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UNIQUE ANSWERS TO MULTIPLE ENVIRONMENTAL CHALLENGES

Belgian eco-solutions leading the way

Belgium is not only the beating heart of Europe, but also a dynamic green biotope where many new environmental technologies are developed. Belgian companies are often pioneers in approaching the challenges of a 'greener' and more energy-efficient economy. They invest heavily in research and development for efficient environmental solutions. While they have chalked up many successes, there is still no shortage of potential new applications ripe for development. Below is an overview of the broad range of services and products offered by Belgian businesses active in the environmental sector.



It is becoming clearer by the day that the expanding population and economic growth are putting major pressure on our planet. Rising emissions of greenhouse gases are causing climate change. Since the Industrial Revolution the concentration of CO₂ in the atmosphere has risen by more than 35%, from 280 to 379 ppm (Source: IPCC, 2007). The earth is no longer in a position to support our wellbeing and growing pro-

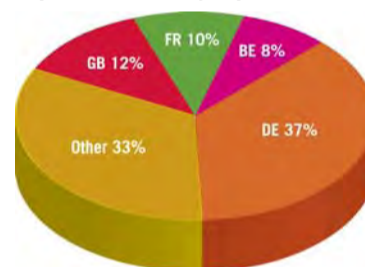
logical innovation is essential. One specific suggestion is for partnerships between countries be strengthened so that knowledge and best technological practices can be better disseminated.

Europe leading the way

To gain a better understanding of how Belgian and European businesses can address the climate challenge, the renowned business school Insead produced a research report for the Federation of Enterprises in Belgium (FEB) entitled *Greening the economy: creating a climate for change*. A comparative analysis between Europe and major countries based on energy performance, eco-innovation and invest-

ment internationally in terms of eco-innovation. For instance, the European Union scores very well indeed in terms of the number of patent registrations for motor vehicle abatement technologies (50.3%), waste management (37.8%) and renewable energy (44.8%).

European eco-industry exports

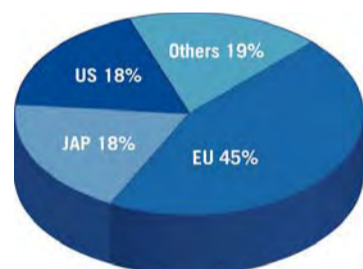


Source: Ernst & Young

“Belgian eco-business makes a significant contribution to global climate challenges”

ment in clean technologies shows that European industry is a world leader in terms of efficient use of energy and also performs

Country share in renewable energy patents



Source: OECD

ment in clean technologies shows that European industry is a world leader in terms of efficient use of energy and also performs

“EU businesses can play a crucial role in global technology transfer and exchange of best practices targeting higher energy efficiency, lower CO₂ emissions and renewable energy”, says **Rudi Thomaes**, CEO of the Federation of Enterprises in Belgium. “For instance, with regard to wind energy, European expertise enjoys an international reputation.” In the North Sea, off the Belgian coast, the world's most complex offshore wind farm is under construction. Belgian businesses are clearly not missing the green train.

Innovation with Belgian market leaders and experts

While the eco-innovation market is growing at full speed, many Belgian businesses have become world leaders in renewable energy, water management and waste processing, as well as experts in energy efficiency, air purification, soil remediation and sustainable construction. In a worldwide ranking of countries by clean energy technology sales (WWF, November 2009), Belgium holds eighth place. In addition, if we look at European export figures in detail, we see that five countries

account for 75% of eco-industry exports: Germany, the United Kingdom, France, Belgium and Italy. “Belgian eco-business makes a significant contribution to global environmental and climate challenges, and offers solutions that anticipate the expectations of local governments, residents and business”, says Thomaes (FEB). Belgium is home to many innovative solutions supported by internationally renowned university and private research centres. This document gives a broad view of Belgium's multifaceted eco-technology sector.

FEDERATION OF ENTERPRISES IN BELGIUM (FEB)

This document is an initiative of the Federation of Enterprises in Belgium (FEB). The FEB is Belgium's leading employers' organisation, and, via its sectoral federations, represents more than 33,000 businesses, including 26,000 SMEs, active across Belgium in industry, construction and the services sector. The FEB represents businesses in some 150 federal, European and international bodies.

The following values and principles guide the action taken by the FEB vis-à-vis its member sectoral federations, businesses and dialogue partners: social market economy, sustainable development, ethical business, corporate governance, consultation and self-regulation.

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Renewable energy: From bold projects to original products



According to the International Energy Agency (IEA), global energy consumption will rise by half by 2030. The sun, wind and water are potential energy sources that can spare the climate. Consequently, Europe has opted to promote sustainable energy inside and outside its borders. Although Belgium has limited potential for renewable energy applications, this small country is actually quite big when it comes to know-how in this area. Belgian expertise has enjoyed a global reputation for efficiency for some time now.

“Developing clean power generation is a challenge for the entire planet. Belgium

is home to many companies that are innovative in the area of renewable energy. Evidence of this can be found in a report by Roland Berger and WWF (November 2009) which ranks Belgium in the world top 5 for wind turbines, after Denmark, Spain, Germany and India. It is our job to encourage these businesses to forge partnerships with other countries”, explains **Rudi Thomaes**, CEO of the Federation of Enterprises in Belgium.

WIND ENERGY: FROM THE LARGEST WIND FARM TO THE SMALLEST TURBINE

Belgium has internationally recognized expertise in wind energy. That is not just some idle claim; it can be backed up with real-life examples. One key example is **Hansen Transmissions**, the market leader in gearboxes used in wind turbines. This company exports 98% of its output worldwide. In its wake, a number of Belgian companies have developed spe-

cific know-how in wind energy. Examples include **3E**, **Technum**, **CFE** and **Tractebel Engineering** in engineering and design, **Numea International** and **LMS International** in design software, **Siemens** in wind turbines, **CG Power Systems Belgium** (formerly Pauwels Trafo) in transformers and **CFR** in steel bevel gears. **Alex Nick**, Vice President Global Plates at ArcelorMittal, the parent company of CFR, says: “Steel is a green material. Our bevel gears can be found in one out of every three wind turbines in the world. We want to ride the strong tide of growth in this sector.” That explains why, in early 2008, the global market leader in the steel industry approved an investment plan that will increase CFR's production capacity by 30%. **Iemants**, **Psi Control**, **Acrosoma**, **Jonckheere subcontracting**, **Multi-Contact**, **Sanha Fittings**, **Belwind** and **Infinity** are also active in the wind energy sector.



www.hansentransmissions.com
 www.3e.be
 www.technum.be
 www.cfe.be
 www.tractebel-engineering.com
 www.numeca.com
 www.lmsintl.com
 www.powergeneration.siemens.com
 www.pauwels.com
 (CG Power Systems Belgium)
 www.arcelormittal.com
 www.lemants.com
 www.psicontrol.com
 www.siemens.be
 www.acrosoma.com
 www.jonckheeresub.com
 www.intersolution.be
 (www.multi-contact.com)
 www.sanha.com
 www.eneco.be (Belwind)
 www.enfinity.be

Unique project in the North Sea

"Le vent du Nord qui fait craquer les digues", crooned Jacques Brel, one of the greatest Belgian singers ever, in a song about the ferocious north wind so strong that could blow away the mighty dykes. In fact, a unique complex of wind turbines is planned for the North Sea coast, and the first section of six wind turbines came on-stream on 10 May 2009. Together, there are seven projects that will generate more than one tenth of Belgian power consumption, accounting for a total of 2,300 MW. The first of the seven projects is already a 'first'. "Never before has an offshore project been so ambitious as to develop so much capacity (300 MW) at such a great depth (up to 27 metres) and so far from the coast", emphasises **Filip Martens**, general manager of **C-Power**, the company responsible for developing and implementing this first part of the offshore wind farm. The C-Power project alone involves some 40 Belgian companies, including engineering (**Tractebel Engineering**), civil engineering (**CFE**) and offshore and onshore cables (**Fabricom**). The turbines are supplied by Germany's **Repower**, a sister company of Belgian firm Hansen Transmissions. "The company has the in-house capacity to develop speed-increase gearing for the 5 MW turbines used in this project", says Martens. Belgian group **DEME**, a world leader in dredging technologies, is involved in some of the offshore wind projects. Of the nine offshore wind farms already built in the world, six called on its maritime construction know-how – specifically in the Netherlands, Scotland and Scandinavia.

