Feel inspired

Wallonia.be

GREEN WIN

FROM INNOVATION TO BUSINESS

HANDBOOK

GREENWIN HANDBOOK | December 2019 edition
Editor-in-chief: Véronique GRAFF, *Managing Director, GreenWin*
Maison de l'Industrie . Rue Auguste Piccard, 20 . B-6041Gosselies . Belgium
Tél. +32 (0) 2 771 00 25 . contact@greenwin.be . www.greenwin.be

TABLE OF CONTENTS

Feel inspired

Wallonia.be

CONTACTS :

Projects :
Leslie DESCAMPS
Innovation Project Manager
leslie.descamps@greenwin.be
+32(0)497 810 626

International :
Gilles COLSON
Head of International Affairs & Marketing
gilles.colson@greenwin.be
+32(0)485 317 717

WORDS FROM THE CHAIRMAN AND THE MANAGING DIRECTOR:

GREENWIN,

#BecauseTheFutureIsNow!

The GreenWin cluster is the Walloon innovation cluster that is dedicated to collaborative innovation projects in the three areas of green chemistry, innovative building materials and processes, and the environment.

In a world where resources and their access are, by nature, limited, the **GreenWin** innovation cluster was set up in 2011 with the aim of contributing, through industrial innovation, to the most crucial societal needs and issues of this century:

- making the most of limited resources by reducing energy-related and environmental impacts as much as possible, whilst at the same time maintaining the economic value of products;
- finding concrete solutions to the economic and environmental challenges that our region, and also our planet, face;
- creating the conditions for a development that is balanced, sustainable and responsible, in a context that is in constant evolution, if not effervescence;
- transforming threats into opportunities;
- adapting our industrial model so that it can develop in an environment that is in complete (r)evolution, namely:
    - **a transition towards a low carbon economy**, a path strewn with pitfalls and unknowns;
    - **an evolution towards circular practices**, allowing the economic value of products and resources to be maintained over time while minimising the production of waste (notably through eco-design);
    - **a digital transition**, a delay in the adoption of which can expose industries to significant loss of competitiveness.
- taking into account global warming, which requires changes in behaviour as well as in approaches to production and consumption…

GreenWin has firmly given itself the mission to « engineer encounters that open up the innovative paths of the future »:

It is an accelerator of innovative and collaborative industrial projects.

IT **GATHERS TOGETHER DIFFERENT PROTAGONISTS FROM THE WORLDS OF ECONOMICS AND ACADEMIA** IN ORDER TO **BRING ABOUT, AND IMPLEMENT, THE TECHNOLOGICAL INNOVATIONS ABLE TO GENERATE REGIONAL ECONOMIC DEVELOPMENT.**

GREENWIN'S RAISON D'ÊTRE IS TO **CONTRIBUTE TO THE DEVELOPMENT OF A PROSPEROUS, SUSTAINABLE AND RESPONSIBLE INDUSTRY IN WALLONIA.**

GREENWIN TODAY

CREATIVITY • RESPONSIBILITY • FREEDOM • ENGAGEMENT • DARING

RAISON D'ÊTRE	VISION	MISSION
Contribute to the development of aprosperous, sustainable and responsible Walloon industry	REFERENCE: prospection partnerships industrial innovation projects	Engineer encounters to open up the innovative paths of the future

TOWARDS A SUCCESSFUL AND SUSTAINABLE INDUSTRIAL AND ECONOMIC TRANSITION IN WALLONIA

By virtue of its very raison d'être, **GreenWin** contributes to boosting employment prospects and safeguarding and creating new direct and indirect jobs within the three sectors with which it is concerned.

It provides access to **funding, to advice, and to a network** of partners, allowing for the development and implementation of industrial projects that are innovative and collaborative.

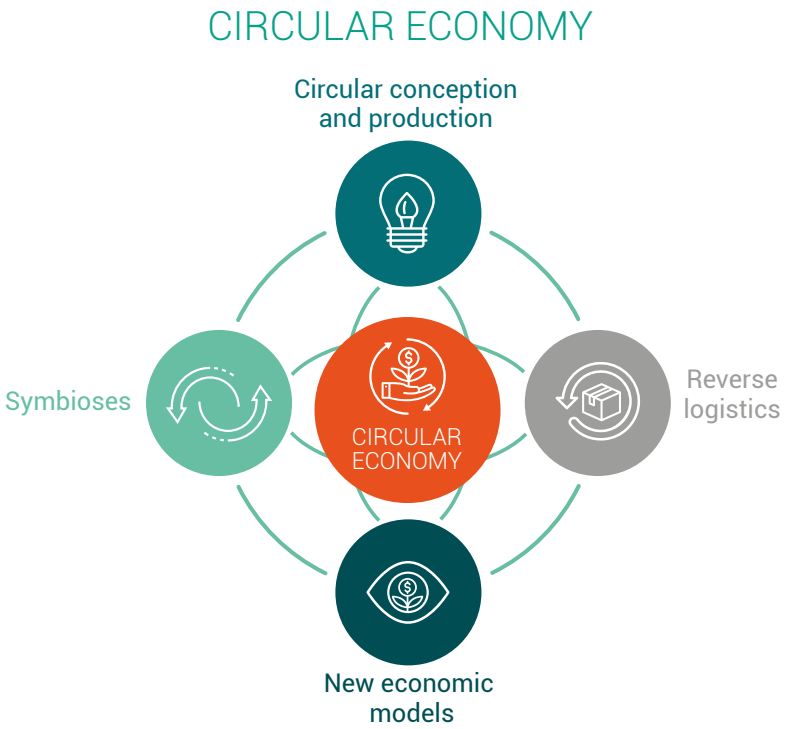
It also constitutes a network that encourages the **valorisation of innovations that are created within the framework of the cluster's projects**.

It provides access to a number of major players (companies, universities, university colleges, research centres…) who share the same common denominator: **the resolve to innovate and contribute to the management and proactive support of their own economic, environmental and societal developments, in a sustainable and responsible manner, in Wallonia**.

In addition, the cluster also facilitates a number of unlikely meetings, invariably enriched by the compatibility of the partners and participants that are brought together.

A transition that is both sustainable **and** responsible

Life cycle analysis, the analysis of climate risk, the circular economy, carbon neutrality and digital transition all lie at the very heart of the projects that **GreenWin** supports in the **three relevant sectors** in which it is active, namely **CHEMISTRY, CONSTRUCTION AND THE ENVIRONMENT.**



The aim of this «GreenWin Handbook» is to very concretely highlight the large potential offered by the projects supported by **GreenWin** and by its near 200 Members. The format chosen will allow for you to go though it easily and exploit it according to the priorities of interest to you.

We hope that you will enjoy reading it and that it will become an indispensable information and inspirational tool, serving as it does three of the largest sectors of our economy.

Marc VAN DEN NESTE
Chairman of the Board

Véronique GRAFF
Managing Director

The **GreenWin** innovation cluster is motivated in each of its actions by the values of **Creativity, Responsibility, Freedom, Engagement & Daring**.

KEY NUMBERS

INTERNATIONAL INFLUENCE COMPANIES / ACADEMICS:
CVBB Conferences 300/an
Creation of CO_2 Value Europe

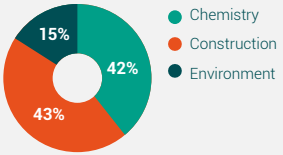
800 CONTACTS WORLDWIDE

AVERAGE/YEAR
6 certified projects /year
€16M budget for projects

PORTFOLIO OF 42 PROJECTS = + €110M

195 MEMBERS:
29 LES, 114 SMES,
16 CRA-W, 5 UNIVERSITIES...

2018 :
10 new members ⊂75% companies members ⊂ 73% companies≡ 15.000 fte = +20% fte in 10 years (+40% fte for SMEs)



5 EUROPEAN PROJECTS
(2 OF WHICH COORDINATORS)

SCOT: CO_2 utilisation for companies with heavy CO_2 emissions and innovative SMEs

CO_2 VALUE EUROPE: creation of industrial AISBL

LCIP: LCA for SMEs

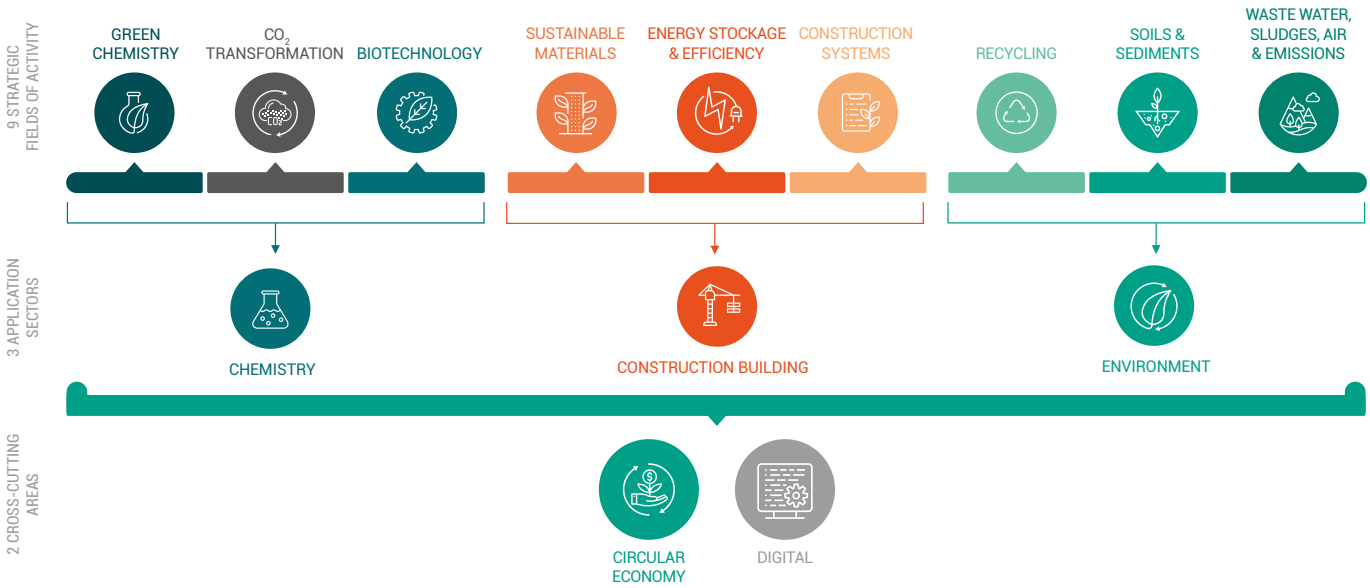
AGRICHEMWHEY: industrial pilot. LE + SME in bio-sourced economy

FERTIMANURE: project for the valorisation and transformation of animal excreta into natural fertilisers

SPHERES OF STRATEGIC ACTIVITIES

GreenWin :
9 SPHERES OF STRATEGIC ACTIVITIES WITHIN 3 SPECIFIC SECTORS

GreenWin is committed to acting in nine spheres of strategic activities within three specific sectors.
The circular economy and digital transition lie at the heart of the cluster's strategy.



