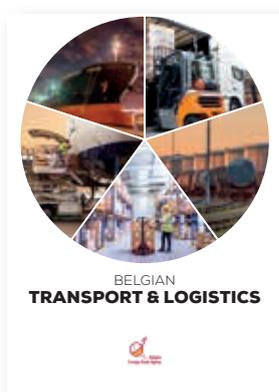
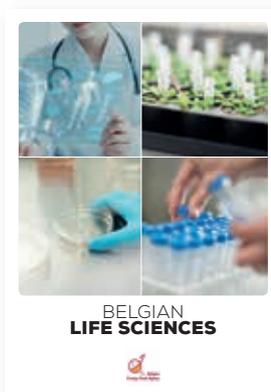
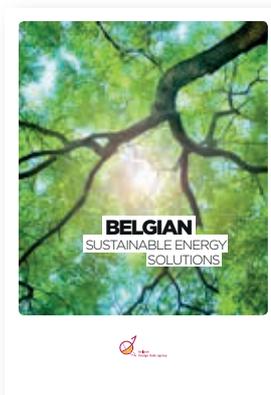
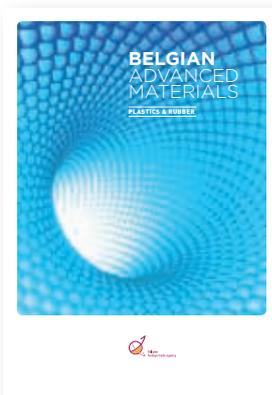




