectiveness and sustainable development through the use of proven non-toxic silica nanoparticles.

This treatment, dubbed “Silicalloy”, has been validated in the laboratory, on a pilot line, and on an industrial line for passivation from the galvanized to the tempered product.

It is also very promising for other processes and surfaces, such as reflector coatings for lights and the passivation of aluminum.



CONSORTIUM:

CMI | DeLeuze | UNamur | CRM | CoRI

INTER- COMPETITIVENESS CLUSTER INTERNSHIPS

TRAINING

The STAGE DES PÔLES is a training project to connect up Wallonia’s innovative enterprises and students in their last year of higher education in the Wallonia-Brussels Federation for an at least 12-week final internship.



This immersion in enterprises that are sources of economic activity in Wallonia will enable the students to develop a series of skills specific to industry and ultimately make it easier for them to find jobs.

Concretely, this project gives access to an interactive platform, www.stagesdespoles.be, that serves as a meeting place for internship offers and requests.



THERMAM

R&D

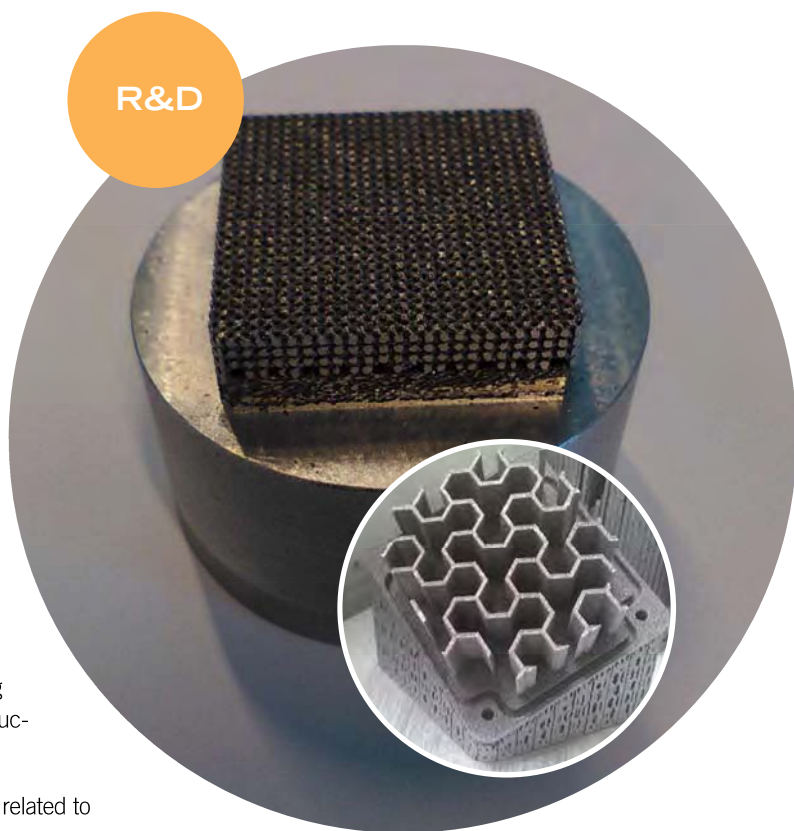
The biggest, potential innovation at Thales Alenia Space Belgium is the material addition technology. This is the purpose of the THERMAM project.



Three areas of activity interact in this project: additive manufacturing (3D printing), thermal management and mechanical design of support structures for electronic circuits in a space environment.

This project will make it possible to defy the additive manufacturing technologies, in particular, by the realization of porous and solid structures in a severe application environment.

Innovations are expected in cooling techniques and improvements related to additive manufacturing.



CONSORTIUM:

Capaul | Euro Heat Pipes | ULB / Microgravity Research Center | SIRRIS | Thales Alenia Space

THIXOACIER

R&D AND
TRAINING

The THIXOACIER project involves the manufacturing of quasi-finished three-dimensional steel parts by thixoforming.



The aims?