SOCIETAL AND ENVIRONMENTAL CHALLENGES:

GREENWIN SOLUTIONS

The challenges facing the spheres in which we are active are in fact transversal, but **our areas of activity lie at the very heart of the solutions that need to be developed** and applied so that these challenges can be tackled from a wider societal perspective.

THE **CHEMISTRY** SECTOR FACES A TRIPLE CHALLENGE:

- challenges linked to climate change;
- insecurity of access to resources;
- access to energy.

Limits to resource access and climate-linked changes will provoke geopolitical tensions and pressures that nobody will be able to escape.

Our planet, by its very nature, is circular and finite, so that the ever-increasing scarcity of resources can only inevitably cause problems. **Consequently, the green chemistry sector will become key to reducing these pressures and moving towards a decarbonised, circular economy.**

CONSTRUCTION FOR ITS PART FACES A DOUBLE CHALLENGE:

- in the very short term, **the surge in digital technology** required throughout the whole production chain and its impact on the creation of new jobs - the outlines of which we can't yet even imagine – but also on existing jobs in the sector with the risk of crisis that this entails;
- the **re-evaluation of business models and flexibility**, that, now more than ever, will become key factors in the industrial prosperity of our sectors and that of Wallonia.

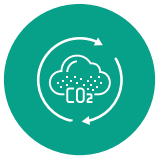
IN THE **ENVIRONMENTAL** SECTOR,

management and environment remediation techniques allow **for the rehabilitation of soils and the cleaning up of water, air and sludge**. Moreover, waste management must be taken into account at industrial as much as at consumer level.

To this end, «**cradle-to-cradle**» is becoming more and more of a solution, however this requires evolution across a whole section of the recycling sector which must become a «zero waste» partner, rather than an adversary, by accepting to re-evaluate the method and nature of its functioning by adopting the universal principle of Lavoisier, which today still retains all of its potency: *nothing is lost, nothing is created, everything is transformed ...*

DESTINATION ZEN

(Net Zero CO_2 Emissions):



CARBON NEUTRALITY ACROSS WALLONIA AND BY WALLONIA

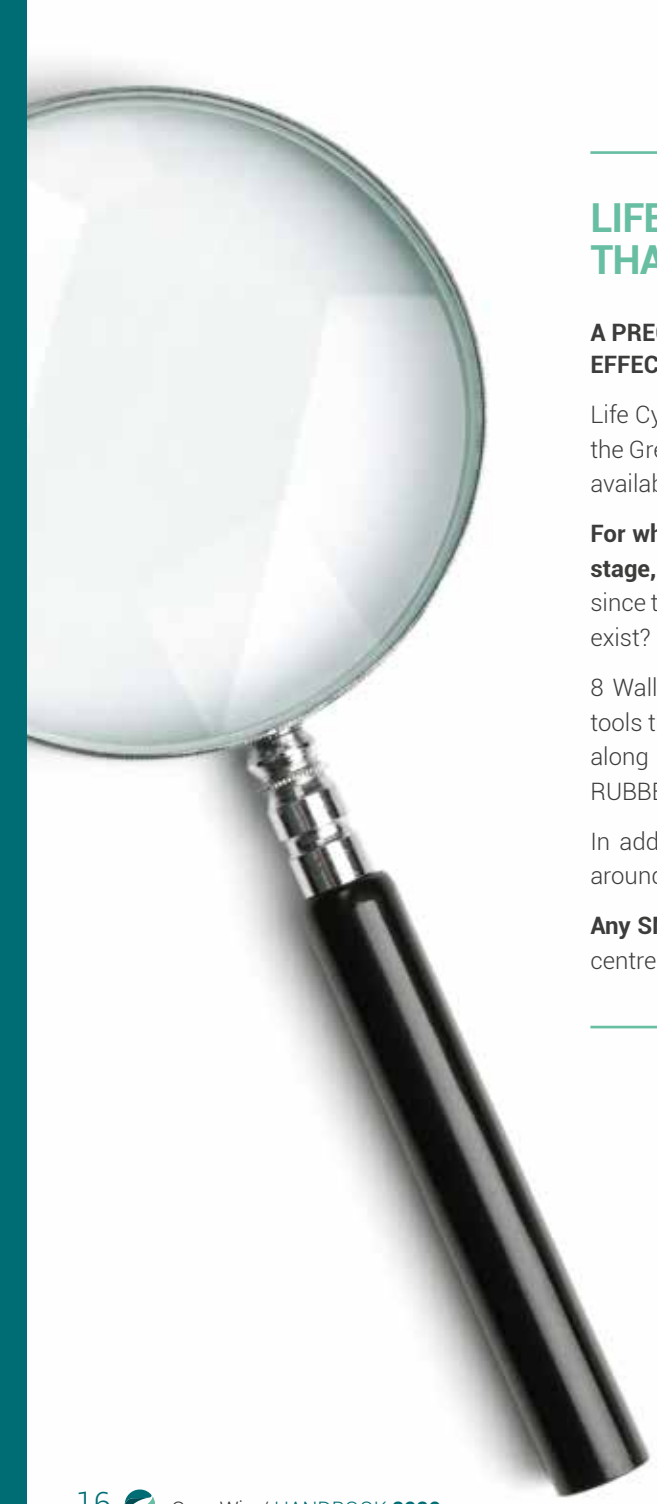
GreenWin has given itself the objective of actively contributing to Wallonia reaching a state of balance between man-made greenhouse gas emissions and their extraction from the atmosphere, by or as a result of human-made action, in the three sectors that are relevant to the cluster's activities. This necessitates the implementation of methods that encourage or strengthen the absorption capacity of natural carbon sinks (forests, soils and oceans) and, to this end, the creation of useful Negative **Emissions Technologies** (NET technologies).

Following closely in the footsteps of the European SCOT project, The 1st European initiative for the capture and usage of CO_2, which **GreenWin** coordinated (and which gave rise to the notion of carbon neutrality and/or carbon circularity), the cluster was given the mandate to put into place a permanent European structure supported by industry - **CO_2 Value Europe** - which, in an unprecedented and exclusive manner, **represents and gathers all those involved in the usage of CO_2 in Europe, therefore significantly contributing to putting a low carbon economy in place in the EU**.

The initiative has benefited from a sustainable public-private partnership between industrialists and the EU in the chemistry sector. In fact SPIRE, a public-private partnership between industries and the European Commission has integrated the teachings of SCOT into its strategy and areas of priority. This is also the case for the JU (Joint Undertaking) BBI.

GreenWin also constitutes a partner of choice when it comes to helping companies manage their vulnerability to climate change.

Several **GreenWin** projects are dedicated to, or contribute towards, this societal objective. Some of the most striking examples can be found in the profile pages of this handbook. Each has been labelled with a distinctive pictogram to facilitate its identification.



LIFE CYCLE ANALYSIS THAT IS ACCESSIBLE TO ALL

A PRECAUTIONARY MEASURE AGAINST THE UNDESIRABLE EFFECTS OF INNOVATION.

Life Cycle Analysis or LCiP (Life Cycle in Practice) is a European project of which the GreenWin cluster was a partner. Its aim was to make Life Cycle Analysis (LCA) available to SMEs.

For what is the point of innovating in the search for new solutions if, at a later stage, these are going to reveal disastrous side effects that were foreseeable, since the time and useful resources to spot, identify and preventively resolve them exist?

8 Walloon SMEs took the gamble and as pioneers benefited from customised tools that enabled them to take strategic decisions to adapt their business model along LCA principles. Companies such as PREFER, MOBIC, PCIM, ISOHEMP, RUBBERGREEN, PUR VER, BIOWASTE RECYCLING and PAN-TERRE.

In addition, the cluster has also put into place a resource centre that revolves around three of our members: CSTC, MATERIA NOVA, and ULiège-PEPS.

Any SME that might be interested can contact the cluster in order to access the centre's services.

THE CIRCULAR ECONOMY

AN ANSWER TO THE LIMITS AND FINITUDE OF RESOURCES

The circular economy goes hand in hand with the cluster's other specificities, namely:

- the seeking of carbon neutrality;
- life cycle analysis;
- climate change risk assessment.

The recycling of waste is one of the fundamental elements of a circular economy, but it is not the only one. **GreenWin** is designed to focus on the promotion and implementation of circular models of production and business.

The circular economy is a principle of integration that gathers a number of different approaches which, linked together and working interactively, seek a **common objective: the optimisation of resource usage as a lever for the competitiveness of enterprises.** Within this approach, the concepts of **eco-design and circular production**, of **reverse logistics**, of **industrial symbiosis and new business models** all work in an integrated manner to allow industry to move towards a circular economy.

The WaloSCRAP and WaloSCRAPII projects are two embodiments of this: the WaloSCRAP I &II grant, successfully applied with SPW Agriculture – Ressources naturelles – Environnement (the public body that manages Wallonia's rural and natural heritage) focused on the setting up of viable industrial lines originating in Wallonia. **It was found that for a recycling stream to be viable, it was also vital to respond in parallel, and in a coordinated manner, to challenges that are not necessarily of a technological order**.

The different activities achieved within the framework of the WaloSCRAP I & II projects therefore allowed us to obtain a global image of the sector for each of the waste deposits that were studied.

It will be possible to speak of real circular economy only once we evolve inside an economy where **waste** is truly and systematically perceived, valorised and treated as an **actual resource**.

PEPIT

The PEPIT, technological platform for the transition of the plastics industry towards a circular production model

is a consequence of the above. It is a collaborative technological platform for Walloon R&D operators at the service of business innovation meant to encourage the development of a circular economy for the plastics industry.

Through the development of the PEPIT platform, the GreenWin cluster played a mobilising role in its regional ecosystem around the plastics issue. This need had been identified after an assessment undertaken in the context of the cluster's activities within WALOSCRAP II.

The cluster therefore decided to develop a collaborative technological platform based on the competence of the certified Walloon research centres (Centres de Recherche Agréés wallons (CRA)), who supported the innovation. In July 2018 the initiative was strengthened through collaboration with the MecaTech and Plastiwin clusters, with the aim of adding expertise to the platform in the areas of prospecting, upgrading and access to markets, and with a view to developing a portfolio of projects.

To date, the following CRAs have joined the initiative:
CELABOR, CENAERO, CENTEXBEL, CERTECH, CTP, MATERIA NOVA and SIRRIS.

PEPIT aims to provide companies with a complete innovation support service in order to achieve the integration of the plastics industry into the circular economy. Companies will then be able to benefit from an integrated service (strategic monitoring, project structuring, process diagnostics) and be supported by experts, enabling them to develop competitive advantages and rapidly position themselves in up-and-coming markets.

THE BIOBASED ECONOMY

ADDRESSING PROBLEMS OF ACCESS TO RESOURCES AND BOOSTING THE IMPLEMENTATION OF REAL CIRCULARITY

The biobased economy permits to disengage from excessive dependency on fossil- based resources, which are limited and non-renewable, while reducing the environmental impact by the companies that use them and diversifying sources of energy and income derived from biomass.