# BELGIAN **SUSTAINABLE BUILDING SOLUTIONS & SMART CITIES**



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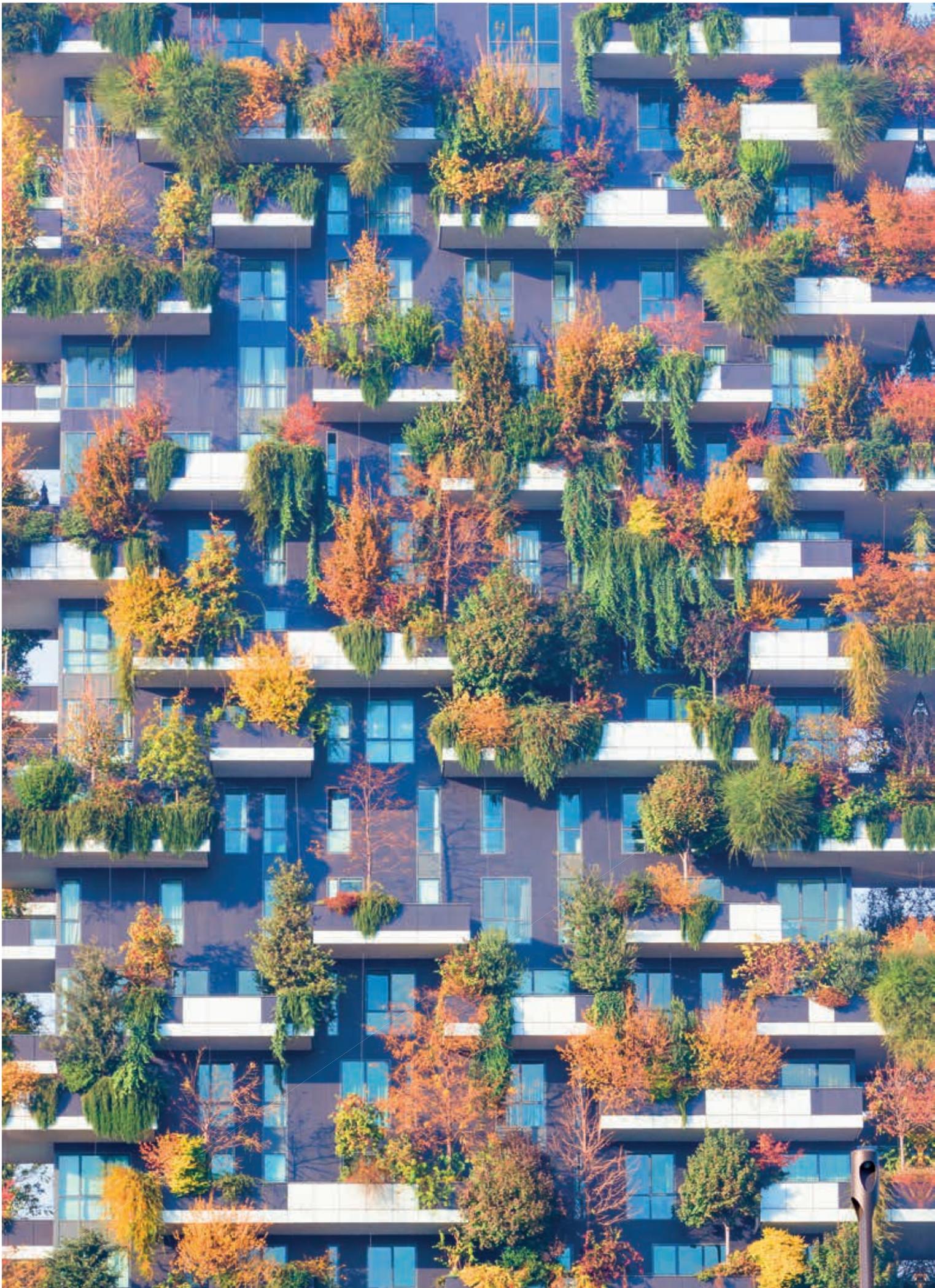
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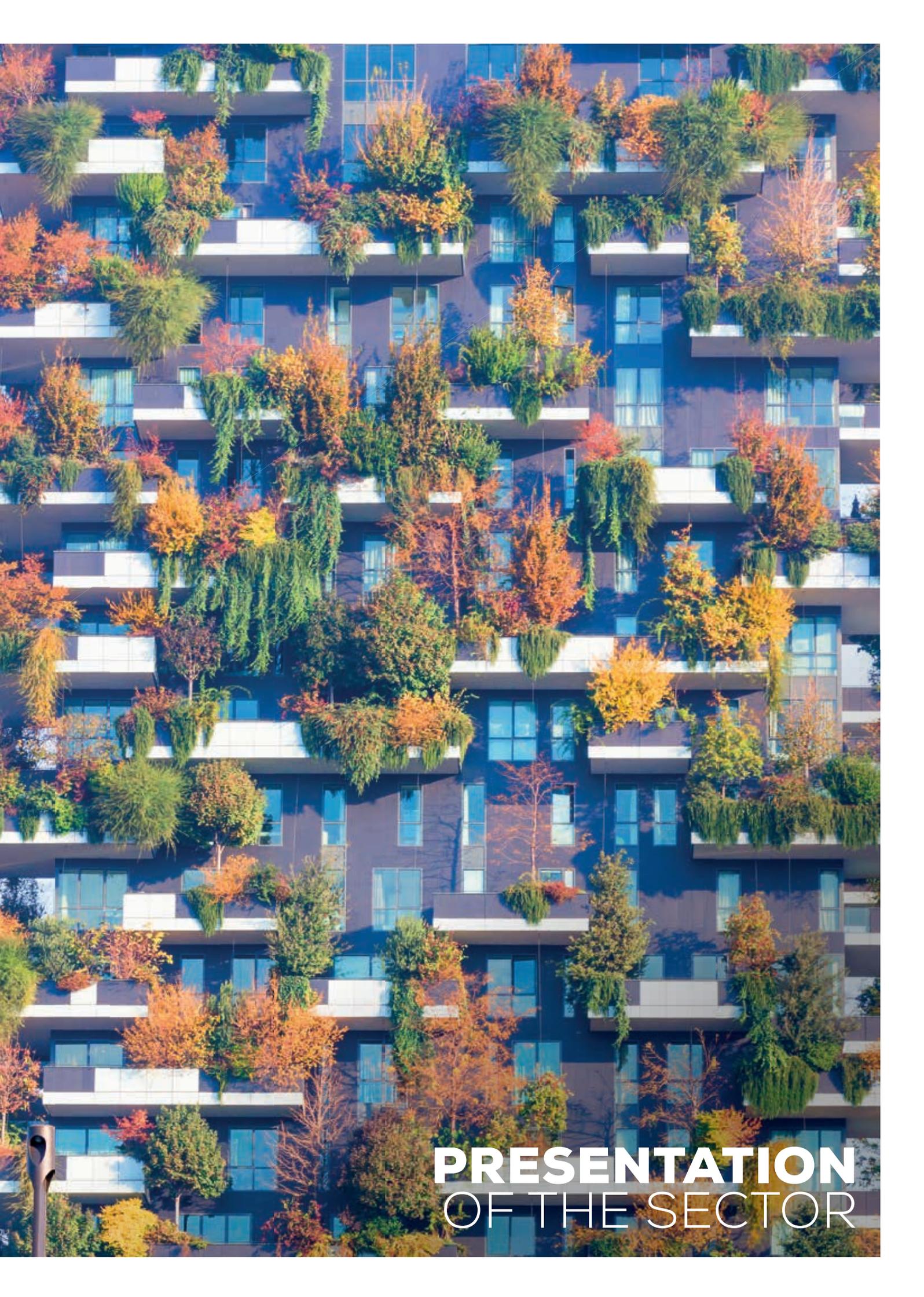
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The contents of the interviews were approved by the respective companies for use in this publication.

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# PRESENTATION OF THE SECTOR

SECTION 1.1

SUSTAINABLE BUILDING SOLUTIONS

1. Definition

Emerging in the wake of the oil crisis and the appearance of sick building syndrome, *ecoconstruction* or *sustainable building* comprises a global approach and the integration of the various challenges of sustainable development in the construction, management and renovation of a building.