- ▶ shaping parts that meet the needs of the automotive, transport, and arms sectors by means of a thixoforming process
- ▶ developing regional know-how

The result?

This project has proven the feasibility of producing the thixotropic raw material in the crude casting state.



CONSORTIUM:

Sirris | Marichal Ketin | CRM | ULg | CRIBC

THIXOWAL

R&D

THIXOWAL was set up to achieve the technically and economically viable industrialization of the thixoforming process.

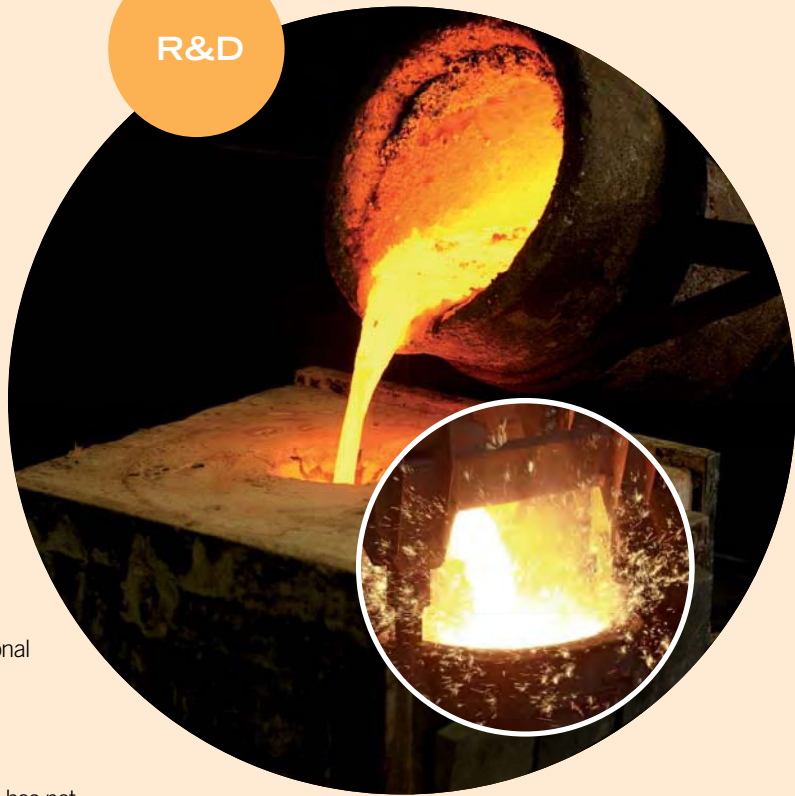


The aim is to be present along the entire value chain by making use of casting, forming, simulation, optimization and experimental validation (ULg), design and manufacturing of forming plant, and industrial validation technologies.

The THIXOWAL project is a direct descendant of the THIOXACIER project (first call for projects). Thanks to the major investments made in the past three years, Wallonia is now an international center of expertise in the thixoforming of steel

The result?

The project has not yet culminated in the industrialization of the steel thixoforming process, despite its proven feasibility in earlier phases. It has not been possible to control the aging of the plant.



CONSORTIUM:

Marichal Kélin | FN Herstal | Jtekt Torsen | Precical | Tecnolub | ULG | CRM | Sirris

VIRTUOSO

R&D

VIRTUOSO's aim is to design tools for operational excellence.



Specifically, the project is aimed at designing a tool for the mathematical optimization of industrial processes; NO_x, SO_x, and CO_x sensors with IR spectroscopy readings; and collaborative process management software that includes the running of operations through the constant real-time broadcasting of relevant information.