Buoyed by this experience, DEME is the pacesetter for the C-Power project, deploying 28 ships that have been specially fitted out for works at sea.

www.c-power.be, www.deme.be

Leader in medium-sized wind turbines

Belgian company **Turbowinds** is a major player in building wind farms on a smaller scale. "A 600 kW wind turbine, our standard type, saves 130,000 litres of fuel per year and reduces CO₂ emissions by 1,250 tonnes per year compared with a conventional power station. It can provide energy for 500 families on average", says **Jean-Pierre Dutry**, founder and CEO of Turbowinds. The Belgian company, which mainly employs engineers, makes medium-sized wind turbines (300 kW to 1 MW). "Our T-type range in particular soon became the standard in its class. The T-type combines a high level of reliability, top quality and superb performance with a low basic investment and limited maintenance costs." The company has many satisfied customers around the world, including in California, Australia, Japan, Greece, China and Ukraine. Turbowinds also delivers complete green power installations with the appropriate technical support worldwide.

Small wind turbines that can be folded away in bad weather

Via its subsidiary **TML** Turbowinds also makes small wind turbines (25 kW) that can be folded away when storms or typhoons approach. "Perfect for an agricultural environment", says Dutry. "These wind turbines are also easy to install manually – no crane needed – which significantly reduces transport and installation costs. In addition, they can work in 'hybrid' mode with a diesel engine." **Jean-Pierre Dutry** sees extensive markets around the world. His products are already being manufactured under licence in Ukraine, India and soon in Vietnam.

www.turbowinds.com

SOLAR ENERGY: AN INTEGRATED CHAIN OF OPPORTUNITIES

The global market for solar energy is rising 30% per year on average. Many innovative Belgian businesses have created and developed their niche in this market. A fully fledged chain has emerged, running from the production of photovoltaic cells via the production of modules to the assembly of solar panels.

PRINCESS ELISABETH SOUTH POLE STATION: ZERO EMISSIONS

The construction of the Princess Elisabeth scientific research station (named after the oldest daughter of **Prince Philippe**, heir to the Belgian throne) in Antarctica is evidence of Belgium's sweeping environmental ambitions. The project is led by the international Polar Foundation and its charismatic chairman, Belgian researcher **Alain Hubert**. His ambition: "To contribute to a better understanding of global climate change". The Princess Elisabeth South Pole Station, officially inaugurated on 15 February 2009, is the only zero-emission polar base. It combines environmentally friendly materials with clean, efficient energy use and the best waste management technologies. The technology and equipment being deployed to keep the station's ecological footprint in Antarctica to a minimum are the result of international and Belgian know-how. Belgian companies have supplied materials, equipment and concepts. **Philippe Samyn & Partners** and **3E** provided engineering know-how. **ADW Software** developed an appropriate surveying programme, **lemants** built special metal structures. **Smet-Boring** handled ground anchoring, and so on. The works were coordinated by **Besix**, Belgium's largest construction firm.



© International Polar Foundation/Rene Robert

www.antarcticstation.org

Innovative cells

Photovoltech, producer of photovoltaic cells, is aiming for a 4 to 5% share by 2015 on a rapidly growing global market. In renewable energy, the company is a key link in the growth strategy pursued by Total, one of the shareholders in the Belgian company. "We are setting up rural solar power programmes in South Africa, Morocco and Mali that provide thou-

sands of families with light, power their televisions and refrigerators and improve their standard of living", says **Philippe Costerg**, Solar Power Manager at Total in one of the company's publications. Photovoltech is held by IMEC (Belgium's Interuniversity Micro-Electronics Centre), one of the largest European research centres in microelectronics, and by the French groups Total and Suez via their Belgian subsidiaries Soltech and Electrabel.

"Developing clean power generation is a challenge for the entire planet. Belgium is home to many companies that are innovative in the area of renewable energy"

Autonomous systems for a range of applications

Soltech, an IMEC spin-off, has also worked on the development of KoraSun photovoltaic panels: it develops the built-in modules, while also designing autonomous photovoltaic systems for lighting, telecommunications, rural hospitals, water pumps, telemetry, road and waterway signs, and remote homes. Soltech provides efficient solutions, especially in areas that are not connected to power grids. For instance, it has provided lighting systems for remote areas in Cambodia and Mali. In Belgium, slate manufacturer **Eternit** has an integrated solar panel solution that also creates an elegant shape on the roof. Eternit's Arizona panel – a slate and solar panel combined in a single unit – can be installed quickly and easily. It is durable and maintenance free, and can be used on a large scale.

New and much more efficient raw material

Silicon is the raw material for solar cells. And Belgium is a leading player here too. **Umicore** has operations on all continents and specialises in materials technology as well as raw materials technology. Together with Norway's Hydro group, it set up **Hycore**, a joint venture to develop and produce photovoltaic silicon for use in solar cells. Hycore produces silicon that is much more energy efficient than that produced by conventional processes. Production happens in a closed cycle with the most important components being recycled. This invention has already resulted in multiple patent applications. In 2010 the Hycore test project in Porsgrunn (Norway) can start initial production of this brand new silicon. If everything goes according to plan, industrial production will begin in 2013. As the world leader in germanium, a very rare material, Umicore has been active in this sector for quite some time: the extremely thin and pure germanium substrates (or wafers) are very popular as the base material for solar cells in space, where size, efficiency and power are crucial. These substrates are used in the majority of the satellites launched today. The germanium substrates are also used as the base material for the solar panels used on NASA's Mars Exploration Rovers. Umicore has resolutely opted to follow the path of clean technologies. "They account for 80% of R&D investment", says **Marc Van Sande**, Chief Technology Officer. "Umicore wanted to complete the cycle for all

of its materials. These have evolved into high-tech materials, for which we have developed solutions that enable users to produce, store and renew energy more intelligently than ever." **ENE, DeSimone, Elsingor, IneltraSystems, GreenEarth Energy & Technology, Solergia, Trieco** are also active in the field of photovoltaic solar power and have extensive experience in deploying photovoltaic solutions.

www.photovoltech.be
 www.koramic.com
 www.soltech.be
 www.etermit.be
 www.umicore.com
 www.recticel.com
 www.ene.com
 www.desimone.be
 www.elsingor.be
 www.ineltra-solar.be
 www.green-earth-energy.com
 www.solergia.be
 www.trieco.be

BIOMASS: A SERIES OF BELGIAN TECHNOLOGIES

Heat and energy from wood waste

Biomass is receiving a lot of attention today due to skyrocketing energy prices. The best known type of biomass is wood, which is the main source of energy in many countries. Not only can wood be used as a fuel in the conventional combustion process, but it can also be efficiently converted into electricity and heat via cogeneration. Belgian company **Recybois** has developed an integrated concept for processing wood waste and sawdust. A cogeneration power plant is fuelled with wood waste from waste disposal sites in two provinces and from multiple industrial customers. "Part of the electricity generated is used for companies' in-house requirements and part is injected into the public grid as green power. The heat produced is used to dry wooden pallets", explains **Bernard François**, general manager Recybois. **Xylo watt**, a spin-off from the University of Louvain (UCL), is delivering a fully fledged cogeneration system to produce electricity and heat from gasifying wood chips. The wood is converted into a combustible gas and processed in a cogeneration unit, delivering electricity and heat. According to Xylo watt, its wood gasification-driven cogeneration units are an ideal solution for providing electricity and heat for villages, local authorities or industrial sites. Other Belgian companies active in this sector are **TPF- Basse Sambre, Keppel-Seghers, Fabricom** and **Siemens**.

www.recybois.be
 www.xylo watt.be
 www.tpf-bs.be
 www.keppelseghers.com
 www.fabricom-gti.com
 www.siemens.be

Energy from nearly all industrial biomass residue

Vyncke Energietechnik is an attractive Belgian partner when it comes to reusing industrial biomass residue as fuel. With its specialised experience in combustion technology, boiler building and control and command technologies, it can offer an end-to-

The **Agoria Renewable Energy Club (AREC)** is a network of experienced Belgian companies providing solutions, products and services for renewable energy projects, focusing specifically on wind energy, solar energy (thermal & photovoltaic) and biomass. AREC brings together the most prominent Belgian companies with specific know-how and experience in innovative solutions for renewable energy projects.

www.agoria.be/AREC



Leading Companies in Renewables in Belgium Join Forces

Addressing the energy challenge with creativity & technology

Did you know that Belgium is home to numerous successful companies specializing in renewable energy? In the fields of biomass, wind and solar energy (both thermal and photovoltaic) Belgian companies can boast proven track records. And did you know that these companies have joined forces to offer their services to customers abroad? In the Agoria Renewable Energy Club, both local and international companies active in renewable energy, in the broadest sense possible, have formed a unique network that paves the way for the Belgian renewable energy sector on the international scene.