On the basis of this definition, constructing or renovating a building in a sustainable manner entails finding the best balance between the following three dimensions:

- the ecological dimension;
- the social dimension;
- the economic dimension.

Sustainable building thus meets a triple objective. Indeed, in order to be considered sustainable according to this approach, buildings do not only have to be energy-efficient or built using natural or recycled materials; they must also have a healthy and comfortable indoor climate for their occupants and be safe and accessible. Finally, construction, maintenance and life cycle costs also play a significant role. This broad interpretation is illustrated in the following table:

Sustainable buildings and their main aspects according to the European project LEnSE

Environmental Aspects	Social Aspects	Economic Aspects
Climate Change: <ul style="list-style-type: none"> <li>• greenhouse gas</li> <li>• acidification</li> <li>• depletion of the ozone layer</li> </ul>	User Well-being: <ul style="list-style-type: none"> <li>• indoor climate and comfort</li> <li>• perception of space</li> <li>• health and ease of use</li> </ul>	Financing and Management: <ul style="list-style-type: none"> <li>• analysis of usage functions</li> <li>• risk analysis</li> </ul>
Biodiversity: <ul style="list-style-type: none"> <li>• pollution due to fertilizers</li> <li>• biodiversity conservation</li> </ul>	Accessibility: <ul style="list-style-type: none"> <li>• the building and its surroundings</li> <li>• public transport</li> <li>• sidewalks and bike paths</li> </ul>	Life Cycle Value: <ul style="list-style-type: none"> <li>• life cycle costs</li> <li>• value of the building and adaptability</li> <li>• ease of maintenance</li> </ul>
Raw Materials: <ul style="list-style-type: none"> <li>• origin and use of materials</li> <li>• waste prevention</li> <li>• water consumption</li> <li>• land and land use</li> </ul>	Social and Cultural Value: <ul style="list-style-type: none"> <li>• local employment and social measures</li> <li>• ethical purchasing policy</li> <li>• impact on the surrounding area</li> <li>• aesthetic quality of the building</li> </ul>	External Factors: <ul style="list-style-type: none"> <li>• use of locally manufactured products and services</li> <li>• image of the building</li> </ul>
Management of the environment and environmental risks	Safety of the building and its surroundings	

Source: European Commission: Methodology Development towards a Label for Environmental, Social and Economic Buildings (2007).

Moreover, it is impossible to talk about sustainable building today without including this concept in a circular economy approach that offers an alternative to the linear extract-make-use-dispose model. The circular economy aims to ensure the rational and intelligent management of resources – from raw materials and energy to water, air, land and soil, and biodiversity – to limit negative externalities (depletion of non-renewable resources, degradation of air quality, increased greenhouse gas emissions and other environmental nuisances) and develop short supply chains that benefit local businesses and workers.

From design, through the implementation phase in the urban fabric, to demolition, sustainable building is therefore a construction method aimed at circularity that promotes the use of natural materials in locally-sourced batches and with low environmental impact. Six natural material sectors can be distinguished in sustainable building:

- The **straw** sector, a co-product of the production of cereal seeds used for more than 100 years as a building material.
- The **wood** sector, one of the oldest materials used in construction, has been brought up to date since the early 2000s thanks to innovative techniques. Today, almost 10% of new construction projects and renovations in Belgium are made of wood using three different techniques (timber frame, post and beam and solid wood).
- The **hemp** sector, historically one of the most prized materials for a multitude of uses (rope, paper, oil, etc.) but abandoned during the industrial period. Today, it is regaining its status thanks to the many advantages linked to its cultivation. Not very demanding in terms of soil and climate, hemp can be grown anywhere in Belgium.
- The sheep's **wool** sector, a 100% natural and renewable material that can be used for the sound and/or thermal insulation of buildings.
- The **clay** sector, a building material with numerous qualities (moisture regulation, thermal regulation, ease of implementation) that can be used in different forms and application techniques.
- The most recent, the **grass** sector, an abundant and renewable resource that grows naturally without the need for ploughing or costly treatment, is used to build insulation and protect a building against fire, fungi and pests.

Opting for a building method based on natural materials

also has many advantages, the most significant of which are:

- **Thermal phase shift:** eco-materials have a much better thermal inertia, which prevents heat from entering the built environment in summer, but retains it in winter.
- **Humidity regulation:** eco-materials can absorb and release up to half their weight in water. In addition, because eco-materials are breathable, excess water vapor is automatically evacuated to the outside. This means that a house is maintained at the ideal humidity level.
- **Air quality:** natural materials do not contain chemical compounds and therefore do not release harmful substances into the indoor air.
- **Fire resistance:** eco-materials are highly resistant to fire and do not release toxic gases in the event of a fire.
- **Energy savings:** eco-materials are produced locally in short supply chain batches, which means that less energy is consumed in manufacturing and transporting the materials.
- **Economies:** in sustainable building, cost analysis must be studied over the long term. Indeed, an insulated house based on natural materials will achieve very good energy performance which, despite a possibly, but not necessarily higher initial investment, may prove to be more economical after only a few years. Moreover, undertaking a sustainable building approach offers a guarantee of local employment and know-how.