It is one of the **keys towards the successful transition to a real circular economy**.

TOWARDS
A BIOBASED ECONOMY
IN WALLONIA

COQ VERT is a GreenWin initiative for the development of a biobased economy in Wallonia initially comprised of AWEX, essenscia-Wallonie and ValBiom.

COQ VERT is a public-private partnership between the **GreenWin** cluster, AWEX-Foreign Investments and **ValBiom**, joined by **essenscia-Wallonie**, l'Office Economique Wallon du Bois (Walloon economic office for wood), the **Wagralim** cluster and the Walloon administration (DG06).

Through this project, the partners intend to significantly contribute to the **development of a strong and competitive biobased economy in Wallonia by generating new research and investment projects essential** to the development of the bio-sourced chemistry sector, and in particular **chemistry that is plant based**.

In 2018, the COQ VERT consortium produced a **memorandum** that contained the **recommendations** for the development of a bio-sourced economy in Wallonia.

This was presented on 18 April 2018 on the occasion of a working group that gathered industrialists from the sector. **The aim was to collect contributions by those industrialists as well as garner their support.**

Following on from this working group, the industrialists made a commitment to support the memorandum written by the COQ VERT consortium.

At the end of 2018, the Walloon Region decided to write a strategy for the development of a biobased economy in Wallonia that highlighted ways of developing bio-sourced products and materials, as well as services and technologies, for the short, medium and long terms. The results will be available at the end of 2019.

Since 2014,
the GreenWin cluster,
in collaboration with ValBiom,
has been an effective member of
the European Biobased Industries
Consortium - BIC

which gathers the European bio-sourced industry. BIC (with around 200 members) represents the private part of BioBased Industries Joint-Undertaking, a public-private partnership established with the European Commission. This alliance opens the doors for Walloon SMEs from sectors of relevance to the cluster to the European programmes in the bio-sourced economy, access to which would otherwise be a lot more complicated.

BLUE, WHITE, GREEN: BIOTECHNOLOGIES OF THE GREENWIN CLUSTER

Wallonia's expertise in biotechnology goes back to the Middle-Ages and to its brewing tradition: what better example to illustrate the part enzymes, yeast and micro-organisms play in the transformation of substances and ingredients into a completely new product?

With **white biotechnologies**, **nature is put at the service of industrial processes, in an approach that is respectful of the environment and uses little energy.** The ambition is the sustainable production of biochemical substances, biomaterials and biofuels on an industrial scale, and from renewable resources.

With the help of biotechnologies, researchers at GreenWin are actively seeking to produce energy and biomaterials while preserving the environment.

THE REHABILITATION AND REMEDIATION OF THE ENVIRONMENT

ADDRESSING THE URGENT NEED TO DECONTAMINATE SOILS, SEDIMENTS, SLUDGE, WATER AND AIR

Environmental technologies constitute **a weapon in the rehabilitation and remediation of the environment**. Wallonia has developed real expertise in this field, with the taking charge, management and reassignment of old industrial sites left unused after the demise of heavy industries that impacted strongly on the environment. Aware of its environmental duties, and of the **economic opportunities**, Wallonia has risen to the top of those regions that possess know-how in this area as a result of a regional impulse, at the beginning of the new millennium, aimed at the rehabilitation of soils, air, and waters (watercourses and groundwater). Consideration for the strategic issues linked to these natural resources in the short, medium, and long term, on a global level, is what incites GreenWin to continue supporting innovation projects in this field, projects which, consequently, are also meant to be exported to outside markets.

Companies, university laboratories and colleges, research centres are among many operators capable of sharing their expertise and resources leading to the successful implementation of concrete projects, in situ, in partnership with companies and organisations dedicated to these issues.

DIGITAL TRANSITION

NOT SO MUCH OF A THREAT, BUT OPPORTUNITIES TO BE SEIZED AND DEVELOPED

Digital transition, or Industry 4.0 and **Construction 4.0**, needs to be considered along two principal angles: *the technological approach, but also the evolution of jobs, practices, mind sets and business culture*. It resembles the circular economy quite closely: *flexibility, transparency, efficiency of production streams and costs, traceability within the production process and traceability of suppliers, extended enterprises…* It can, therefore, come into conflict with the conventional concept of the business model.

To progress towards a successful digital transition, one now needs to accept the **need to question old models**, and open up to the possibility of changes in company culture and in the business model.

It is hardly surprising therefore that the functional economy, along with the circular economy, is supported in its implementation by the digital technology and its many applications.

Within this context, **GreenWin** offers **support and consultation** to its members in respect of their innovation projects. The cluster is also in contact with organisers and suppliers of training courses in order to better prepare this digital transition at human resource level and in respect of the creation of new employments and skills.

GreenWin, partner of the **Made Different** programme, initiated by AGORIA and SIRRIS, with the support of DIGITAL WALLONIA

Made Different Digital Wallonia is an awareness and support programme that assists industrial enterprises in Wallonia with their transition towards Industry 4.0. It is backed by 15 companies from the Walloon economy.

It has been designed with every industrial sector in mind and supports innovation aimed at the manufacturing process, the goal being to secure industrial production in Wallonia by making our enterprises more competitive.

7 technological transformations and one business model transformation have been identified as essential elements in transforming our enterprises into true «**Factories of the Future**»:

- World Class Manufacturing Technologies
- End-to-end engineering
- Digital Factory
- Human Centered Production
- Production Network
- Eco Production
- Smart Production Systems
- Smart Business Model

The raising of awareness, diagnostics, support and guidance, transformation, evaluation, recognition and endorsement by the network are pillars of the Made Different approach.

Its deployment across Wallonia is carried out with the help of ambassador companies and bodies, beacons of reference for the entire regional industrial network.

Several GreenWin members — including THE ATELIERS DE L'AVENIR, MOBIC and PRAYON — feature among those ranking as the most performing, innovative and inspiring in terms of digital transition, **having won the prestigious Factory of the Future Award**.

GreenWin cluster members feature among **the top performing companies in Wallonia and in Belgium**:

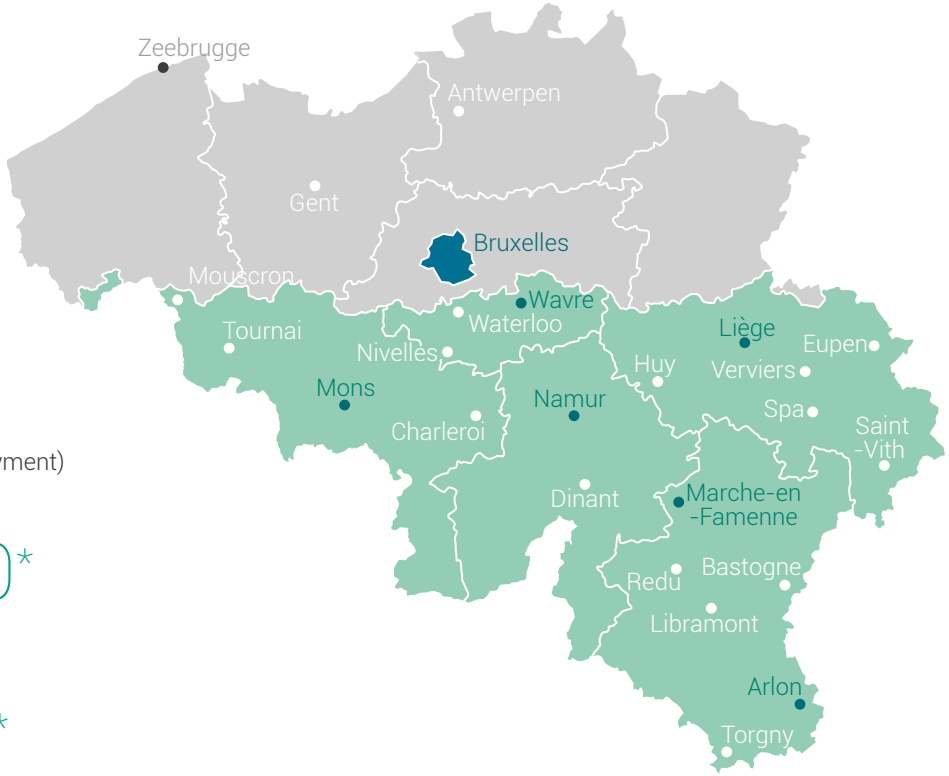
+20%
EMPLOYMENT GROWTH RATE

+40%
ADDED VALUE GROWTH RATE

85 000*
DIRECT JOBS
(26% of industrial employment)

160 000*
INDIRECT JOBS

€15 BN*
IN EXPORTS
(36% of Walloon exports)



*figures from the industrial sectors in which GreenWin is active: Chemistry, Construction and Environment

GREENWIN IN NUMBERS

...

GreenWin's membership is made up of a number of enterprises (small, medium and large) as well as 5 universities, with their institutes and research labs, several university colleges, certified research centres, continuing education suppliers, and sectorial and professional federations.

It constitutes a network and a source of collaboration that is as rich as it is varied.

GreenWin also benefits from 4 international partnerships with counterpart innovation clusters in France, Italy, Quebec and Flanders. It also enjoys membership of 5 large international networks.

200+
NUMBER OF MEMBERS OF WHICH

150+
CORPORATES

4
INTERNATIONAL PARTNERSHIPS

5
INTERNATIONAL NETWORKS GREENWIN IS PART OF

MEMBERSHIP

GREENWIN OFFERS 3 DIFFERENT TYPES OF MEMBERSHIP : ASSOCIATE, REGULAR AND PREMIUM

with membership fees that are very quickly offset by the numerous advantages that membership of the cluster brings.
Details of the different levels of membership and related fees can be found on the dedicated page of our website : *https://www.greenwin.be/page/cotisations.*

KEY ACTIVITIES

OUR SERVICES

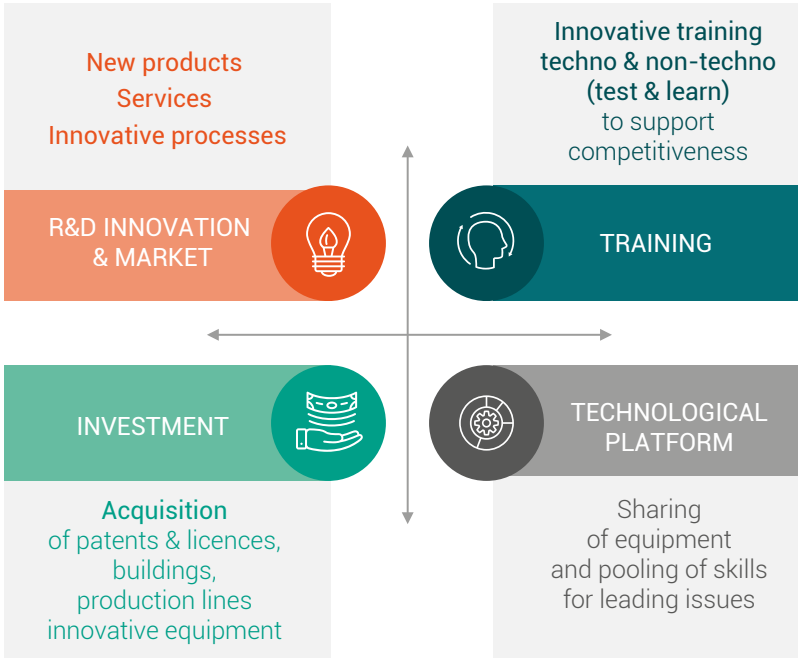
GreenWin offers a whole range of support services, including the reinforcement of skills and the valorisation of products and services in Belgium and at international level, in addition to the activities that are carried out by AWEX and its network of economic counsellors across the world. The cluster also cooperates with WBI, in the framework of interuniversity, educational and academic collaborations.