The Agoria Renewable Energy Club was established by a cluster of leading technology companies in January 2008. Agoria, the trade association of the Belgian technology industry, provides the framework for the organization's activities. "Our aim is to promote our members' expertise in renewable energy abroad and to identify and create international business opportunities", says Club President Dr. Jan Declercq. True to the Belgian motto 'Strength through unity', more than 80 companies have joined forces in a high-



Belgium has set new standards in renewable energy generation, for example, by the recent installation of a wind park with eleven 7MW wind turbines with rotors of 127 meters in diameter – the world's most powerful turbines to date. Image courtesy of Windvision.

“Belgium houses a rich and varied landscape of companies in the renewable energy industry. The Agoria Renewable Energy Club groups these businesses and provides me with a unique point of contact to add to my international network.”

Terry Tamminen - Secretary of the California Environmental Protection Agency for Governor Arnold Schwarzenegger



quality network that covers every aspect of the renewable energy business.

Expertise in the heart of Europe

In the last few decades Belgium has become a leading supplier of renewable energy technologies for projects worldwide. Here is a fine example: one out of every three wind turbines worldwide with a rated capacity of over 2 megawatts contains technology developed in Belgium. "It takes the combined expertise of companies active in Belgium – both large concerns and SMEs – in every field of renewable energy to achieve this. What we do is create synergies by facilitating this process abroad", Declercq explains.

Strength through diversity

The broad range of activities covered by its member companies is what makes the club such a strong network. Declercq: "Most of our member companies have a technological core business, such as the production of photovoltaic panels or gearboxes for wind turbines. Others focus on different – but in no way less important – aspects of the renewable energy business, like specialized management consultancy, communications and equity financing."

The demand for cooperation on the international scene as a single business cluster, yet in a multidisciplinary format, arose within these different companies. Because there is a

high level of commitment, the club has evolved in a short time to a well-run organization creating, each year, a number of far-reaching initiatives for its members.

Empowering its members

There is a multitude of advantages in being a member of the cluster of companies. The club strives to promote the know-how and excellence of its members abroad. It increases visibility and aims to generate international business opportunities. This is achieved in a number of ways: by providing a structured overview of solutions and project references in order to serve as a single point of contact. But also by supporting and organizing prospecting activities abroad.

In addition, it constitutes a unique executive business platform for its members. "We facilitate networking between our members in Belgium to give them an opportunity to exchange experiences and contacts, discuss new projects and technologies and keep abreast of developments in the renewable energy sector in general", Declercq explains. "We also foster business networking abroad, and organize formal contacts with 'visionaries',



Local leading players in renewables recently established Galaxia in Belgium, a hi-tech incubation center for space-related activities and Europe's largest photovoltaic installation integrated into a single building. Designed by Samyn & Partners.

“The integration of renewable energy technologies into architecture requires a revolution in sustainable building design. Thanks to the Agoria Renewable Energy Club, I was able to get this message across to a selection of Belgium's top-players in the industry.”

Gordon Gill - Partner at Adrian Smith + Gordon Gill Architecture



venture capitalists, consulting engineers, raw material suppliers and government organizations."

Backed by solid partners

Keeping up-to-date with the latest developments in renewable energy is the purpose of the partnership between its corporate members and a large knowledge pool of internationally renowned R&D centers and universities. Its strategic partners, **Generaties** and **Tweed**, team up with the Agoria Renewable Energy Club to advance in the global renewable energy market through proactive and structural R&D support. For financial assistance, the club can count on the Flemish agency for Innovation by Science and Technology **IWT** and Belgium's three regional export supporting agencies: **Flanders Investment & Trade**, **Brussels Export** and the Walloon export agency **AWEX**.

"By choosing a club member company to carry out a project, not only is this a rock-solid guarantee that a project will be backed by a leader in its domain, it also ensures that it will benefit from the state of the art in matters of technological and scientific innovations", Declercq concludes. "Generaties and Tweed, for the Flemish and the Walloon regions respectively, support our member companies through innovation incentives, the follow-up of generic technologies and markets, the international promotion of technology domains and by giving companies with renewable energy activities a strategic position abroad."

Belgian Renewable Technology is Shaping the World

The Agoria Renewable Energy Club offers leading local and European companies in the field of biomass, wind and solar energy in Belgium a unique platform for innovation and international business development. So that they can optimally provide governments, organizations and companies around the world with sustainable, high-quality solutions in renewable energy.

Would you like to know more on Belgian-based expertise in renewable energy technology? Or do you want to get in touch with one of these companies? Please, contact the Agoria Renewable Energy Club through François de Hemptinne at +32 2 706 79 39 or via francois.dehemptinne@agoria.be.

www.agoria.be/arec

Our innovation & technology partners

Our financial partners

► end solution to all manner of problems: design, engineering, construction, installation, assembly, commissioning, training and follow-up. Biomass – e.g. palm oil clusters, rice husks, pruning waste, wood waste and so on – is converted into clean energy in the form of steam, hot water, thermal oil, hot gases, electricity or any combination thereof. The core of Vyncke's combustion installations is the patented Dynamic Watercooled Step-grate DWS. This is one of the most available combustion technologies and can be used for all sorts of biomass waste, regardless of the granulometry or moisture content. Vyncke is one of the only companies in the world able to process empty palm oil clusters and turn them into energy, as done in Malaysia and elsewhere. Vyncke has a global presence in countries such as Germany, the Czech Republic, China, Thailand, Malaysia, Singapore, Australia, Canada and Brazil.



www.vyncke.com

Collection of Belgian biomass know-how

Various Belgian companies active in renewable energy sources have been working together with universities and the government since 2005. Specialist firms are focusing on R&D to promote bio-energy and are evolving into an internationally recognised growth attractor for industrial bio-energy projects and activities under the name **Ghent Bio-Energy Valley**. The **TWEED** cluster brings public and private sector energy organisations together to boost synergies and encourage investment in that sector.

Clustering bio-energy companies has the potential to significantly lower costs and increase the eco-efficiency of production systems. Especially unique is the total integration on a single site, from raw material to refined end product, without any intervening transport. The industrial members of the Ghent Bio-Energy Valley currently consist of the companies Alco Bio Fuel, Axtoll, Bioro, BnS Engineering, Capricorn, Cargill, Desmet Ballestra, Electrabel, Ernst & Young, Fabricom, GCM, Genencor, Lalemant, Oiltanking, Oleon, Organic Waste Systems, Sea-Invest and SPE. The members of TWEED include ACV Manufacturing, Shanks, Axima Services (GDF SUEZ), Fabricom, CMI, Nexans, Sun Technics, Greenwind, Renogen, Cegelec, Suez, Waterleau, Xylowatt and De Smet Engineers & Contractors (DSEC), a general contracting company specialized in the agro-industrial field. **DSEC** is now making its know-how available in other fields, including bio-energy and agro-chemical sectors. **Waterleau** is an important keyplayer in the domain of biomass-to-energy projects. ●



www.gbev.org

clusters.wallonie.be/tweed

www.dsengineers.com

www.waterleau.com



Better energy efficiency on many fronts

Rising energy demand and the absolute need for lower CO₂ emissions are forcing us all to be more efficient with energy. A great many measures can be taken in terms of energy efficiency that not only help the environment but also save money. Consequently, leaders in many nations have decided to set ambitious targets for higher energy efficiency. After all, implementing energy efficiency measures can create jobs relatively quickly, improve competitiveness and reduce dependency on energy imports. Key examples can be found in building fittings, such as insulation and efficient lighting and heating systems. Belgium is home to several companies that have evolved into world specialists in improving energy efficiency, be it in building materials, building fittings or energy generation.