In the end, sustainable building is clearly not a sub-sector of the building industry, but rather an integral design within a sector in transition towards sustainability. As sustainable building is first and foremost a process, all building trades and activities are therefore potentially sustainable.

## 2. European legislative framework for the construction sector, moving towards improving the energy efficiency of buildings

Buildings play a central role in our daily lives: we spend a large part of our days in them, whether at home, at work or in our free time. However, the built environment, in its many forms – homes, workplaces, schools, hospitals, libraries and other public buildings – is the largest energy consumer in the EU and one of the largest sources of carbon dioxide emissions.

On a European scale, the construction sector produces 33.5% of waste and consumes 33% of natural resources, accounting for 40% of energy consumption, according to Eurostat. In addition, it produces 36% of CO<sub>2</sub> emissions and 16% of water consumption. This is why European policies are aimed at improving energy efficiency and reducing CO<sub>2</sub> emissions from buildings, in order to achieve the ambitious objective of carbon neutrality by 2050 which was set out in the European Green Deal.

The sustainable transition of the construction sector is indeed essential to achieve these energy and environmental objectives at the European level. At the same time, better quality, more energy-efficient buildings improve the quality of life of citizens while bringing additional benefits to the economy and society.

Renovation of existing buildings could therefore reduce the EU's total energy consumption by 5-6% and cut carbon dioxide emissions by about 5%. Yet, on average, less than 1% of European building stock is renovated each year (the rate varies between 0.4% and 1.2% depending on the Member State). The current rate of renovation would need to at least double to meet the EU's climate and energy targets.

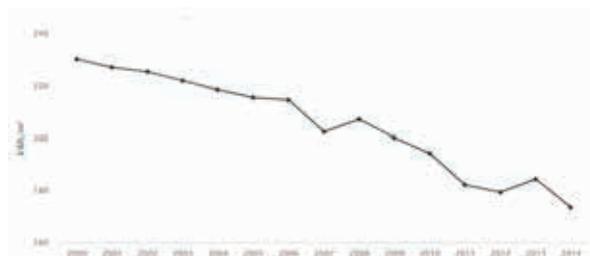
For this reason, the EU recently introduced ambitious new policies to help Member States improve the energy efficiency of buildings and facilitate access to finance to improve housing stock. In order to accelerate the transition to clean energy, Directive 2010/31/EU on the energy performance of buildings (or Energy Performance of Buildings Directive - EPBD) and Directive 2012/27/EU on energy efficiency were amended in 2018 by Directive 2018/844, whose key measures are as follows:

- EU countries need to establish long-term renovation strategies aimed at decarbonizing their housing stock by 2050;

- EU countries must set minimum energy performance requirements for new buildings, for existing buildings undergoing renovations and for the replacement or renewal of building components such as heating and cooling systems;
- All new buildings must be nearly zero-energy buildings (NZEB) as of December 31, 2020;
- Energy performance certificates must be issued when a building is sold or leased, and inspection programs for heating and cooling systems must be put in place;
- Building concept should take into account health and well-being (air quality and ventilation), electromobility (electric recharging points) and smart technologies (smart meters, self-regulating equipment and other digital tools) in new buildings;
- EU countries must draw up lists of national financial measures to improve the energy efficiency of buildings.

European directives on the energy performance and efficiency of buildings have already made environmental gains in reducing energy consumption, as demonstrated by the European Observatory of Built Heritage, a tool created in 2016 that lists the characteristics and energy performance of EU buildings. For example, as shown in the graph below, the energy efficiency of residential buildings across the EU has improved significantly since 2000.

**Energy consumption of residential per m<sup>2</sup> (normal climate) EU28**



Source: European Commission - EU Buildings Factsheets: Residential energy consumption at normal climate (all end-uses) (2014).

In addition, more energy-efficient buildings will inevitably result in lower energy bills and reduced energy demand. Finally, innovating and investing to develop more sustainable and intelligent buildings also stimulates the economy, in particular the construction sector, which generates around 9% of Europe's GDP and directly represents 18 million jobs.

## 3. Belgium, a success story in EPBD implementation

### 3.1 Ambitious energy performance requirements

In order to achieve the objectives of reducing CO<sub>2</sub> emissions, European Directive 2010/31/EU of May 19, 2010 on the Energy Performance of Buildings (EPBD) requires Member States to adopt energy requirements for the construction and renovation of buildings.

In Belgium, the implementation of the directive is the responsibility of the regional governments (Brussels-Capital Region, Flemish Region and Walloon Region), each of which has its own strategy for the long-term renovation of its real estate portfolio. In this way, within each region, building requirements have been strengthened, particularly by adopting ambitious energy performance standards for new constructions.

As a result, the requirements will be tightened for new buildings in Wallonia and Flanders beginning on January 1, 2021. Indeed, from 2021, all new buildings will have to meet the NZEB standard (Nearly Zero-Energy Building), which will benefit the many Belgian frontrunner companies supporting the regional NZEB action plans.