These services are centred around and dictated by the needs of the members.

The cluster's raison d'être is
the successful implementation of collaborative innovation projects.

CLUSTER PROJETS

CHARACTERISTICS OF CLUSTER PROJECTS:



These different types of projets can coexist within the same cluster project.

A CLUSTER PROJECT IS AN AMBITIOUS PROJECT THAT MUST PRINCIPALLY FULFIL 4 CRITERIA:

- **Collaborative:** there has to be effective collaboration between the partners.
- **Innovative:** the new product/ procedure/service must be innovative compared to the current state of technology.
- **Sizeable market:** the target market must be large enough to generate returns for the region, the consortium must be able to access that market.
- **International:** the project must aim to be exportable internationally in the medium term.

Objectives	Establishing of a new procedure /product /innovative service to which value can be added on the market
Consortium Min. 2+2	Univ/Colleges/CRA + Univ/Colleges/CRA + SME + SME/LE
Sizeable budget	Between €800,000.00 and €1,000,000.00 per project
Duration of project	Between 2 and 4 years
Financial support	Between 40% and 100% in subsidies.
Type of eligible research	**Research**: laboratory, generation of new knowledge **Development**: on site, application of existing knowledge. Up to pilot scale!
Time2market	Medium term: 3 to 5 years

TRL = Technology Readinesss Level = maturity of project

SUCCES RATES

AS A RESULT OF ITS SUPPORT ROLE THE CLUSTER HAS ACHIEVED THE FOLLOWING SUCCESS RATES:

70%

CERTIFICATION RATE OF PROJECTS PRESENTED BY GREENWIN

compared to 12% at European level and between 20 to 50% for a standard Walloon project...

42

NUMBER OF PROJECTS CERTIFIED FROM THE CREATION OF THE CLUSTER IN 2011 TO 2018.

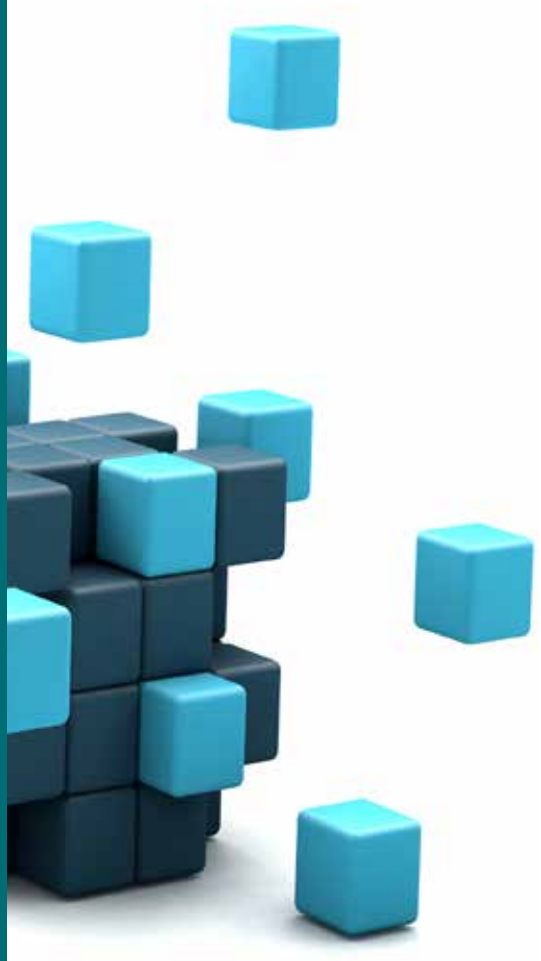
4

TECHNOLOGICAL PLATFORMS SET UP SINCE THE CREATION OF GREENWIN.

AT THE HEART OF THE WALLOON ECOSYSTEM AND ON THE INTERNATIONAL SCENE:

GREENWIN STRATEGIC PARTNERS

STRATEGIC PARTNERS THAT OPERATE ON MANY LEVELS, SECTORIAL AND GEOGRAPHIC



IN BELGIUM :

GreenWin belongs to a community of six Walloon innovation clusters along with BioWin (life sciences and red biotechnology), Logistics in Wallonia (logistics and freight transport), MecaTech (mechanical engineering and metallurgy), Skywin (aeronautical sector) and Wagralim (food sector).

GreenWin's focus on three sectors of activity means that it collaborates regularly with **the following business clusters**: CAP Construction, Eco-Construction, Infopôle, Plastiwin, and TWEED.

Professional federations are its preferred interlocutors and partners: Agoria, essenscia, the Walloon Construction Confederation - CCW, FEBELCEM, FEDUSTRIA, FEGE, GO4CIRCLE and INDUFED, in particular.

VALBIOM is a Walloon benchmarking body and our strategic partner for everything that concerns **the upgrading of biomass**.

In order to facilitate partnerships between the North and the South of Belgium, **GreenWin** signed a Memorandum of Understanding (MoU) with is Flemish counterpart Catalisti. From 28 September 2018 it became possible, and easier, **to set up interregional collaborative innovation projects whilst at the same time respecting the specifics and modalities of each region in the co-financing procedure**.

As the cluster is in an advantageous position when it comes **to identifying new production methods and new professions that result from innovations**, **GreenWin** is naturally a privileged partner for Walloon training and skills centres and operators such as FOREM, IFAPME, Technifutur, Jobs@Skills, the Faculty of UCLouvain School of Management, the EPHEC, HELMO and others.

Finally, **the valorisation of the cluster's projects and of its Members on external markets** is made possible thanks to the support of the relevant official promotional organisations in Wallonia and in the Fédération Wallonie-Bruxelles, namely and respectively AWEX and WBI.

IN EUROPE:

Again in 2018 the cluster would play an important role in several networks that are actively involved in the themes as defined by the operational cell; **GreenWin**'s presence within them helping to support the regional strategic vision in the medium and long term, notably in the sectors of the bio-sourced economy.

Within this framework, let us also mention the follow-up and daily activities that are undertaken by the cluster within Walloon networks (COQ VERT), Belgian networks (GRD Network – Group for Research & Development), and European networks such as **VANGUARD, CO_2 VALUE EUROPE, SUSCHEM** and **BIC**.

Accordingly, **it is essentially with the COQ VERT** (see below) and **BIC** (Biobased Industries Consortium) **networks that the cluster has chosen to be the most active**.

In this context, a large number of the meetings of the COQ VERT Walloon consortium were organised by the cluster, in fruitful collaboration with the consortium's other operators.

At European level, in collaboration with VALBIOM and the NCP WALLONIA, **GreenWin** has been the cluster most present within the BIC consortium. Within the framework of this network, **it represents around 10 Walloon enterprises. Activities undertaken by the cluster within the network are of course carried out in close connexion with initiatives taken at regional level** and with the «COQ VERT» consortium.

Finally, 2018 also presented the cluster with the opportunity to continue, through an industrial member of its Executive Office (CARMEUSE), to work on the Association européenne du CO_2 (European CO_2 Association) that was launched at the end of 2017. The list of the association's current members can be found at http://www.co2value.eu/about-us/members/

GreenWin's dynamism on external markets and within European initiatives has facilitated networking possibilities with competitiveness clusters from other European countries. In this context, the cluster has signed MoUs with its French and Italian counterparts, AXELERA and SPRING ITALY. Other clusters from The Netherlands, Switzerland, The Grand Duchy of Luxembourg, and Germany are regular interlocutors.

AT INTERNATIONAL LEVEL :

GreenWin's connections however spread well beyond EU borders.

Our business relations in Quebec afford us the opportunity to collaborate regularly with our local equivalent, CRIBIQ.

Other partnerships on the different international markets that **GreenWin** considers a priority, such as Brazil, India, or Russia for example, can also be envisaged.

GREENWIN AND WALLONIA'S SMART SPECIALISATION STRATEGY

Within the framework of its 2014-2020 European funding programme, the European Union requested that all European regions elaborate a **smart specialisation strategy**, known as **S3, to develop research and innovation** on their territories.

Wallonia's S3 was elaborated and approved in 2015 with harmonisation and collaboration between all parties involved in the different regional industrial, research and innovation policies firmly in mind.

Wallonia has placed innovation clusters at the very heart of its S3 which rests on the principle that each region must concentrate its resources on the innovation areas in which it has a competitive advantage compared to other European regions.

GreenWin jointly presides over two of Wallonia's S3 working groups (WG) **– The Bioeconomy, Agrifood & Natural Resources WG, and the Climate, Energy & Mobility WG – and also coordinates the «circular economy» segment of the Digital & Industry WG.**

GREENWIN PROJECTS


SUCCESS STORIES

ATISOL C2C

SUCCESS STORY

CONSTRUCTION SECTOR

ENERGY EFFICIENCY & QUALITY OF HOME ENVIRONMENT

WELL-BEING IN HOME ENVIRONMENT

ATISOL C2C

HOW CAN YOU INSULATE AND VENTILATE A BUILDING, BETTER AND ECOLOGICALLY?

GreenWin presents ATISOL C2C:

ATISOL C2C proposes an air and vapour barrier membrane that is produced from plant material combined with cork and wood fibre. It can be used in the renovation of existing constructions or in the construction of new timber-framed buildings.

The process conceived includes an insulation material, a vapour barrier and a coating, providing a solution that is totally ecological over the entirety of its life cycle. This allows for a reduction in energy loss, slows the passage of damp into the construction, and prevents problems with condensation within the insulation itself.

THE « PLUSSES »:

- More reliable life expectancy.
- Faster application.
- Ease of dismantling and possibility to reuse.

Partners:

Industrial: DERBIGUM (project manager) and SIOEN.

Scientific: CSTC, CENTEXBEL and ULiège PEP's.

The CIMEDE project aims to develop a new construction concept based on industrially prefabricated wood panels.
The system was developed in two phases:

- *the first destined for family homes (CIMEDE 1);*
- *the second for the wider community (CIMEDE2).*

CIMEDE is a concept based on a social and circular economic model.

HOW DOES ONE BUILD FLEXIBLE, SUSTAINABLE AND ECONOMICAL TIMBER FRAME HOMES?

GreenWin presents CIMEDE1:

CIMEDE is a new patented timber frame construction system using industrially prefabricated timber that allows for the construction of flexible low-energy buildings.