Belgian polyurethane provides global insulation

Belgian company **Recticel** is a global specialist in the production of polyurethane (PU) insulation panels. The Eurothane and Powerdeck insulation panels provide excellent thermal insulation for all parts of a building thanks to high insulation capacity, superb shape retention, lightness, easy handling, high resistance to wind loads and excellent fire behaviour. Recticel is the market leader in most of its businesses and has 117 sites in 27 countries. The group is mainly active in Europe, but is also acquiring market share in the United States and Asia. **Soudal**, a Belgian manufacturer of specialised chemicals for the construction industry, has been playing a pioneering role for two decades in the development of new expanding, semi-flexible insulating PU foams that can be used to easily fill joints and gaps. With its sites in 24 countries around the world, the company can deliver technical and logistical services wherever they are needed.



www.recticel.com, www.soudal.be

Solar control glass and window frames

Various Belgian manufacturers offer energy-efficient solutions for windows. Glass-maker **AGC Flat Glass**, Europe's market leader in the production of flat glass, has been supplying glass with solar control coatings from its Belgian site since the year 2000. These glasses contribute to more efficient energy consumption. **Deceuninck**, a world player in window frames, provides PVC frames. They have excellent insulation ratings, ensuring minimal heat loss. According to the manufacturer, this sys-

tem also ensures better noise insulation, optimal wind and watertightness, increased safety, ease of maintenance and a long life. Deceuninck has been a global market leader for some time now, is active in more than 75 countries and has 35 production and/or sales subsidiaries in Europe, North America and Asia. The family-owned company **Reynaers Aluminium** are pioneers in the speciality area of insulating aluminium profiles. Reynaers also devised its own solar control system for buildings. The Brise Soleil system is an attractive and practical solution that is affixed to the facade, providing protection

“Belgian companies are world specialists in improving energy efficiency”

from heat and dazzle. **Bekaert** is a global supplier of glass films applied to windows in buildings and cars; it is the market leader in this segment. Glass films provide protection from solar heat (without cutting out too much visible light), filter out UV light and hold the glass in place if broken. The world's first windproof solar control screen was also designed by a Belgian company: **Renson**. Renson entered the 21st century as the European market leader and a trendsetter in natural and continuous ventilation systems that purify the indoor climate.



www.reynaers.com

www.renson.be

www.agc-flatglass.eu

www.deceuninck.be

www.bekaertfilms.com

Energy-efficient lighting and smart home automation lead to massive savings

ETAP Lighting designs, produces and sells lighting and emergency lighting luminaires. The common theme in the development and production process is energy efficiency and ergonomics. Every year the company invests 6 to 7% of its turnover in research and development. “By combining intensive research with technological development, we are able to produce energy-efficient lighting installations. The materials used in the luminaires have also evolved. Today we use highly reflective aluminium only”, says **Christ’l Joris**, CEO of ETAP Lighting.

Lighting control is also growing in importance. ETAP is a trendsetter here too as the exclusive distributor for the European market of a software package called Energy & Light Manager (ELM). This is an advanced control system that can lead to energy savings on lighting of up to 75% and can optimise light quality at the workplace. “The luminaires can be adjusted via a light sensor. Add in the ELM user-friendly software and the entire system can react quickly to every changing lighting requirements in a building. This virtually eliminates wasted energy”, explains Christ’l Joris.

The **Schröder** group, which enjoys a global reputation for its public lighting (street, architectural, design, industrial and tunnel lighting), also has a major R&D centre in Belgium to improve the energy efficiency of its products. Schröder focuses primarily on LED technology in lighting applications owing to the great potential they offer: compactness, long life, limited maintenance requirements, white light, rising light efficiency

and nearly inexhaustible design potential for creating colour and atmospheric lighting. Automatically dimming lights, adjusting the temperature or having washing machines run during the most economical time of day can also lead to major reductions in energy consumption. **Niko** is a Belgian company that supplies smart home automation systems able to control lighting and temperature in such a way as to ensure comfort at all times, while keeping energy consumption as low as possible.



www.etaplighting.com

www.schreder.com

www.niko.be

Heating and lower consumption

Buildings can also be heated efficiently. The Belgian company **Jaga** developed the Oxygen radiator, a low-H₂O radiator with a smart air replacement system. If there is too much CO₂ or moisture in a room, then the polluted air is quickly replaced by clean air from outdoors. In Europe, this Belgian company accounts for 75% of the production of copper-aluminium low-H₂O radiators. Jaga has sites in Belgium, France, the Netherlands, the UK and Germany. It operates across Europe and exports to America, Australia, China and Japan.

Dovre, the specialist in high-efficiency cast iron stoves and fire-burning stoves, has a major production site in Belgium. The latest generation of Dovre stoves is fitted with a unique double combustion system. Secondary air enters the stove through the back and is then heated and channelled to the combustion chamber. With this kind of secondary combustion, those flue gases that have not been fully combusted can be reignited. Result: a higher heat yield and cleaner, environmentally sound combustion. ●



www.dovre.be

www.jaga.be

MORE EFFICIENT ENERGY PRODUCTION

Tractebel Engineering is the SUEZ Group's engineering consultancy for energy and infrastructure. The company delivers the most advanced energy solutions and advises public and private customers on electricity, nuclear power, gas, industry and infrastructure. This Belgian company specialises in those sectors where sustainable development plays a key role, including energy. Its offering includes various types of power station for generating nuclear power, heat and hydropower, renewable energy and energy transmission.

SCK•CEN is one of the largest research centres in Belgium, offering various services to the nuclear industry, the medical sector and the government.

www.tractebel-engineering.com

www.sckcen.be

Belgian air purification transport and industry

Improving air quality is one of the challenges that we need to tackle when it comes to sustainably managing planet earth. Vehicle traffic, industrial processes and building heating systems release flue gases, carbon monoxide, carbon dioxide, heavy metals and more into the atmosphere. Many large cities, from Beijing to Cairo, suffer from air pollution, which in turn often leads to numerous health problems for local residents. In air purification, Belgian environmental technology offers a wide range of innovative solutions and applications.

One of every three car catalytic converters in the world is Belgian

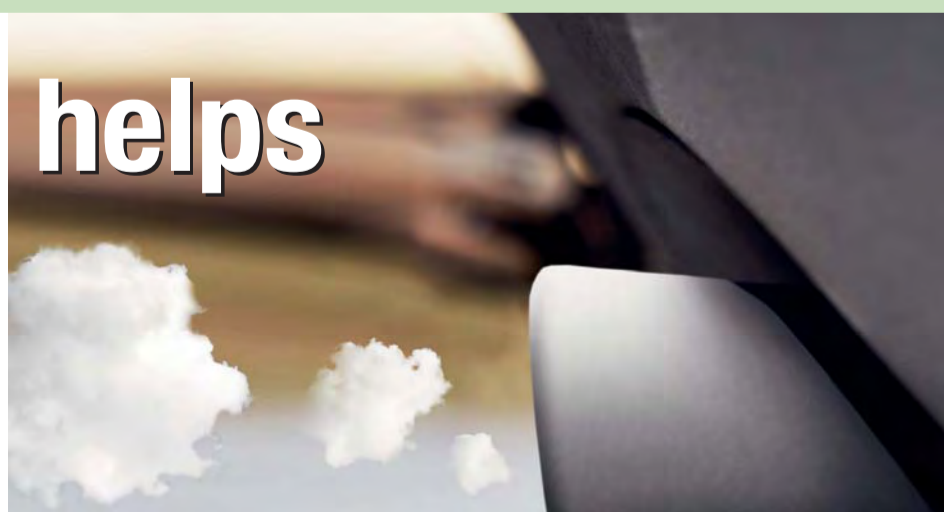
Belgian group **Umicore**, active since the 1960s in the design and production of ca-

talytic converters and a world player in materials technology, bolstered its precious metals department in 2007 when it took over the catalytic converter business of American company Delphi. In so doing, it

became the world leader in catalytic converters for the automotive industry. The catalytic converter helps reduce emissions from vehicles using precious metals (platinum, rhodium, palladium) and the chemical

reactions they promote. During normal operation, a catalytic converter breaks down 95% of polluting gases. Umicore is looking to expand on the rapidly growing global market in catalytic converters for trucks.

“The years ahead will see the systematic implementation of legislation and regulations on emissions from trucks. And it will probably be made more stringent on a regular basis. This requires increasingly com-



► *plex exhaust systems with high-performance catalytic converters. Just as it does for cars, Umicore will supply precious-metal-coated ceramic exhaust system components for trucks*", says **Marc Van Sande**, Chief Technology Officer at Umicore. "We have a major lead over the rest of the world in this technology."

Technology-driven company **Bekaert** is also contributing to cleaner cars. The particle filters for diesel engines developed by the company are thin metal fibres used to purify liquids and gases.

🌐 www.umicore.com
www.bekaert.com

"Improving air quality is crucial when it comes to sustainably managing our planet"

Zero-emission hybrid bus: world first

Belgian bus maker Van Hool is a leader in the development of hybrid buses and produces both 'hybrid fuel cell buses' and 'hybrid diesel electric buses'. The former are powered by fuel cells, which emit no pollutants (only water vapour), while the latter are powered by a diesel generator. Van Hool's fuel cell buses are already on the road in the United States (5 units) and Belgium. The European version has been road tested in Belgium, Spain, the Netherlands and Germany. "Another 16 fuel cell buses are in production for the United States (California and Connecticut)", says a Van Hool executive.