For its part, the Brussels-Capital Region set up even more ambitious “nearly zero or very low energy consumption” energy standards for new constructions inspired by **passive house** standards as early as 2015. As a matter of fact, when the Brussels-Capital Region adopted the passive house standard as the building code in 2015, it was the first region in the world to require such a stringent standard. Recognized then as a leading example regarding high-performance building standards, Brussels representatives were invited to New York to share best practices on sustainable building.

#### What is a passive house?

A passive building consumes an average of four times less energy than a conventional building. Moreover, it is also much more comfortable for its occupants because the ambient air is continuously renewed and filtered, which makes the air quality much better than that of a traditional home. The triple glazing guarantees acoustic comfort and the careful choice of window placement ensures a significant amount of daylight and visual comfort in every room.

For more information: [www.maisonpassive.be](http://www.maisonpassive.be) or [www.pixii.be](http://www.pixii.be)

#### Passive House Regions with Renewable Energies (PassREg) project

This project aimed to help accelerate the implementation of Nearly Zero-Energy Buildings throughout the EU, using Passive House with renewable energy sources. Several European municipalities and regions had already committed to energy-efficient Passive House principles, paving the way for other EU regions to achieve the European energy targets.

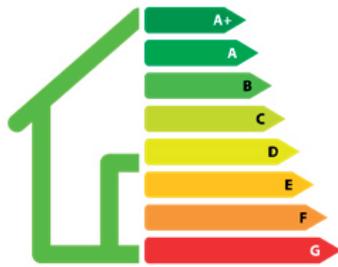
Having anticipated the EU directives for low energy construction by six years, the Brussels Capital Region is a leading Passive House region. As a matter of fact, the Passive House Standard became a compulsory norm in the Brussels-Capital Region back in 2015. As indicated in the PassREg final report, the sustained commitment of the Brussels authorities at the initial stages of the process is a key factor in the Brussels model.

The active involvement of policy makers was also quintessential in Antwerp, another Belgian frontrunner city. With the ultimate objective of becoming a CO<sub>2</sub>-neutral city by 2050, the trend towards Passive House buildings and use of renewables increased due to local policy decisions made by the city.

Frontrunner cities such as Brussels and Antwerp that have already implemented successful, cost-effective strategies therefore provide concrete best practice case studies for other European countries.

For more information: [www.passreg.eu](http://www.passreg.eu)

## 3.2 EPB Certification (required by law)



In Belgium, a flagship measure to address the current energy challenge has been the adoption of a mandatory EPB (Energy Performance of Buildings) certification system in all three regions. Although their application may differ from one region to another, the regional EPB regulations pursue the same objective and take into account the energy performance of a building in a comprehensive manner and according to a defined calculation method. This means that different factors are taken into account:

- Level of thermal insulation;
- Airtightness;
- Valuation of solar gains;
- Ventilation;
- Efficiency of heating and hot water systems;
- Use of renewable energy sources.

Since the implementation of this directive, advertisements for sales or rentals must also mention the energy performance of buildings so that prospective buyers or tenants can compare the energy performance of properties placed on the market.

### → Walloon region

In Wallonia, the regulations on the energy performance of buildings (EPB) apply to all buildings, for all construction, reconstruction and transformation work requiring planning permission.

Since May 1, 2016, requirements also apply to systems (heating and domestic hot water, air conditioning, ventilation) installed, replaced, or modernized, mainly in existing buildings, but also in new buildings.

### → Brussels-Capital Region

For the Brussels Region, the EPB regulations are a major tool for achieving the objectives of reducing CO<sub>2</sub> emissions, given that the consumption of buildings accounts for 70% of

overall energy consumption. The range of regulatory measures on the energy performance of buildings can be summarized in three areas:

- The “EPB Certification” component, which allows candidate tenants and landlords to compare properties in terms of their energy performance;
- The “EPB work” component during construction or renovation, subject to an urban planning permit; each property must comply with EPB requirements aimed at achieving high energy performance and a healthy indoor climate;
- The “EPB Technical Installations” component, which can be a major source of energy savings. To guarantee a minimum level of energy performance, heating and air-conditioning systems are now subject to certain requirements and various controls.

### → Flemish region

There are two types of compulsory certificates in the Flemish Region: the EPB calculation to be drawn up for a new-build project or renovation, and the EPC calculation to be drawn up for the sale or letting of a dwelling.

#### A. Energieprestaties en Binnenklimaat

(EPB – Energy Performance and Indoor Climate)

All buildings in Flanders requiring an urban development permit must meet certain EPB standards.

Buildings must achieve a minimum level of insulation, energy efficiency or energy performance and ventilation. The exact requirements depend on the purpose of the building, the nature of the works, and the date of the building permit application or notification.