THE « PLUSSES »:

- Speed of construction.
- Limited and non-intrusive intervention on building sites.
- Reduction in CO_2 emissions as a result of the low levels of energy required for the transformation of wood.
- Flexible interior construction (easy displacement of internal panels with no impact on interior finishes).
- Possibility of expanding (or reducing) the building in order to adapt to the real needs of the occupants.
- Ease of adaptation over time (modification of interior and exterior finishes / shifting, additions or removal of window openings).

SUCCESS STORY

CONSTRUCTION SECTOR

ENERGY EFFICIENCY, QUALITY OF HOME ENVIRONMENT & MODULAR CONSTRUCTION

CIRCULAR ECONOMY

Partners:

Industrial: THE ATELIER DE L'AVENIR (project coordinator), ATELIER D'ARCHITECTURE ERIC GRONDAL, KNAUF, MERY-BOIS and WUST.
Scientific: ULG and CSTC.

HOW CAN ONE BUILD TIMBER FRAME CARE CENTRES FOR THE DISABLED, OR RETIREMENT HOMES, NURSERIES AND SCHOOLS?

GreenWin presents CIMEDE2:

One of the aims of this project is to allow potential new buyers, notably young couples, to achieve ownership of homes that can progressively adapt to their needs at competitive prices, while still maintaining optimum levels of quality, finish and comfort.

Technically, the CIMEDE construction system is composed of different elements that allow for a building to be conceived as flexibly as possible.

THE « PLUSSES »:

- Flexible nature of the building (easy displacement of internal panels with no impact on interior finish).
- Possibility to expand (or reduce) the building in order to adapt to the real needs of the occupants.
- Ease of adaptation over time (modification of interior and exterior finishes / relocation, adding or removing of window openings).

Partners:

Industrial: THE ATELIER DE L'AVENIR (project coordinator), KNAUF, MATRICIEL, MERY-BOIS and OPEN ENGINEERING.

Scientific: CENAERO, CSTC, UNIVERSITÉ CATHOLIQUE DE LOUVAIN and ULG.

ECO-BLENDS

SUCCESS STORY

CONSTRUCTION & ENVIRONMENTAL SECTORS

ENERGY EFFICIENCY & RENEWABLE ENERGY

POLLUTION PREVENTION

ECO-BLENDS

HOW CAN YOU OPTIMISE THE EFFICIENCY OF OFF-SHORE WIND TURBINES AND OF GEOTHERMAL ENERGY?

GreenWin presents the ECO-BLENDS investment project:

EUROQUARTZ has developed a new industrial installation with products that originate from EUROQUARTZ R&D. This new installation is able to supply ready-made mixes that fulfil required mechanical performance specifications once injected into the foundations of off-shore wind turbines. EUROQUARTZ also has the logistical capacity to supply these products in bulk on the open sea.

With regards to geothermal energy, the company has developed a product that offers excellent thermal conductivity (helping to improve the efficiency of the geothermal installation) as well as very low permeability (helping to protect groundwater by avoiding any form of contamination).

THE « PLUSSES »:

- Supply of bulk mixes with high mechanical performance on the open sea.
- Excellent thermal conductivity and low permeability.

Partners:

Industrial: EUROQUARTZ (project coordinator).

Scientific: CENTRE DE RECHERCHE TERRE & PIERRE.

ECOCITYTOOLS

SUCCESS STORY

ENVIRONMENT
SECTOR

ENERGY EFFICIENCY, QUALITY OF HOME ENVIRONMENT & QUALITY OF THE ENVIRONMENT

NUMERICAL
& DIGITAL

ECOCITYTOOLS

HOW CAN YOU SIGNIFICANTLY IMPROVE THE ENVIRONMENTAL MANAGEMENT OF OUR CITIES?

GreenWin presents ECOCITYTOOLS:

The ECOCITYTOOLS project aims to commercialise products and services that can help with decision-making in the design and sustainable management of cities and neighbourhoods.

The tools will enable the modelling and measuring of outdoor thermal comfort (notably micro-climates) and of air quality, taking local events into account (sources of pollution or heat) as much as global ones (the upper atmospheric layer or temperature inversion). They also integrate the energy issue by providing for the establishment of an energy register at neighbourhood scale.

THE « PLUSSES »:
The main advantages of this system are related to the quality of the environmental and energy-related diagnostics at neighbourhood level at affordable costs. These allow for the making of decisions in respect of rehabilitation or development choices on the basis of data that is of relevance.

Partners:

Industrial: 1SPATIAL (project coordinator), ARCADIS, ATM-PRO, ODOMETRIC and METERBUY.

Scientific: CENAERO, ULIÈGE (Geomatics Unit, Energy & Sustainable Development Unit and Sensing of Atmospheres and Monitoring Unit of the University of Liège) and GRELIÈGE (Group for the economic redeployment of the Province of Liège).

FRENSIS

SUCCESS STORY

CONSTRUCTION
& ENVIRONMENT
SECTORS

NEW CONSTRUCTION PROCESSES,
ENERGY EFFICIENCY &
REDUCTION IN CO_2 EMISSIONS

POLLUTION
PREVENTION

FRENSIS

HOW CAN WE REDUCE OUR GREENHOUSE GAS EMISSIONS BY 10% WITH THE HELP OF OUR WINDOWS ?

GreenWin presents FRENSIS:

FRENSIS aims to develop super-insulating glazing and equally super- insulating window frames.

Based on vacuum glazing technology, the manufacturing process produces ultra-thin glass presenting an unequalled thermal insulation coefficient. The project is actually at industrial production phase.

The development also consists in integrating vacuum glazing in the most optimum way to minimise thermal bridging.

THE « PLUSSES »:

- Contributes towards the achievement of targets in respect of the reduction in greenhouse gas emissions.
- Radically modifies the actual tendency of increasing the width of elements in order to improve their insulating capacity.
- Allows for highly streamlined designs.

Partners:

Industrial: AGC GLASS EUROPE (project coordinator), PIERRET SYSTEM and MOORES EQUIPEMENT.

Scientific: MATERIA NOVA, UMONS and UCL.

MEDIX

SUCCESS STORY

ENVIRONMENT & GREEN CHEMISTRY SECTORS

POLLUTION TREATMENT (DECONTAMINATION) **OF WATER** & **ENVIRONMENTAL REHABILITATION**

CIRCULAR ECONOMY

MEDIX

HOW CAN ONE TREAT PHARMACEUTICAL MICROPOLLUTANTS FOUND IN WASTEWATER THAT ARE GENERATED, NOTABLY, BY HEALTHCARE ESTABLISHMENTS?

GreenWin presents MEDIX:

MEDIX was developed in order to address the treatment of micropollutants of pharmaceutical origin in our wastewater, micropollutants that have a recognised negative impact on the ecosystems, fauna and flora that are subjected to them, as well as on mankind. Through a novel process that is flexible, modular and energy-efficient and entirely based on the biological degradation of micropollutants, MEDIX is able to arrest pollution at source.

Having taken the gamble to anticipate legislation, MEDIX offers an ideal solution for addressing this public health linked problem.

THE « PLUSSES »:

- In comparison with processes for the treatment of micropollutants that are already known and mastered, MEDIX doesn't generate highly toxic supplementary by-products.
- In addition MEDIX consumes less energy and offers higher yields. Its achievements have been validated by an independent laboratory.
- MEDIX offers simple and modular integration.
- MEDIX benefits from the know-how of the John Cockerill Balteau company.

Partners:

Industrial: JOHN COCKERILL BALTEAU (project coordinator), SYMBIO CONCEPTS and PRODUCTS SPRL.

Scientific: CEBEDEAU, CART (Center for Analytical Research and Technology) and LIST (Luxembourg Institute of Science and Technology).

MINERVE

SUCCESS STORY

ENVIRONMENT SECTOR

WASTE MANAGEMENT AND VALORISATION & **SITE DECONTAMINATION**

CIRCULAR ECONOMY

MINERVE

HOW CAN ONE BETTER EXPLOIT AND VALORISE HOUSEHOLD WASTE LANDFILL SITES?

GreenWin presents MINERVE:

The MINERVE project proposes an integrated solution for the long-term management of landfill sites and non-controlled dumps through a methodology centred around 3 interconnected stages:

- Categorisation of landfill sites.
- Optimisation of waste mineralisation process.
- Extraction and treatment of mineralised waste.

THE « PLUSSES »:

- Shortening of the life cycle of buried waste.
- Maximising the material and energy valorisation of buried waste.
- Betterment of the scientific expertise required for the 3 stages of the proposed methodology.

Partners:

Industrial: RENEWI (project coordinator), ARTECHNO and HOLCIM.

Scientific: UCL, ULIÈGE (University of Liège), CENTRE WALLON DE BIOLOGIE INDUSTRIELLE, ULIÈGE-GXAB (Agro-Bio Tech Unit, University of Liège) and CTP (International technological centre for soil and stone).

NISHYCEM

SUCCESS STORY

CONSTRUCTION SECTOR

ENERGY EFFICIENCY & INNOVATION IN SUSTAINABLE MATERIALS

WELLBEING IN HOME ENVIRONMENT

NISHYCEM

HOW CAN YOU IMPROVE THE SUSTAINABILITY OF CEMENT MATERIALS, CONCRETE, FOAM CONCRETE OR FIBRE CEMENT SHEETING?

GreenWin presents NISHYCEM:

Cement materials are porous in nature, a disadvantage which is noticeable at two levels: the mechanical resistance of concrete, and the durability of concrete. Reducing the absorption of water through the porosity of the cement matrix constitutes the best defence mechanism against aggressive agents.

NYSHYCEM has developed an ideal integral water repellent for use in cement materials that is based on micro-encapsulation technology. The advantage of this water repellent is that it has no impact on the mechanical properties of materials as it renders the cement matrix hydrophobic in its mass without changing its natural properties (notably its breathability).

THE « PLUSSES »:

- High value-added product that enables the manufacturing of more sustainable materials with a longer workable life.
- The use of integral water repellents allows for treatment to be carried out at the same time as the material is being prepared, cutting out the need for one of the stages of the procedure.
- It offers complete protection, even in the case of incision or the drilling of holes.
- The new additive has minimal impact on the mechanical properties of cement materials, allowing for its use in materials such as foam concretes.

Partners:

Industrial: DOW CORNING/DOW (project coordinator), PREFER and TECNICHEM.

Scientific: CRIC, ULB, LABORATOIRES BATIR and 4MAT.

RECYPLUS

SUCCESS STORY

ENVIRONMENT SECTOR

RECYCLING OF WASTE, POLLUTION PREVENTION & **REDUCTION IN CO_2 & IN DEPENDENCE ON OIL**

POLLUTION PREVENTION

RECYPLUS

HOW CAN YOU ALSO RECYCLE, IN ADDITION TO TRADITIONAL PMCS, THE RESIDUAL FRACTION OF PLASTICS I.E. THE P+MC (rigid plastics such as trays, tubs and pots, as well as flexible plastics such as films and bags)**?**

GreenWin presents RECYPLUS:

This project aims to seek out the household plastic waste in our rubbish bags that ends up being incinerated, with a view to searching for ways of recycling it. The three-and-a-half- year research programme started off with the classification of household waste streams from several Walloon intercommunalities. It then focussed on mechanical plastic sorting tests undertaken with experimental machines. Once these plastics were collected and extracted, the project applied itself to finding recycling processes for them so that tomorrow our yogurt pots, tubs and plastic films can also get to enjoy a second life!