The bus can travel the same distance and transport as many passengers as a diesel bus, but consumes less energy, emits no harmful gases and drives very quietly. The only thing this bus emits is a steam cloud!

"To develop this kind of advanced technology you need a small army of researchers and a very determined management team, because this is truly a gamble on the future! We believe that these kinds of vehicles will enjoy massive success within 10 or 15 years due to rising pressure on energy prices and the commercial development of fuel cells."

🌐 www.vanhool.com

Advanced fuel cells with Belgian know-how

According to experts, it is impossible to imagine the energy landscape of the future without the fuel cell. The first commercial applications in portable devices (computers, camcorders and even mobile phones) may not be all that far away. Mass production in transport and stationary installations (cogeneration, for example) will follow. Membrane electrodes are at the heart of the fuel cell. Thanks to the expertise of its two Belgian parent companies, materials specialist **Umicore** and chemicals giant **Solvay** (with its special polymers), **SolviCore** is positioned as one of the few global players that can manufacture these key components. "We are an excellent example of a small innovative company with a European dimension", says **Holger Dziallas**, CEO of SolviCore. "If fuel cells become a commercial reality tomorrow, then we are talking about potential sales worth billions of euro globally."

Hydrogenics (European office based in Belgium) offers world-class expertise for a range of applications, including hydrogen fuel cells for electric vehicles.

🌐 www.solvicore.umicore.com
www.hydrogenics.com

Industrial installations with pure air

In addition to the transport sector, many

Belgian companies offer green solutions for industrial air purification. **The Sniffers** is a high-tech company specialising in measuring and controlling emissions, flue gas measurements and pipeline inspection services. The company is one of the market leaders in this area and provides services to various sectors, including pharmaceuticals, petrochemicals, the automotive industry, refineries and drilling rigs.

The filters, scrubbers, thermal and electrostatic systems made by **Hamon** are efficient in dealing with pollution in substances such as fly ash, nitrates, ammonia and sulphates. With more than 100 years of experience in air purification, this Belgian company has developed, built and maintained many air purification systems. In 1997 it took over an American company in the same industry, Research-Cottrell, and is active in Europe, North America, Asia and Africa. One major player in air purification via active carbon filters is **Desotec**. Desotec's typical applications include solvent and hydrocarbon removal, odour removal, purification of air from air conditioning and cooker hoods, and flue gas treatment. In addition, many other Belgian companies such as **Keppel-Seghers, Fabricom, Alstom, A.A.F., Delta Neu Benelux, Donaldson, KH Engineering, KIMRE (Belgian Benvitec Group)** and **Waterleau** produce efficient products and technologies for air purification.

🌐 www.the-sniffers.be
www.hamon.com
www.desotec.com
www.fabricom-gti.com
www.alstom.be
www.aafeurope.com
www.delta-neu.com
www.donaldson.com
www.waterleau.com
www.kh-engineering.nl
www.group-benvitec.be

Technology of the purest water

The significant rise in the world's population is putting increasing pressure on the earth's supplies of fresh water, while production of wastewater is rising, resulting in a higher risk of pollution. In Europe, water supply and wastewater treatment are the main environmental sectors, after waste management and recycling. Some Belgian solutions are perfectly adaptable to the situation in regions around the world and in all kinds of companies and industries.



"The limited water supply in some regions requires dynamic management of this essential source of life. The technologies developed in Belgium can contribute to the launch of projects for water treatment and purification, which can help enhance the quality of life of residents and improve the quality of wastewater", says **Rudi Thomaes**, CEO of the Federation of Enterprises in Belgium (FEB).

One-stop shop for the treatment of water, sludge and biomass

Waterleau is involved in treating drinking water, wastewater and sludge for both municipal and industrial customers, as well as biomass (green waste) and waste with the potential for recovering biogas or producing renewable energy. "We are one of the few in the world fully capable



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www.confederatiebouw.be - www.confederationconstruction.be

of handling end-to-end projects, based on our own advanced technology as the core of the solution", reports Vice-President Sales & Marketing **Willy Gils**. In the environmental sector technology is highly sought after right now. Regarding the anaerobic treatment of wastewater, Waterleau is among the top three in the world, with more than 250 satisfied customers. But Waterleau is also strong in applying technology, such as using the latest membranes in bioreactors. This Belgian company is continuously refining its technology.

Waterleau also provides turnkey solutions for air purification and the production of renewable energy. "Thanks to our industrial approach and our know-how in a number of naturally related areas such as water, air and waste treatment, we are increasingly involved in setting up integrated projects that have an impact on energy production. An economic ap-

"Belgian solutions are perfectly adaptable to the situation in regions around the world and in all kinds of companies and industries"

proach and environmental input are very closely intertwined", explains Gils. In less than ten year's time, Waterleau has grown into a world player in the environmental sector, with offices in Europe, Asia, America and the Middle East and over 1,500 references globally.

www.waterleau.com

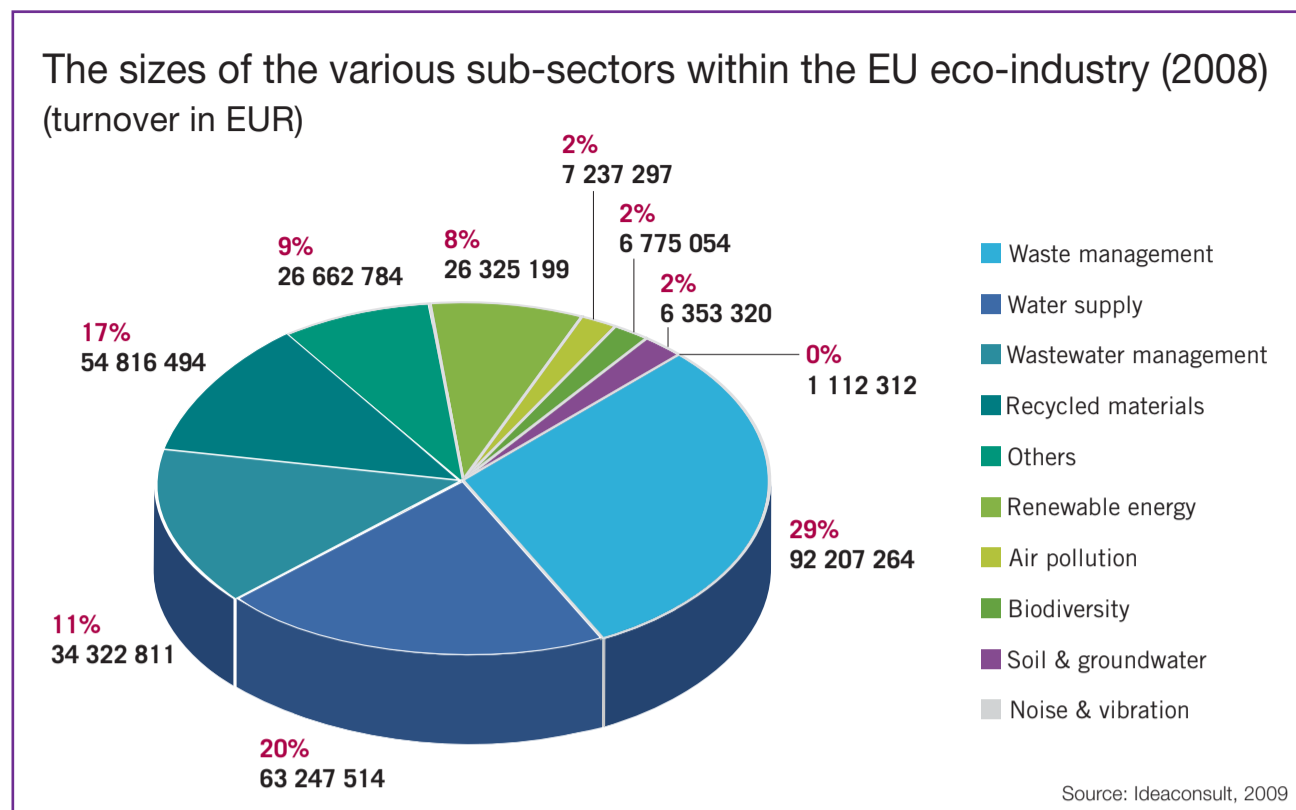
Belgians win international award for water treatment plants

BESIX Sanotec (in partnership with OTV from the Veolia Group) and **Six Construct** won a BOOT (Build, Own, Operate and Transfer) contract from the Emirate of Abu Dhabi to design, build and operate two new wastewater treatment plants (Wathba and Allahama) with a capacity of 300,000 m³/day and 130,000 m³/day respectively. BESIX is a co-investor in the concession. The civil works will be carried out by BESIX and Six Construct, and the electromechanical installations handled by BESIX Sanotec (as part of a joint venture with OTV from the VEOLIA group). For this project, the two companies won the highly coveted 'Water Deal of the Year' at the GWI Global Water Awards 2009. These are the most prestigious recognitions awarded to international water treatment and purification projects. Upon completion of construction, BESIX will have half a 33% participation in the operation and maintenance of the plants for a period of 22,5 years.

www.besixsanotec.be
www.sixconstruct.com

Online water analyses and other measuring technology

During the wastewater treatment process, close monitoring of water composition can often be very useful. Belgian company **AppliTek** is currently commissioning a network of 10 measurement stations that will monitor the wastewater produced by plants at a large chemical complex in Saudi Arabia. AppliTek's CEO **David Laurier** explains how its method differs from traditional laboratory measurements: "Our equipment allows us to check measurements at any time. The



market for on-line water analysis is expanding globally – which isn't surprising, since it offers a lot of advantages. Thanks to on-line monitoring, we can prevent biological processes associated with water treatment from going wrong. We can also monitor and compare the quality of natural water courses efficiently. In regions where water is scarce, our equipment can be used to monitor water reuse."