#### B. Energieprestatiecertificaten

(EPC – Energy performance certificates)

An energy performance certificate shows how energy-efficient a house, apartment, or small non-residential building is. Depending on the type or use of the building, the layout and content of the EPC is different. Five different EPCs can be issued:

- residential EPC;
- building EPC;
- small non-residential EPC;
- EPC common sections of the apartment building.
- public building EPC

### 3.3 Other energy performance labels and certificates (not required by law)

The EPB certificate is a mandatory document in all three regions. However, other labels and certificates attesting to energy performance can be issued to Belgian buildings on formal request or through official application. Awarded by public authorities or accredited third-party organizations, these certificates and labels assess the impact of the building stock on the environment and are widely used throughout Belgium.

Here is a non-exhaustive selection of certificates and labels issued by public authorities and independent Belgian certifying bodies to the national building stock:

#### A. Belgian labels and certificates:

##### → TOTEM (Tool to Optimize the Total Environmental Impact of Materials)

Created in 2011, TOTEM is a free tool that assesses the impact of building materials on the environment at any stage of building design. The result of a partnership between OVAM (the public waste management company of the Flemish Region), the Public Service of Wallonia, and Brussels Environment, TOTEM has also been developed in accordance with European standards for the life cycle analysis of materials and buildings.



##### → Construction Quality Label

Construction Quality (CQ) is a national quality label that underlines the commitment of contractors, architects and design offices to work in an environmentally responsible manner. A CQ contractor is aware of his legal obligations in terms of sustainable building and the various subsidies that the client can benefit from if he makes energy-saving investments.

The purpose of the Construction Quality label is therefore to establish confidence in the company's good organization, in its technical competence and in the fact that it works in a qualitative manner, strives for sustainable development, and takes the necessary measures for environmental management and the safety of workers and clients.



[www.constructionquality.be](http://www.constructionquality.be)

##### → The Ecodynamic Enterprise Label (Brussels-Capital Region)

Official and free recognition, the Ecodynamic Enterprise Label rewards and encourages Brussels companies, associations and institutions that act to reduce the impact of their activity on the environment. This label, which is aimed at any type of organization with a business site in Brussels, is graduated since one, two or three stars can be awarded according to the candidate's environmental performance.



[www.ecodyn.brussels](http://www.ecodyn.brussels)

##### → NRQual (Walloon Region)

NRQual is an official quality label for companies installing renewable energy systems (solar photovoltaic systems, heat pumps, and solar heating systems) in Wallonia.



[www.energie.wallonie.be](http://www.energie.wallonie.be)

## B. International labels and certificates issued in Belgium:

### → BREEAM (Building Research Establishment Environmental Assessment Methodology)

BREEAM is an international method for assessing the environmental performance of buildings developed by the Building Research Establishment (BRE) that sets ambitious "sustainable" goals for any building project during its design, construction and throughout its use. BREEAM certification is carried out by an accredited third-party organization.



[www.breeam.com](http://www.breeam.com)

### → LEED (Leadership in Energy and Environmental Design)

LEED is a globally recognized certification system developed by the U.S. Green Building Council (USGBC) to encourage the construction of energy- and resource-efficient buildings that are healthy to live in. Available for virtually all building, community and home project types, it provides a framework to create healthy, highly efficient and cost-saving green buildings.



[www.new.usgbc.org](http://www.new.usgbc.org)

### → WELL

The WELL Building Standard is an American certification created by the WBI (Well Building Institute), a working group bringing together experts from the building and medical worlds. It certifies the quality of design, layout, and operation of buildings with regard to users' health and well-being.



[www.wellcertified.com](http://www.wellcertified.com)

### → HQE™ (Haute Qualité Environnementale – High Environmental Quality)

The HQE™ certification is a voluntary process for construction, renovation or operation that certifies the performance of all types of buildings and responds to the major challenges of sustainability. It also reflects a balance between respect for the environment, quality of life and economic performance through a global approach.



[www.hqegbc.org](http://www.hqegbc.org)

### → Standard ISO 14001

Internationally recognized standard ISO 14001 can be applied regardless of the size or sector of activity of the company and defines a framework for environmental management, without integrating minimum requirements or social, economic, quality, health, or communication requirements. The organization concerned must provide a commitment in terms of continuous improvement and operation of the company in favor of the environment. The certification is carried out by an accredited third-party organization.



[www.iso.org](http://www.iso.org)

### 3.4 Belgium: a leader in the transition to sustainable building

In other words, in view of the adoption of ambitious energy performance requirements—including the application of NZEB measures at the regional level—the mandatory issue of EPB certification, and numerous other optional national and international certificates and labels for the entire Belgian building stock, it is undeniable that Belgium is working resolutely to achieve the CO<sub>2</sub> emission reduction targets set at the European level. In this respect, Directive 2010/31/EU was a strong driver in getting the EPBD implementation to a higher level in Belgium, where the average energy performance of new buildings is now improving every year.