CONSORTIUM:

AGC Glass Europe | CMI | LaserSpec | Multitel | NSI | Pepite | Segal | Stratic | Technifutur | UCL | ULg

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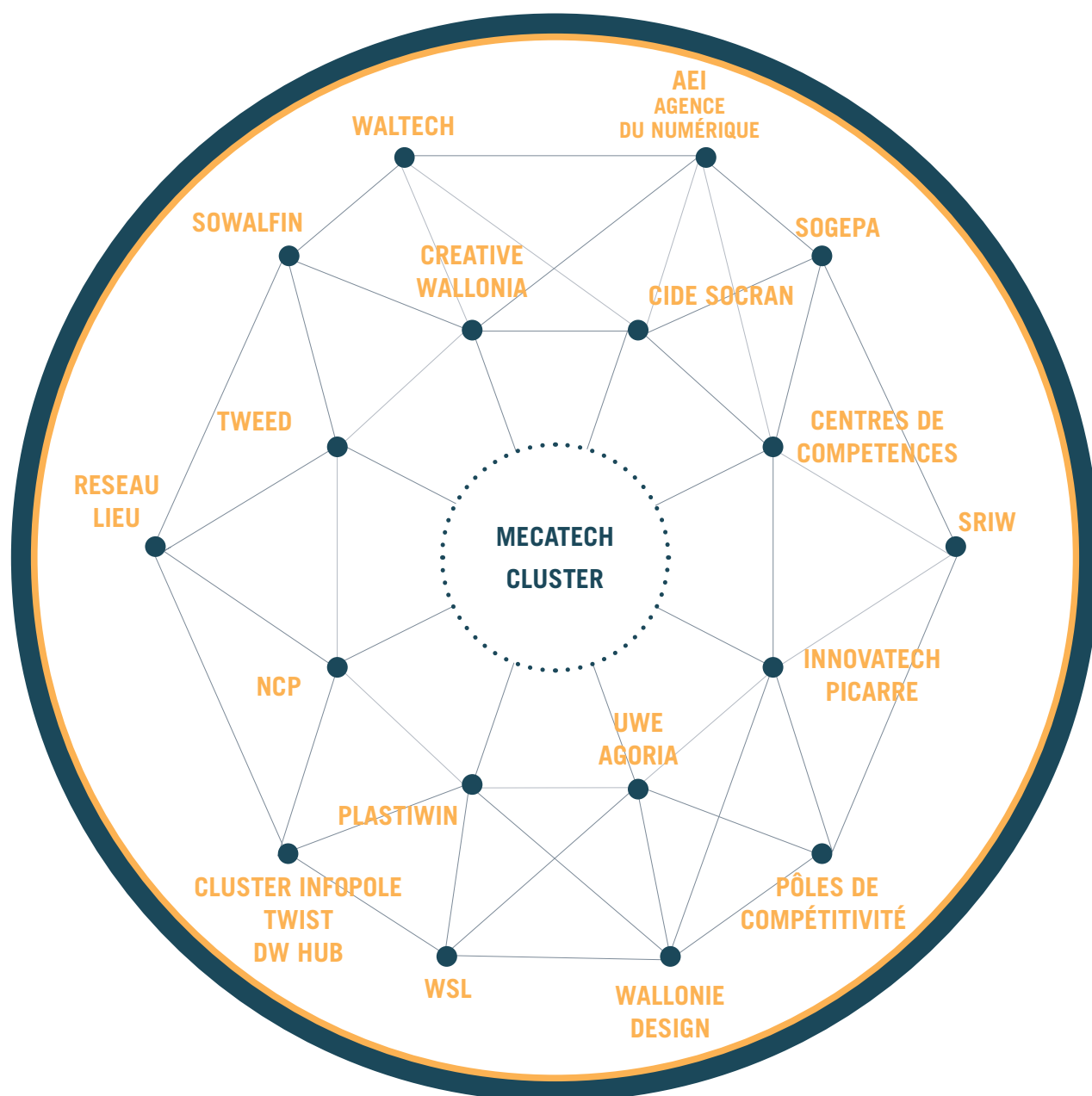
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PARTNERS

The strategy of the MecaTech Cluster has always been to rely on the Walloon ecosystem. MecaTech continues to strengthen its positioning by forging new strategic partnerships with the Walloon ecosystem.





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