AppliTek specialises in the monitoring of biological water treatment processes and in continuous monitoring of wastewater or process liquids from (petro)chemical & oil/gas facilities. "We also have some major customers in the food sector", Laurier goes on. "We specialise in the

analysis, testing and monitoring of liquids, gases and air." In addition to its operations in Europe, AppliTek has notched up a successful track record in water and industrial process monitoring across the globe – in the Middle East (Egypt, Saudi Arabia, Kuwait and Qatar), the Americas and the APAC region (China, Thailand, Korea, Malaysia, India and Japan, Australia, etc.).

www.applitek.com

Massive water and sludge treatment contract

In 2008, **Keppel Seghers** signed a contract in Qatar to design, build and operate a water treatment plant with a daily volume of 439,000 m³ and a plant for the treatment of contaminated dredging sludge, worth a total of around € 710 million. Keppel Seghers is a global player in the field of water treatment plants and waste incinerators. "Recently we have been focusing mainly on water reuse, for which we are developing a new technology. One of our biggest projects involves desalination of seawater in an economically viable way using membrane technology combined with distillation", explains **Luc De Ryck**, Senior General Manager of Keppel Seghers Belgium - offering yet another example of cutting-edge technology under development. Keppel Seghers Belgium was formed following the takeover of Belgian company Seghers Better Technology by Keppel Corporation, one of the biggest listed companies in Singapore. **Air Liquide Belux, Veolia, Waterleau and BWT** are other Belgian companies active in this sector.

www.keppelseghers.com
www.airliquide.be
www.veolia-es.be
www.bwt.be
www.waterleau.com

Whole treatment plants and components supplied by Belgian companies

Metal-processing company **Vandezande** is another world leader when it comes to cutting-edge water treatment technology. It supplies mechanical parts for treatment plants and pumping stations around the globe. The company is best known for its 'screw pumps' – giant corkscrews used to pump water – which it designs and manufactures in-house.

More Belgian expertise in water treatment can be found in various branches of **SUEZ Environment**, part of the **SUEZ Group**, whose main Belgian specialists are **Ondeo Industrial Solutions, Degremont Benelux** and technical firm **Fabricom**. "Fabricom's Environment Department focuses mainly on electromechanical and engineering equipment for water treatment plants as well as the denitrification of drinking water. We also provide electromechanical equipment used in water production plants and pumping stations and install remote monitoring systems for pumping stations, water treatment plants and water towers", explains division manager **Mark Dirckx**.

www.vandezande.com
www.suez-environment.com
www.fabricom-gti.com

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Re-use



Air



Waste

Biomass

Renewable Energy



WATERLEAU - Radioweg 18 B-3020 HERENT (Leuven), Belgium

www.waterleau.com
info@waterleau.com

ECOLOGICAL CLEANING, WITHOUT DETERGENTS

Belgian company **Realco** has discovered that enzymes make a more environmentally friendly cleaning agent than traditional detergents. The enzyme is a natural organism (protein) with excellent cleaning properties: thanks to the thorough and irreversible action of its organic material, Realco's products achieve a high level of cleaning performance whilst also benefiting the environment. Realco uses enzymes as a full or partial substitute for chemical detergents. As well as working preventively, the enzymes can also be used correctively by suppressing the inhibitor effect of some detergents on biological purification processes. "Our concept, which is protected by a number of patents, makes cleaning an integral part of the purification process", Realco explains. "We work with both industrial clients in the food and hospitality sectors as well as private customers." Partnerships between its R&D Department and universities and research centres mean that Realco can regularly market innovative new products.

www.realco.be



Leading the way in soil remediation



In the 32 member countries of the European Environment Agency (EEA) alone, there are around 250,000 polluted sites registered as requiring urgent remediation. According to the EEA, this number could increase by 50% between now and 2015. Faced with a challenge on this scale, European industry is having to innovate like never before, producing new technology that has the potential to benefit the whole world. Belgium can lay claim to several such innovations.

Unique in-situ thermal treatment

Brussels-based company **Deep Green** has developed a revolutionary technique that allows soil to be treated without being dug up and displaced – a major advantage in

built-up areas. The Thermopile© technology, which uses heat treatment to isolate polluted soil particles, is a high-tech form of soil remediation for heavily contaminated soils such as those containing large concentrations of hydrocarbons, PAHs or

PCBs. The technique is thought to be the only one of its kind in Europe. “The Thermopile© technology, which is covered by an international patent, cuts direct energy and manpower costs, saves a lot of time and reduces noise and dust nuisance in the

immediate vicinity. What counts most, of course, is the end result: a complete absence of organic pollution following the treatment”, explains Deep Green’s CEO **Jan Haemers**. Among other places, the technology has been used on an embassy renovation project in central Brussels. Deep Green has its own treatment facilities in Belgium, France, the Netherlands and Spain. Until now it has confined its activities to Europe, but it is beginning to break into international markets thanks to licence agreements. A network of licence holders is gradually developing, primarily in the Gulf states.

www.deep-green.com

Industrial dredgers who are also soil specialists

Belgian dredging companies have carved out an international reputation. Both **DEME (Dredging International division)** and **Jan De Nul** have won contracts all over the world to dredge lakes, canals and rivers (in the Panama Canal, for example) and redevelop ports and harbours (as in Dubai). Their expertise now also extends to soil remediation. **DEC**, part of the world renowned dredging group DEME, specialises in soil, groundwater and sediment treatment, soil remediation, hydraulic engineering, recycling techniques, capping and remediation of landfills and redevelopment of brownfields. Its clients include companies in the petroleum industry, mining, quarrying and metallurgy, as well as government agencies, general contracting companies, consultants, project developers and waste-processing companies worldwide. Another soil specialist with links to dredging is **Envisan**, part of the Jan De Nul Group. Jan De Nul operates globally in the dredging, civil engineering and environment sectors. Envisan performs groundwater remediation, decontamination of polluted soil and landfills and dredged sludge treatment. It can operate either in situ or at its own independent soil recycling centres. Envisan

also offers complete concepts for the construction and management of landfills, lagoons and other watertight sites. It can dewater, treat and immobilise dredged sludge, or turn it into recyclable material.

www.deme.be
www.jandenu.be
www.envisan.be
www.decnv.com

Belgian soil technology: a broad spectrum

Evidence of Belgian expertise in contaminated soil treatment can also be found in companies like **TPF Basse-Sambre** and **CMI Nesa**. TPF Basse-Sambre, which belongs to Belgian group TPF SA, specialises in the design, study and implementation of industrial processing procedures for

“European industry is having to innovate like never before, producing new technology that has the potential to benefit the whole world”

solid waste and soil material using technologies such as biometanisation, combustion and pyrolysis. CMI Nesa focuses on thermal treatment of polluted soil, sludge and organic waste, while **Danheux & Maroye** rehabilitates polluted sites using a variety of in-situ techniques such as bubbling, bioventilation and groundwater pumping. Its ex-situ techniques include biodegradation, encapsulation and oxidation of contaminants.

www.cmigroupe.com/nesa
www.tpfgroup.com
www.danheux-maroye.be

Globally, humans produce around 18 billion tonnes of waste a year. Of this, 10% – equivalent to 3.5 tonnes per person – is generated in Europe. In the war on waste, Europe is now the pioneer and front-runner when it comes to sorting and recycling. Within this broad field, a number of Belgian companies boast technology and expertise that is utilised around the world, encompassing not only collection and sorting but also waste recovery. But some companies are going even further, trying to prevent waste by re-designing their products and processes. The waste from one process can become the raw material for another process. For waste today is an increasingly expensive commodity and one with an undoubted economic value.