In order to improve the energy efficiency and sustainability of its building stock, the three regions of Belgium have also implemented long-term renovation strategies. Indeed, in Belgium, where almost three-quarters of the residential building stock pre-dates 1980 (see point 4), the implementation of financial measures, such as regional grants to encourage sustainable renovation, is also a further step in the direction of sustainable building. Due to the strict application of Directive 2010/31/EU in Belgium, the need for sustainable building will only increase in the coming years and Belgian know-how in this field will develop further. Current trends in the sector confirm these hypotheses.

## 4. (Eco)construction galore

### 4.1 Building stock

According to Statbel, the Belgian statistical office, the number of buildings in Belgium increased by 14.5% to a total of 4,573,099 buildings between 1995 and 2020. The number of dwellings rose by 25.8% to 5,577,016 units over the same period.

During the same period, the number of dwellings in the Flemish Region increased by 27.7% and the number of buildings by 15.4%. In the Walloon Region, the number of dwellings increased by 25.4% and the number of buildings by 14.9%. Finally, in the Brussels-Capital Region, although the increase in the number of buildings was less pronounced (+1.1%) than in the other two regions, the number of dwellings increased by 17.7%.

### 4.2 Building permit

#### A. For residential construction

During the first seven months of 2020, this upward trend in Belgian real estate stock was confirmed by the number of building permits granted for the construction of residential buildings, which increased by 3.8% compared to the same period in 2019, reaching a total of 16,535 buildings.

In the Flemish Region, the increase was 5.6%. In the Walloon Region, the number of building permits granted for the construction of residential buildings decreased by 1.8%. In the Brussels-Capital Region, the number of building permits granted for the construction of residential buildings over seven months is equivalent to that of the same period in 2019.

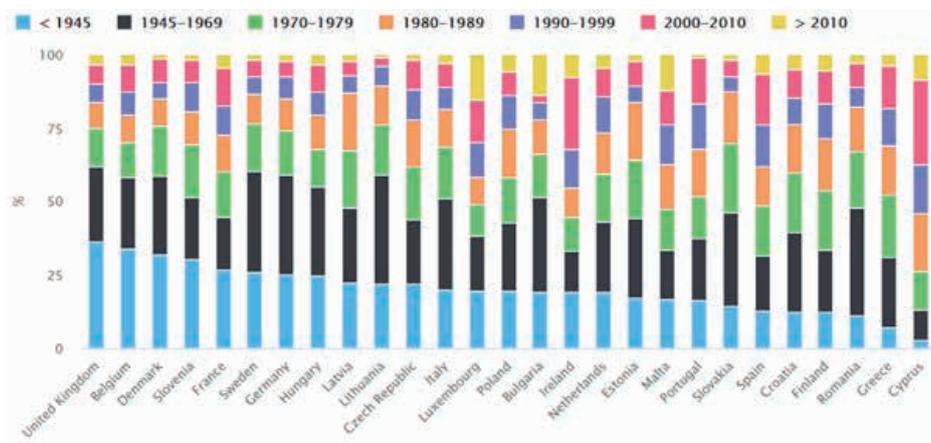
	Belgium		Flemish Region		Walloon Region		Brussels-Capital Region	
2015	12,704	(-35.6%)	8,932	(-36.6%)	3,641	(-33.7%)	131	(-4.4%)
2016	15,023	(+18.3%)	11,265	(+26.1%)	3,622	(-0.5%)	136	(+3.8%)
2017	12,222	(-18.6%)	8,043	(-28.6%)	4,063	(+12.2%)	116	(-14.7%)
2018	18,343	(+50.1%)	14,262	(+77.3%)	3,982	(-2.0%)	99	(-14.7%)
2019	15,930	(-13.2%)	11,975	(-16.0%)	3,874	(-2.7%)	81	(-18.2%)
2020 (first 7 months)	16,535	(+3.8%)	12,649	(+5.6%)	3,805	(-1.8%)	81	(0.0%)

Source: Statbel – Annual figures: number of new residential buildings authorized and changes compared to the previous period (2020).

## B. For residential renovation

In Belgium, about 75% of the residential building stock is pre-1980 (see graph below). However, the age of buildings also varies greatly from one region to another. In Flanders, 32.2% of buildings were built after 1981, compared to 21.4% in Wallonia and only 6.7% in the Brussels-Capital Region.

In order to survive in its environment, the vast majority of the Belgian building stock will therefore need to undergo sustainable renovation work to improve the energy performance of buildings, reduce CO<sub>2</sub> emissions, and thus limit the rise in global temperatures.



Source: European Commission – EU Buildings Factsheets: Breakdown of residential building by construction year (2014)

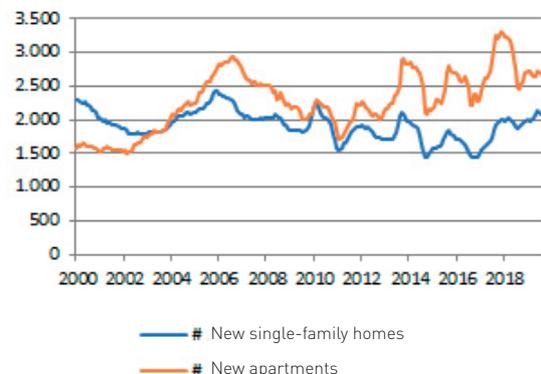
As a result, since 2007, the number of building permits granted for the renovation of residential buildings has generally been higher (except in the second quarter of 2018) than the number of building permits granted for new residential construction. Since 2017, however, the gap has remained very small.