THE « PLUSSES »:

- Creation of new raw materials and reduction, therefore, in CO_2 emissions.
- Reduction in the dependency on virgin raw materials.

Partners:

Industrial: SUEZ R&R BELGIUM s.a. (project coordinator), SABERT and SMART FLOW.

Scientific: CERTECH, CTP and UCL.

Additional partnerships: FOST PLUS and PLAREBEL.

REPLIC

SUCCESS STORY

CONSTRUCTION & ENVIRONMENT SECTORS

RECYCLING, POLLUTION PREVENTION & **CO_2 REDUCTION**

CIRCULAR ECONOMY

REPLIC

HOW CAN YOU RECYCLE GYPSUM (PLASTER) **AND TRANSFORM IT INTO HIGH QUALITY GYPSUM USING A PROCESS THAT IS RELIABLE AND VERSATILE?**

GreenWin presents REPLIC:

Development of an industrial unit for the treatment of post-consumption gypsum, with an initial capacity of 12.000T/year and capable of treating waste of various origins (recycling centres, deconstruction ...) to produce high quality gypsum. The innovative aspect of this project comes from the novel combination of mineralurgical techniques which makes for a process that is solid and versatile.

In the light of the success of this project a new enterprise and a new industrial line will be created in 2020.

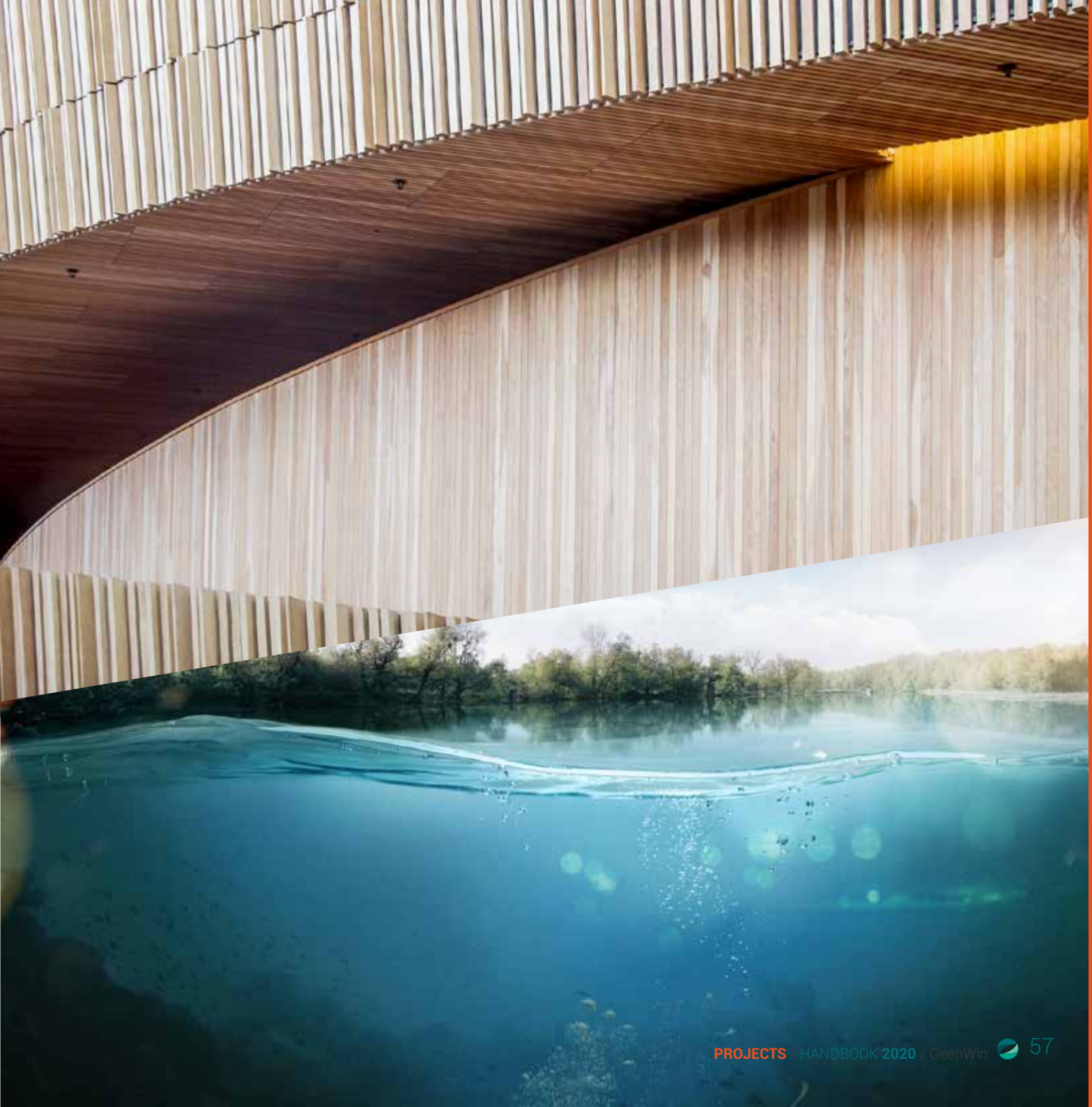
THE « PLUSSES »:

- Efficient, solid and versatile process.
- High quality of recycled gypsum.

Partners:

Industrial: IPALLE (project coordinator), SUEZ, DUFOUR and EUREMI.

Scientific: CENTRE TERRE ET PIERRE and CRIC.




HIGH POTENTIAL
PROJECTS

ACCUTHERM

HIGH POTENTIAL PROJECT

CONSTRUCTION
& CHEMISTRY
SECTORS

ENERGY EFFICIENCY,
SUSTAINABLE MATERIALS
& RENEWABLE ENERGY

POLLUTION
PREVENTION

ACCUTHERM

HOW CAN YOU PROPOSE AN INTEGRATED SOLUTION THAT ALLOWS FOR THE STORAGE OF (COLD) THERMAL ENERGY THAT OPTIMISES THE ENERGY EFFICIENCY OF REFRIGERATION INSTALLATIONS?

GreenWin presents ACCUTHERM:

ACCUTHERM aims to use integrated phase change materials within a complete cold storage system with the final objective of proposing an advantageous alternative to electric batteries that maximises the use of renewable forms of energy (intermittent by definition). Materials used by ACCUTHERM do not harm the environment and are also non-flammable.

The research undertaken has allowed the identification of promising solutions for positive cold storage applications (> 0°C) that can be used at various levels, from the local butcher shop to industrial production halls that require large amounts of cold.

THE « PLUSSES »:

- ACCUTHERM allows for the shifting of peak energy consumption to times when energy is far less in demand and therefore cheaper: 90% of energy needs are concentrated within a period of 8 hours out of 24.
- ACCUTHERM ideally complements renewable energy installations (solar, wind) with the 100% use of free energy these offer.
- The bulkiness of the installation is very limited compared to the volume of cold rooms, a measure of how easy it is to install.
- The system can be installed in « plug and play » on any type of refrigeration installation.
- Unlike with a classic battery, performance does not deteriorate over time.
- The materials used are totally harmless to the environment.

Partners:

Industrial: DESIMONE S.A. (project coordinator) and LEBRUN S.A.

Scientific: CSL (Centre Spatial de Liège) and CRM GROUP.

BLUE V

HIGH POTENTIAL PROJECT

ENVIRONMENT &
GREEN CHEMISTRY
SECTORS

ENERGY EFFICIENCY

TREATMENT OF
WATER POLLUTION

BLUE V

HOW CAN YOU DISINFECT AND DECONTAMINATE WATER WITHOUT THE USE OF CHLORINE, BROMINE OR OTHER UV STERILISERS?

GreenWin presents BLUE V:

BLUE V proposes the development of a new generation of low energy advanced oxidation sterilisers. The system allows for water to be disinfected and decontaminated.

The solution will also be certified for the treatment of recreational waters such as swimming pools and fountains.

THE « PLUSSES » COMPARED TO EXISTING SOLUTIONS:

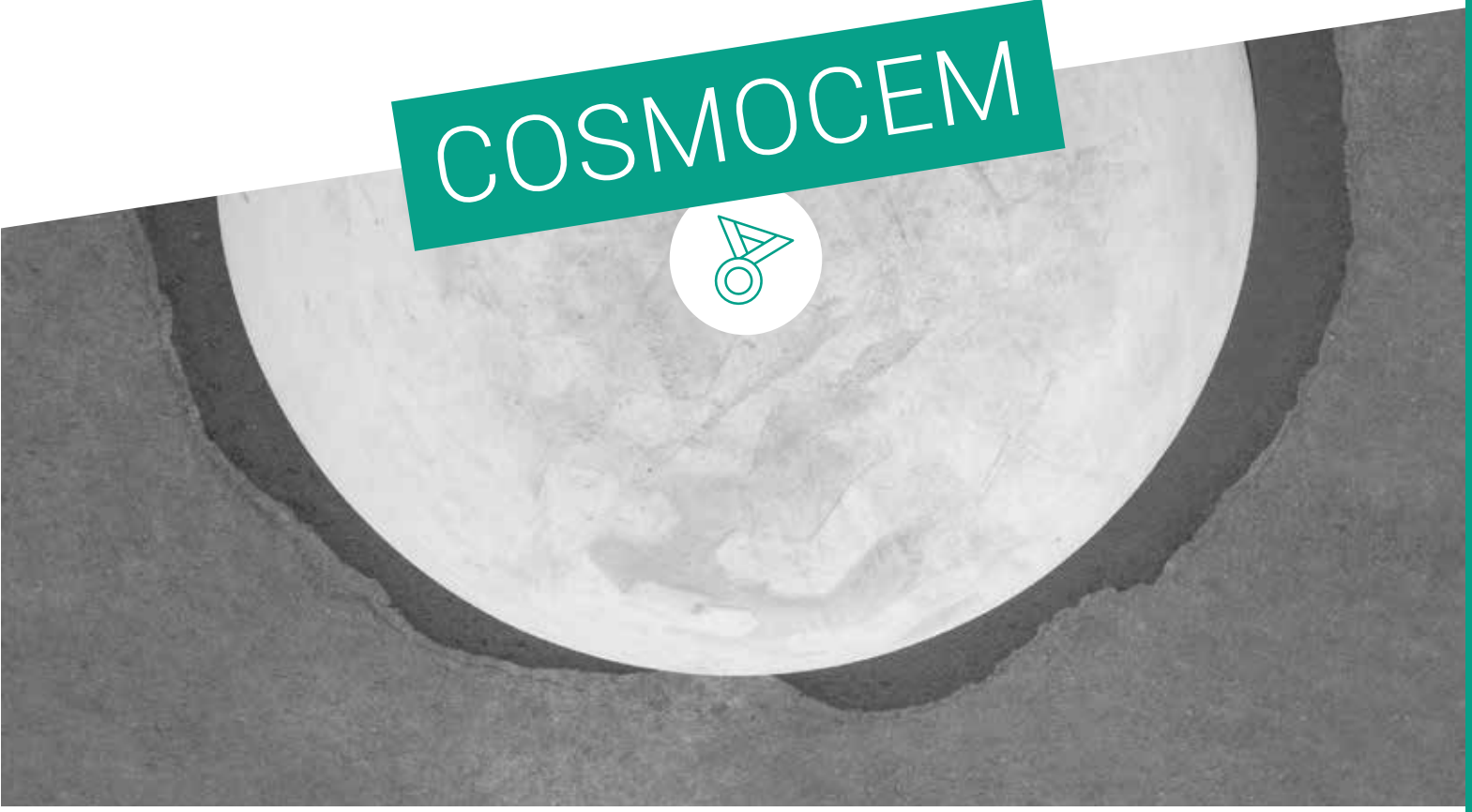
- Simpler and cheaper for the end user.
- More efficient.
- Less energy hungry.