“The impact of steadily rising household, agricultural and industrial waste production on human health and the environment requires constant vigilance. In some sense, this is the downside of economic development: the more we produce, the more we consume and the more waste we generate. Every country faces huge challenges in this area, but some technological solutions originating in Europe – and Belgium in particular – are well worth exporting”, explains **Rudi Thomaes**, CEO of the Federation of Enterprises in Belgium (FEB). “The key challenge is to give waste an economic value and not to consider it as ‘waste’. Sustainable development of this kind allows us to reconcile economic growth with environmental protection and well-being.”

Industrial production processes often generate wet or dry residual matter. This is usually sent to landfill or simply burnt. However, a number of Belgian companies have developed innovative ways of recovering such waste materials and putting them to effective use. The ultimate aim is to close every material cycle.

Waste is no longer ‘waste’

Preventing waste through intelligent design

More and more businesses are trying to prevent waste by closing material cycles. In this approach, waste is reclaimed by nature or used as the raw material in a new process. During the design phase, attention is paid to the composition of the product. The eco-designer analyses the reusability and biodegradability, or designs his product in such a way that simple dismantling enables total recycling.

Roltex, a small company with 25 staff, manufactures serving trays for professional use (in fast food chains or motorway restaurants, for example). One of their products, the Earth Tray, is made out of renewable materials, such as resins made from the residue of compressed sugar beet and FSC wood. Ultimately, Roltex wants to join forces with fast food chains to set up a system in which end-of-life serving trays are returned to the factory for ecological processing.

www.roltex.be

Desso, a Belgian-Dutch manufacturer of carpets and artificial grass, has been a staunch supporter of the cradle-to-cradle approach since 2008. This pioneering philosophy strives to create endless cycles of biological and technical raw materials. Desso shares this conviction and aims to design innovative products which, in addition to their functionality, design and comfort, also contribute to a healthy living environment. “Our philosophy assumes a product design focused on creating products that are biodegradable, or which can be re-used in full as the raw material for new products”, says

Dr Pierre van Trimpont, CEO of Desso NV. These products are made via socially responsible production processes which use sustainable energy and which are economic with water. Desso also introduced a return system in which the company collects its customers’ used carpets and recycles them into new materials used in carpet production. Desso wants to produce all of its carpets and artificial grass according to this principle by 2020.

www.desso.com

Compostable textile products

Textile company **DS Textile Platform** launched environmentally friendly coloured polyester fibres back in the 1980s. It has been making fibres from recycled PET bottles since 2003 and is currently leading the way on biodegradable carpets, which are used mainly at trade fairs and other short events. The company’s innovation also extends to agriculture. It uses biopolymers derived from agricultural crops to create biodegradable products that protect against weeds, erosion and similar problems. The products can be composted after use. The manufacturing process emits 80% less CO₂ than the manufacture of traditional alternatives. **Patrick De Saedeleir**, CEO of DS Textile Platform, notes: “The industry mostly uses petrochemical materials. These will eventually run out, whereas we are already tapping alternative sources.”

www.dstextileplatform.com

Preventing waste through chain thinking

Family-owned weaving mill **Jules Clarysse**



manufactures bath and kitchen textiles. The company produces 100,000 towels per day, which are exported to more than 30 countries. As the European market leader in bath towels, Jules Clarysse is thinking ahead. For instance, it is exploring the pro-

duction of soy-based towels. CEO **Peter Bauwens** explains: “The towels are made from a combination of organic cotton and soy fibres, a by-product of the soy yoghurt production process. The soy fibres make the towels softer, more absorbent and fas-

► *ter-drying.* The towels are already on sale on a small scale. But Jules Clarysse wants to make the general public aware of the towels as quickly as possible. In addition to towels made from soy fibres and organic cotton, the company also recycles a lot of waste. Accordingly, a project was launched to collect old towels from consumers via large stores and to use the cotton waste to make new towels. This is an example of chain thinking.

🌐 www.claryssejules.be

Endless re-use of building materials

Building waste is often used as a foundation material for roads. Under pressure from European legislation, building waste is increasingly being used as a secondary raw material for new building materials. As one of the first producers of building materials, **Gyproc** has successfully closed its materials cycle, moving from raw material to building material and back to raw material. "Thanks to the Gyproc Recycling programme we can recycle old sheets of plasterboard into plaster that can then be reused in the manufacture of new plasterboard. For this, we use three kinds of plaster waste: industrial production waste, waste from worksites and cutting operations, and waste from demolition operations at the end of the lifecycle", explains **Luc Plancke**, Sustainability Manager Gyproc. Due to advanced recycling technology all plaster building materials that end up as waste can be reprocessed into a primary raw material. This process can be repeated indefinitely, making it unique.

🌐 www.gyproc.be

Ceramic building waste as high-value raw material

Wienerberger also wants to set up a system capable of filtering waste, in this case ceramic mass from worksite waste. "We will be the first in the world to separate out the red ceramic fraction from the grey concrete fraction using an optical technology that we developed ourselves", explains **Dr Anita Ory**, Environmental Manager Wienerberger Belgium. Once it is ground down, the ceramic mass can be reused as a raw material for building materials like bricks and roof tiles. The company is looking for the perfect sorting method. In addition, it wants to look into how the ceramic mass can best be ground and how the mass can be used as a raw material for new products. Anita Ory explains that "the re-use of broken ceramic waste not only will result in savings of primary raw materials, but also a reduction in emissions and primary energy use since the material has already been fired."

🌐 www.wienerberger.com

Customised waste processing

The fact that Belgium is a leader in waste processing also means that some companies specialise in the sustainable management and processing of very specific forms of waste. For instance, **Indaver** offers industrial companies and public authorities high-quality, integrated waste management solutions. "For each type of waste we offer a customised solution via our wide range of facilities and using the best available technologies. The emphasis is on recovering energy and materials", says **Ronny Ansoms**, CEO Indaver. While Indaver is firmly rooted in its home country, it has grown into an international group with sites across Europe. Today, Indaver is Europe's second largest player in hazardous waste incineration. The group has a turnover of € 400 million and 1,400 employees.

In many countries, a significant proportion

BELGIUM - NO.1 IN EUROPE FOR WASTE PROCESSING AND RECYCLING THANKS TO EXCELLENT ORGANISATION

Efficient waste processing is only possible through the proper organisation of sorting and collection. In Belgium, a number of organisations set up by economic interest groups are overseeing successful waste sorting and recycling. This is coupled with awareness-raising campaigns targeting the general public and specific stakeholder groups. **Fost Plus** focuses on household packaging, **VAL-I-PAC** on industrial packaging and **Recupel** on electric and electronic equipment. Their efforts have not been in vain, since according to European Commission figures Belgium has the highest household packaging recycling rate in the European Union (93% in 2008). Its recycling waste for industrial packaging waste was 78.4% in 2008.

🌐 www.fostplus.be - www.valipac.be - www.recupel.be



of electricity is generated by nuclear power. Radioactivity also plays an important role in health care and in industrial and scientific applications. All these activities produce a residual quantity of radioactive waste material requiring special handling. In Belgium, which opted for the centralised processing and management of its radioactive waste, **Belgoprocess** is responsible for this task. "Belgoprocess has extensive knowledge of and the best available technologies and facilities for the processing, conditioning and storage of radioactive waste and for the dismantling of obsolete nuclear installations", explains **Walter Bogaerts**, CEO Belgoprocess. "We focus on minimising the amount of radioactive waste produced and on stabilising and encapsulating the radioactive waste. Belgoprocess is also increasingly focusing on deploying its expertise abroad, as illustrated by the growing number of international contracts Belgoprocess is winning", says Bogaerts.

🌐 www.indaver.com
www.belgoprocess.be

Belgian companies can help you with recycling of specific types of waste

Recent studies have confirmed that recycling not only saves precious resources such as metals and forests but also cuts greenhouse gas emissions since it requires less energy than manufacturing with raw materials.

Belgian group **Umicore** is world leader in the recycling of precious and special metals. Most of the raw materials it uses to produce metals and for associated applications are derived from secondary sources, mainly industrial by-products and used materials. Metal recycling is increasingly widespread due to legal and regulatory obligations in Europe (and soon worldwide), which require old equipment to be recycled. "Only 15% is being recycled at the moment, but that should eventually rise to 100%", explains Umicore's Chief Technology Officer **Marc Van Sande**. Technologically, Umicore is well ahead of the rest of the world in this area. "We use a highly efficient melting process that recovers a lot of metal and processes the waste into a reusable form extremely quickly." He anticipates a sharp increase in demand for noble metals for use in such applications as catalytic converters (platinum, palladium, rhodium, etc.) and fuel cells (platinum or gold).