Partners:

Industrial: AQUATIC SCIENCES (project coordinator), MECANIC SYSTEM and GDTECH.

Scientific: CELABOR (research centre of reference for the analysis of water) and NCE-ULIÈGE (chemical engineering laboratory).

COSMOCEM



HOW CAN LARGE QUANTITIES OF ALTERNATIVE SECONDARY MATERIALS (MSA), CURRENTLY WITH NO OUTLET, BE TRANSFORMED TO CREATE NEW ADDITIONAL MINERALS FOR CEMENTS?

GreenWin presents COSMOCEM:

The cement industry faces a number of challenges, namely:

- in terms of materials, a reduction in natural resources and the decreasing availability of mineral additions used in cement, such as blast furnace slag and flue dust;
- on an economic and environmental level, the ceiling on CO_2 quotas along with competing imports of foreign cement and foreign clinker.

HIGH POTENTIAL PROJECT

CONSTRUCTION
& ENVIRONMENT
SECTORS

WASTE
VALORISATION &
CO_2 REDUCTION

CIRCULAR
AND DIGITAL
ECONOMY

In this context, the project's objective is the creation of mineral additives for hydraulic binders resulting from the transformation of poorly or non-valorised Walloon waste streams by a new ecologic activation process operated by Artificial Intelligence.

It is therefore now necessary to find the best way of transforming important MSA streams with few or no outlets or means of being valorised in order to create new reactive mineral additives necessary for the production of cement.

THE « PLUSSES »:

- **For CBR, in addition to maintaining the activity of cement factories in Wallonia:**

  independence from traditional reactive materials; diminution in the shortage of raw materials; a stronger position compared to the competition; improved cost price; improvement in environmental footprint (reduction of CO_2 and less energy-intensive process , clinker substitution (0,8 t CO_2 /t clinker), local streams > reduced logistics, valorisation of greater internal MSA streams, energy-related and predictive monitoring with high tech tools).

- **For the waste treatment sector,** apart from the setting up of a novel sector :
  - Sustainable solution for asbestos-linked waste.
  - Rehabilitation of former industrial sites.

Partners:

Industrial: CIMENTERIES CBR S.A. (project coordinator), DUFERCO WALLONIE S.A., TRADECOWALL SCRL, SBMI S.A. and TECHNORD BELGIUM S.A.

Scientific: CRIC-OCCN (national scientific and technical research centre for the cement industry), CTP (International technological centre for soil and stone), ULIÈGE, CHEMICAL ENGINEERING, PRODUCTS, ENVIRONMENT and PROCESSES (PEP'S).

ECOPUR

HIGH POTENTIAL PROJECT

ENVIRONMENT
& CHEMISTRY
SECTORS

INDUSTRIAL PROCESSES MORE RESPECTFUL OF THE ENVIRONMENT

POLLUTION
PREVENTION

ECOPUR

HOW CAN YOU IMPROVE THE QUALITY OF MATTRESS PROTECTORS FOR THE MEDICAL SECTOR WHILE ADDRESSING MORE STRINGENT SANITARY AND ENVIRONMENTAL CONSTRAINTS?

GreenWin presents ECOPUR:

The ECOPUR project aims to create polyurethane coating for synthetic textiles in accordance with future environmental and sanitary legislation and anticipate future production norms.

Today, the process of manufacturing coatings for use in the making of, amongst other things, mattress protectors (medical sector), requires the use of organic substances that could be replaced by alternatives that are more respectful of the environment.

The ECOPUR project aims to enable the production of mattress protectors using this new polyurethane coating technique.

THE « PLUSSES »:

- Greater respect for the environment.
- Techniques that are more respectful towards workers and users (end-users = patients).
- Future developments geared towards new markets.

Partners:

Industrial: SIOEN FABRICS (project coordinator) and INTERCO.

Scientific: ULIÈGE-PEP'S and CENTEXBEL.

LOWEMI

HIGH POTENTIAL PROJECT

CONSTRUCTION
& ENVIRONMENT
SECTORS

ENERGY EFFICIENCY
& QUALITY OF HOME
ENVIRONMENT &
OF ENVIRONMENT

POLLUTION
PREVENTION

LOWEMI

HOW CAN YOU IMPROVE THE QUALITY OF AIR INSIDE BUILDINGS?

GreenWin presents LOWEMI:

This project is aimed at the development of a range of water-based paints for interior use, as well as a range of decorative films, with very low VOC emissions.

These two product ranges are practically void of any noxious organic compounds likely to be released into the air with time.

THE « PLUSSES »:

- Reduction in the amount of solvents traditionally found in painting and decorating.

Partners:

Industrial: DOTHÉE (project coordinator) and MACTAC.

Scientific: CORI and CSTC.

MASSETTE

HIGH POTENTIAL PROJECT

ENVIRONMENT
& GREEN CHEMISTRY
SECTORS

ENERGY EFFICIENCY &
SUSTAINABLE PROCESS

TREATMENT OF
WATER POLLUTION

MASSETTE

HOW CAN YOU TREAT MICROPOLLUTANTS IN RECREATIONAL WATERS?

GreenWin presents MASSETTE:

The management of water decontamination is very advanced in respect of primary (suspended matter), secondary (liquid matter) and tertiary (nutrients) pollutants. Techniques for reducing micropollutants, however, are either costly in terms of energy, or too specific, or necessitate a total treatment chain, which implies resorting to highly skilled suppliers and the involvement of a number of participants.

The MASSETTE project aims to implement a filtration module and a suitable substrate capable of retaining non-specific pollutants, or a certain number of specific pollutants.

The filtration module will also allow for the launch, mid-function, of cycles for cleaning and regenerating the substrate.

Prototypes have already been produced. The project however still requires analysis on a wider scale.

THE « PLUSSES » COMPARED TO EXISTING SOLUTIONS:

- More simple and less costly for the end user
  (no longer necessary to resort to skilled subcontractors).
- Less energy intensive.
- No intervention needed for maintaining optimal filtration.

Partners:

Industrial: AQUATIC SCIENCES (project coordinator)
and NANOCYL (production and preparation of carbonated filtration substrates).

Scientific: GIGA – ULG (development of specific substrates through biological engineering) and UCL (development of pollution detection).

MEMORIS

HOW CAN YOU UNDERTAKE IN-SITU REHABILITATION OF SITES HEAVILY CONTAMINATED BY MIXED POLLUTANTS?

GreenWin presents MEMORIS:

The reallocation of industrial wasteland for new activities is a major challenge for Wallonia and Europe. These sites are often heavily polluted and soil rehabilitation is required.

The most widespread technique – the excavation of contaminated soils, their transport and storage in technical landfill centres, with or without any treatment – remains costly, is polluting, and poses health risks for those living nearby.

The MEMORIS project aims to develop a bioremediation and monitoring process for the in situ remediation (without excavation) of sites that are heavily affected by mixed pollution and allow their rapid reuse while also preserving the assets presented by their infrastructures.

HIGH POTENTIAL PROJECT

ENVIRONMENT
& GREEN CHEMISTRY
SECTORS

SITE DECONTAMINATION,
SPACE REALLOCATION,
ENERGY EFFICENCY &
LEAN MANAGEMENT*

QUALITY OF THE
ENVIRONMENT

*solution more respectful
of the environment and less costly

THE « PLUSSES »:

The MEMORIS process combines 4 different techniques in a very unique way, each technique being innovative in itself and bringing novel and efficient in situ remediation and monitoring solutions:

- The development of biostimulation and phytoremediation techniques allows for more rapid, more efficient and less costly in situ decontamination.
- The processes developed will be competitive compared to excavation, transport and offsite treatment, or again to the «pump and treat» method of cleaning such cocktails of pollutants that require heavy treatment units and are therefore costly.
- Innovative monitoring techniques will allow to follow the evolution of the decontamination on a regular basis and in the long term, and track any residual risk.
- The **remediation – monitoring pairing** will constitute a new approach for the management and progressive reutilisation of heavily contaminated sites according to the toxicological risks involved.

Partners:

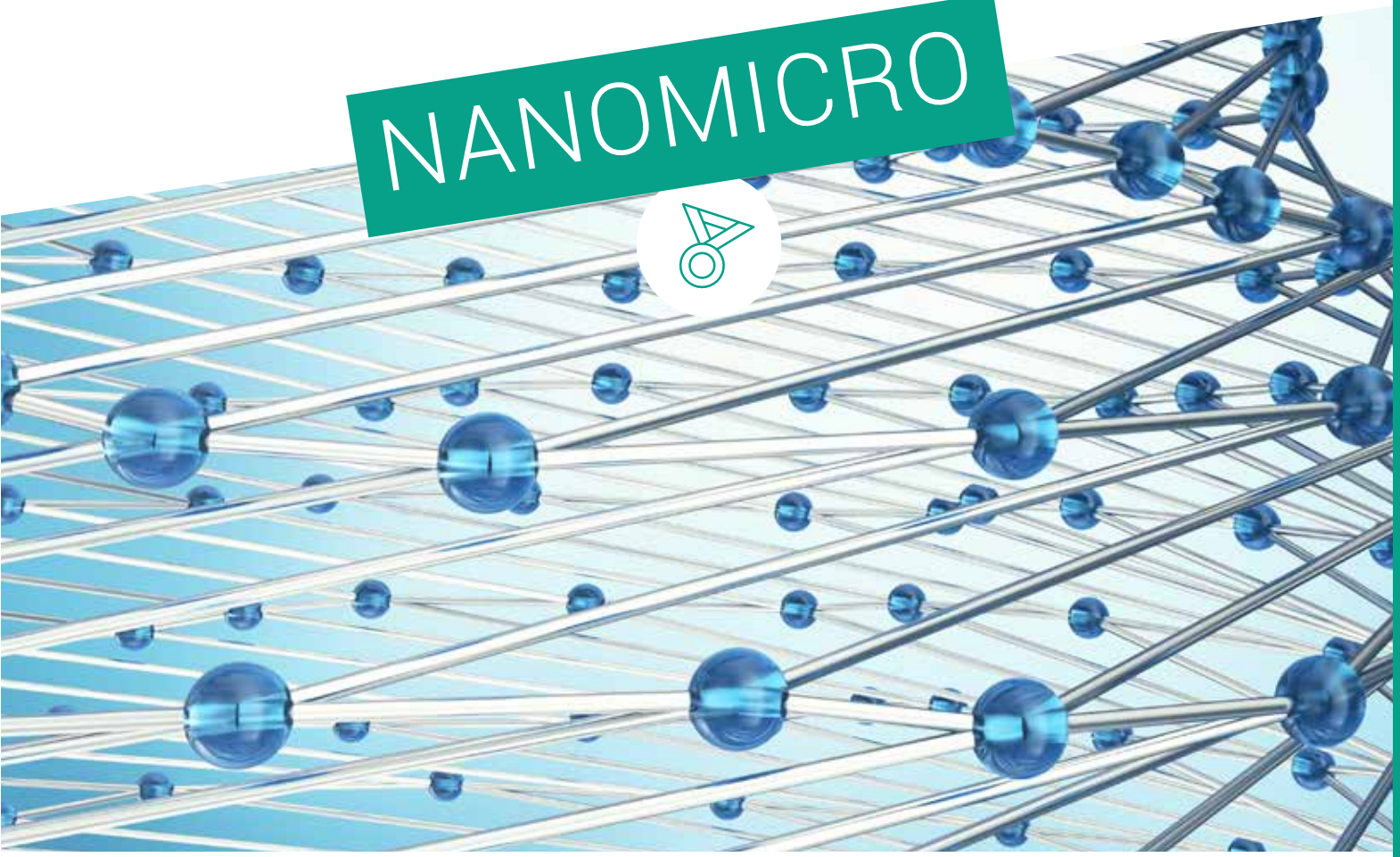
Industrial: DUFERCO WALLONIE and its subsidiary DEEP GREEN (project coordinator) and SITEREM.

Scientific: GEMBOUX AGRO-BIO TECH, UNITÉ SYSTÈME SOL-EAU

UNIVERSITÉ DE MONS (Institute of Science and risk Management):

- *The Fundamental and Applied Geology service of the polytechnic Faculty, which specialises in the geophysical classification of contaminated sites.*
- *The applied Chemistry and Biochemistry service of the polytechnic Faculty, which specialises in decontamination follow-up and chemical analyses.*
- *The Human Biology and Toxicological service of the Faculty of Medicine and Pharmacy that specialises in eco-toxicology.*

NANOMICRO



HOW CAN YOU EXPLOIT POTENTIAL NEW METALLIC NANOPARTICLES SYNTHESISED WITH SPECIFIC MICROORGANISMS FOR USE IN SOIL AND GROUNDWATER DECONTAMINATION?

GreenWin presents NANOMICRO:

Nanoparticles at the service of hydrocarbon decontamination...

Europe in general and Wallonia in particular are characterised by a substantial environmental load as a direct result of heavy industrial activity that left in its wake many forms of pollution affecting soils and groundwater.

HIGH POTENTIAL PROJECT

ENVIRONMENT
& GREEN CHEMISTRY
SECTORS

DECONTAMINATION OF THE ENVIRONMENT & **INNOVATIVE & EFFICIENT PROCESSES**

SITE
REHABILITATION

The different treatment technologies that need to be implemented are as many as the types of pollution themselves; they are costly and ultimately only constitute a «displacement» of the pollution to a confined environment (excavation of soil to be treated). Within this context in situ biological decontamination technologies are definitely guaranteed a bright future, so long as they are made more efficient.

Recent work has opened up interesting perspectives with regards to the use of metallic nanoparticles in biological processes so as to optimise their functioning. The NANOMICRO project falls in line with these new perspectives as it puts forward the conception and application of this type of technology for the biological treatment of liquid effluent and solid matrixes (soils, sediments…) that are contaminated by hydrocarbons (including polyaromatic PAHs). The use of microorganism-synthesised nanoparticles is considered environmentally and economically interesting in view of the significant increase in decontamination rates.

THE « PLUSSES »:

- Improvement in processes of in-situ treatment of contaminated soils.
- Acceleration in biodegradation rate of pollutants.
- Reduction in duration time of treatment.
- Improvement in treatment performances of sites difficult to access or non-accessible (under foundation, underwater, too deep…).

Partners:

Industrial: SANIFOX (project coordinator) and ARTECHNO.

Scientific: ULIÈGE (Department of Chemical Engineering Nanomaterials, Catalysis, Electrochemistry) and TERRA RESEARCH CENTER (Microbial Processes and Interactions: *MiPI*).

REBINDER

HIGH POTENTIAL PROJECT

CONSTRUCTION
& ENVIRONMENT
SECTORS

WASTE MANAGEMENT AND VALORISATION, RECYCLING & **POLLUTION PREVENTION**

CIRCULAR
ECONOMY

REBINDER

HOW IS IT POSSIBLE TO EXTRACT PVB FROM FLAT GLASS WASTE OR AUTOMOTIVE WINDSCREENS AND RECYCLE IT FOR MANUFACTURING BITUMINOUS BINDERS FOR USE IN ROOFING MEMBRANES OR FUNCTIONAL COATINGS?

GreenWin presents REBINDER:

Polyvinyl butyral (PVB) is a thermoplastic which is chiefly used in the manufacturing of security glass and windscreens. At the present time it is a plastic that is not recycled in Wallonia. However, the annual mass of potentially recyclable PVB is estimated at around 10, 000 tons in Belgium.

The REBINDER project aims to establish and perfect a process for the extrusion of PVB from flat glass or automotive glass waste in order to enable its recycling and qualitative refinement.

It is also looking at developing new high value-added industrial applications that can utilise this PVB recyclate in the manufacturing of bitumous binders for roofing membranes and in the formulation of functional coatings.

THE « PLUSSES »:

- Better understanding and improvement of the PVB recycling process.
- Reduction in the quantity of buried plastic.
- Optimisation of 20 % of glass recovered: *economic added value.*

Partners:

Industrial: MINERALE (project coordinator), AVA INDUSTRIALS and DERBIGUM.

Scientific: CENTEXBEL and THE CORI.

RECYGLASS

HIGH POTENTIAL PROJECT

CONSTRUCTION
& ENVIRONMENT
SECTORS

RECYCLING,
POLLUTION
PREVENTION &
CO_2 REDUCTION

CIRCULAR
ECONOMY

RECYGLASS

HOW CAN YOU DEVELOP SYSTEMS FOR THE COLLECTION AND RECYCLING OF END-OF-LIFE GLASS?

GreenWin presents RECYGLASS:

In theory, glass is a material that is indefinitely recyclable: it can be melted down and reshaped without any chemical degradation. In practice, however, two factors get in the way of this perpetual loop: the lack of facilities for the recovery of flat glass, and the purity of the recycled glass. This means that to-date no manufacturer of flat glass currently recycles end-of-life glass in its own furnaces.

The systems needing to be put into place must be developed on the logistics side as much as in the area of the pre-treatment of waste. Overcoming these two obstacles will mean huge possibilities for flat glass reuse for the partners.

Increasing the usage of recycled materials as raw materials provides economic interest owing to the reduction in cost prices and in the energy used by furnaces. It also answers the ecological expectations of consumers and improves the green credentials of companies.

Another aspect of this recycling is the valorisation of the waste (e.g. glass fibres) that is created by the production process.

THE « PLUSSES »:

- Recovery of flat glass currently being sent to landfill.
- Reduction in the use of high quality raw materials which are replaced by used glass.
- Reduction in CO_2 emissions through the utilisation of used glass. Less energy needed to melt down compared to raw materials.
- Development of a Walloon know-how.

Partners:

Industrial: AGC GLASS EUROPE (project coord.), 3B-FIBREGLASS and EUREMI.

Scientific: CENTRE TERRE ET PIERRE and ULB.

REFORGAS

HIGH POTENTIAL PROJECT

CHEMISTRY SECTOR

CO_2 REDUCTION

CIRCULAR ECONOMY

REFORGAS

HOW CAN YOU PRODUCE HIGH VALUE-ADDED MOLECULES FROM BIOGAS USING PLASMA TECHNOLOGY AND CHEMICAL CATALYSIS?

GreenWin presents REFORGAS:

REFORGAS proposes a new method for producing high value molecules from biogas (CO_2/CH_4 mix) that uses a combination of plasma technology and chemical catalysis.

The use of plasma technology allows for energy to be supplied exclusively by intermittent renewable electricity. Via this original process, the waste-generated biogas can be upgraded at low energy cost into high value molecules such as acrylic acid. Acrylic acid can then be transformed into polymers that can be used in the manufacturing of a variety of objects. The CO_2 contained in the biogas is thus immobilised in the plastics that we use on a daily basis.

This makes REFORGAS a potential solution for fighting greenhouse effect gas emissions and therefore global warming, but essentially a new path towards sustainable chemistry.

THE « PLUSSES »:

- Possible solution for combatting greenhouse gas emissions and therefore global warming.
- New path towards green chemistry.

Partners:

Industrial: TOTAL (project coordinator), VANHEEDE and VENTIS.

Scientific: MATERIA NOVA and UMONS.

GLOSSARY

AISBL:
International non-profit making association

AWEX:
Agence Wallonne à l'Exportation (Walloon Export Agency)

BIC:
Biobased Industry Consortium:
private sector component of the public-private partnership BBI JU - see below

BBI JU:
Biobased Industry Joint Undertaking:
European public-private partnership for the emergence of a bioeconomy in the European Union

CRA-W:
Centre de Recherche Agréé wallon
(Walloon Certified Reseach Centre)

CVBB:
(Conférences de) la Chimie Verte et les Biotechnologies Blanches (Conferences on green chemistry and white biotechnologies)

FTE:
Full Time Equivalent

LE:
Large Enterprises

LCIP:
Life Cycle in Practice

LCA:
Life Cycle Analysis

PEPIT:
Polymers Ecocircularity Platform for an Industrial Transition

SCOT:
Smart CO_2 Transformation European programme

SME:
Small and Medium-sized Enterprises

SPIRE:
Sustainable Process Industry through Resource and Energy Efficiency (European public-private partnership)

SPW:
Service Public de Wallonie
(principal administration of Wallonia)

WALOSCRAP:
Convention – in two parts – The Walloon Region has entrusted GreenWin with the task of identifying non-valorised waste deposits and proposing treatment, recycling and valorisation avenues

WBI:
Wallonie Bruxelles International:
Agency responsible for the international relations of Wallonia and Brussels

WG:
Working Group


GREEN
W!N
FROM
INNOVATION
TO BUSINESS

Wallonia.be

Avec le soutien de la Wallonie

GREEN WIN
FROM INNOVATION TO BUSINESS

www.greenwin.be