Many other Belgian firms can boast recognised waste expertise, ranging from collection and contaminated soil treatment to composting, recycling and biomethane generation. **Recyfuel**, for example, produces solid fuels from hazardous waste for use in cement plants, while **WOS Hautrage** and its subsidiary **WOS Genk (Revatech Group)** specialise in processing liquid and solid hydrocarbon waste, which they use to produce petroleum fractions such as base oils, heating gas oil, heavy fuel oil and bitumen.

🌐 www.recyfuel.be
www.revatech.be
www.umicore.com

Energy recovery from waste with limited running costs

CMI Nesa has its own original pyrolysis process which is still going strong after 30 years. "This process offers a lot of advantages, not only operationally (very limited maintenance) but also environmentally since it optimises energy recovery and heavily reduces smoke particulate emissions", explains a representative of CMI Nesa. A business unit of Belgian group CMI – well known in the Middle East for its heat-recovery boilers –, CMI Nesa has more than 20 environmental references in Europe. The pyrolysis technique makes it possible to treat all types of sludge as well as some iron and steel by-products, used tyres, grinding residue from car recycling, poultry manure and even fluff (a light fraction derived from the sorting of household waste). "The ideal scenario is to combine a wastewater treatment plant with an industrial unit such as a cement plant. The thermal recovery then becomes self-sustaining", explains the CMI Nesa representative. "The sludge is reused, iron is brought in to produce cement clinkers and pyrolysis gases are used as additional fuel." CMI Nesa boasts around 200 international references in Europe, the United States and the Middle East. Other Belgian specialists who recover energy from waste are **Keppel-Seghers, Wa-**

terleau, Fabricom, Vyncke, Clayton and KH Engineering.

🌐 www.cmigroupe.com/nesa
www.keppelseghers.com
www.waterleau.com
www.fabricom-gti.com
www.vyncke.be
www.clayton.be
www.kh-engineering.nl

Belgian pyrolysis harnesses potential of burnt waste

Solid waste and ores can be converted into electrical energy using pyrolysis, a form of high-temperature combustion. The technology, which has already been put to effective use in the oil, gas and cement sector, was developed by **TPF Basse-Sambre**, a subsidiary of Belgian consultancy group TPF. The firm sold the patent to SUEZ-subsiary Sita but retained the sale rights. "This technique makes it possible to manage the whole thermal-destruction process and precisely control nitrogen oxide emissions", explains managing director **Jean-Pierre Polet**. The technology allows all types of waste to be processed without preparation, from hydrocarbon residues, plastic packaging, old tyres, cardboard and paper through to hospital and industrial waste. After the 'useful combustion', all that re-

mains is ash. The first plant to exploit this innovative process was built in Keflavik, Iceland, and has an annual waste treatment capacity of 15,000 tonnes. "The unit has been operating for four years, with an operating availability above 96% and uninterrupted working period not less than nine months. The results of this pioneering enterprise speak for themselves", Polet notes. TPF Basse-Sambre has also developed expertise in the field of waste preparation with a technique for separating car-shredding residues. As an industrial installer, TPF Basse-Sambre can handle every phase of an

"The key challenge is to give waste an economic value"

industrial project from the feasibility study right through to final plant acceptance. The company has worked in a range of countries including Yemen, Qatar, Oman, Jordan, Algeria, Tunisia and Morocco.

🌐 www.bseri.com
www.tpfgroup.com

BELGIAN SECTORAL ORGANISATIONS AT YOUR SERVICE

As well as FEB, you can contact its sectoral organisations at any time to find out more about a specific sector. Here you will find an overview of all FEB sectoral organisations together with their contact details.

AIR TRANSPORT

Belgian Air Transport Association - BATA
Tel + 32 2 640 00 34
www.bata.aero

BANKING, STOCK EXCHANGE, CREDIT AND INVESTMENT
The Belgian Financial Sector Federation - FEBELFIN
Tel + 32 2 507 68 11
www.febelfin.be

BRICK INDUSTRY

Belgian Brick Industry Federation - FBB/BBF
Tel + 32 2 511 25 81
www.brique.be

CAR AND TWO-WHEELER INDUSTRIES

The Belgian Federation of the Car and Two-wheeler Industries - FEBIAC
Tel + 32 2 778 64 00
www.febiac.be

CEMENT

Federation of the Belgian Cement Industry - FEBELCEM
Tel + 32 2 645 52 11
www.febelcem.be

CHEMISTRY AND LIFE SCIENCES

Belgian Federation for Chemistry and Life Sciences Industries - essenscia
Tel + 32 2 238 97 11
www.essenscia.be

CLEANING

General Union of the Belgian Cleaning Sector - UGBN/ABSU
Tel + 32 2 732 13 42
www.absugbn.be

CLOTHING

Creamoda
Tel + 32 2 238 10 11
www.creamoda.be

CONCRETE

Belgian Precast Concrete Federation - FEBE
Tel + 32 2 735 80 15
www.febe.be

CONSTRUCTION

Construction Confederation
Tel + 32 2 545 56 00
www.confederationconstruction.be

DISTRIBUTION

Belgian Federation of Distributors - FEDIS
Tel + 32 2 788 05 00
www.fedis.be

ENERGY

Belgian Petroleum Federation - FPB/BPF
Tel + 32 2 508 30 00
www.petrofed.be

Federation of Belgian Electricity and Gaz Companies - FEBEG
Tel + 32 2 500 85 85
www.febeg.be

Federation of the Electricity and Gas Networks Operators in Belgium - SYNERGRID
Tel + 32 2 237 11 11
www.synergriid.be

ENGINEERS

Association of Consulting Engineers, Engineering- and Consultancy-bureaus - ORI
Tel + 32 2 706 05 70
www.ori.be

ENVIRONMENT

Federation of Waste Management & Environmental Industry
Tel + 32 2 757 91 70
www.febem-fege.be

FIBRE CEMENT

Professional Union of Belgian Fibre Cement Manufacturers
Tel + 32 3 760 49 31

FOOD

Food Industry Federation - FEVIA
Tel + 32 2 550 17 40
www.fevia.be

GLASS

Federation of the Glass Industry - FIV/WGI
Tel + 32 2 542 61 20
www.vgi-fiv.be

GRAPHICS INDUSTRY

Federation of the Belgian Graphics Industry - FEBELGRA
Tel + 32 2 512 36 38
www.febelgra.be

HUMAN CAPITAL

Federation of Partners for Work - FEDERGON
Tel + 32 2 203 38 03
www.federgon.be

INSURANCE

Belgian Insurance Association - Assuralia
Tel + 32 2 547 56 11
www.assuralia.be

Professional Union of Insurance Brokers - UPCA/BVVM
Tel + 32 3 217 54 60
www.upca.be

IRON AND STEEL

Iron and Steel Group - GSV
Tel + 32 2 509 14 11
www.steelbel.be

LIME, LIMESTONE, DOLOMITE AND ALLIED PRODUCTS

Federation of Extractive and Processing Industries for Non-Energetic Rocks - FEDIEX
Tel + 32 2 511 61 73
www.fediex.be

PAPER - MANUFACTURERS

Belgian Association of Pulp, Paper and Board Manufacturers - COBELPA
Tel + 32 2 646 64 50
www.cobelpa.be

PAPER - PROCESSING

Federation of Paper and Board Converting Industries - FETRA
Tel + 32 2 344 19 62
www.fetra.be

PORTS

Federation of Belgian Port Employers
Tel + 32 3 221 99 87

SAND PITS

Sand Pits Group
Tel + 32 3 232 66 11

SHIPOWNERS

Royal Belgian Shipowners' Association
Tel + 32 3 232 72 32
www.brsv.be

TECHNOLOGY INDUSTRY

Federation for the Technology Industry - AGORIA
Tel + 32 2 706 78 00
www.agoria.be

TEXTILES, WOOD AND FURNITURE INDUSTRIES

Belgian Federation of the Textile, Wood and Furniture Industries - FEDUSTRIA
Tel + 32 2 528 58 11
www.fedustria.be

TRANSPORT AND INTERNATIONAL TRADE

Federation of Employers in International Trade, Transport and Allied Sectors
Tel + 32 3 221 99 90
www.wf-fe.be