In addition, more permits have been issued for the construction of new apartments than for the construction of new single-family homes since 2003, which explains the significant increase in the number of dwellings in 4.1. While permits issued for new apartments and new single-family homes were at about the same level in 2010-2011, the gap has widened in favor of apartments over the past decade.

### Moving average over the last 12 months



Source: Statbel – building permits (2000-2020)



Source: Statbel – building permits (2000-2020)

## Sustainable renovation

The energy renovation of a building is based on an overall approach composed of three interdependent pillars: ventilation, thermal insulation and airtightness.

**Ventilation** refers to air conditioning by cooling or heating, humidity control, and control of CO<sub>2</sub> levels. It is essential for replenishing indoor air saturated with pollutants.

As they are interdependent, the installation of a ventilation system and airtightness work must be carried out simultaneously.

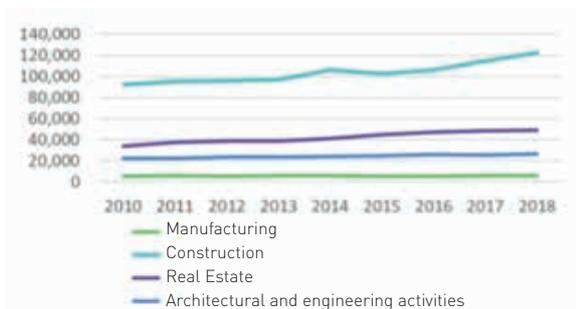
**Thermal insulation** provides real thermal comfort and better conservation of the building. Good insulation of the building envelope significantly reduces energy costs.

**Airtightness** avoids draughts and any uncontrolled entry of cold air. It also protects the structure of the building from mold and mildew, prevents the air from drying out in winter, and keeps the rooms cooler in summer.

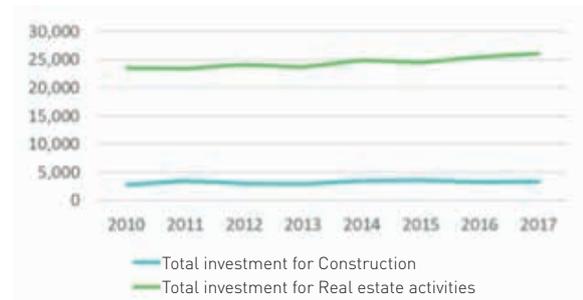
## 4.3 Flourishing economic activity

The constant increase in the Belgian real estate stock and the growing number of permits for residential construction and renovation has of course also led to greater economic activity in the construction sector. In this way, according to the European Construction Sector Observatory, the number of enterprises in the broad construction sector grew by 33.2% in Belgium between 2010 and 2018 (204,476 enterprises) and employment by 19.0% over the same period. In parallel, the turnover of the broad construction sector in Belgium grew by 41.1% between 2010 and 2018

As the turnover of this growing number of companies in the broad construction sector increases, total investment in the sector also grew by 13.3% between 2010 and 2018. Notably, investment in the narrow construction sub-sector increased by 21.1%, from EUR 2.7 billion to EUR 3.3 billion, while investment in real estate activities increased by 10.5%, from EUR 23.5 billion to EUR 26.0 billion. Belgian households also contribute to investments in constructions through spending on the renovation of dwellings, which increased by 23.1% over the 2010-2017 period, from EUR 2.3 billion to EUR 2.9 billion.



Source: Eurostat, 2019: Number of enterprises in the broad construction sector in Belgium between 2010 and 2018



Source: Eurostat 2019: Investment in the Belgian construction industry between 2010 and 2017 (EUR M)

## 4.4 A positive outlook for the Belgian (eco) construction sector

As previously mentioned, digital and innovation investments in the construction sector are rising due to increased revenues. In fact, as construction projects become more complicated due to evolving energy efficiency regulations, companies in the sector are adopting the latest digitization technologies such as building information models (BIMs), 3D-printing, drones, augmented or virtual reality, and Internet of Things (IoT) in order to improve efficiency and productivity.

In Belgium, where numerous research centers, clusters and incubators foster eco-innovation and sustainable construction, innovation performance is a key element in achieving national environmental objectives. In this regard, the Belgian Building Research Institute (Centre scientifique et technique de la construction [CSTC] Wetenschappelijk en Technisch Centrum voor het Bouwbedrijf [WTCB]), a private research center, plays a key role in boosting research and innovation in the construction sector. It aims to provide technical support to innovation activities, tailored to the specific needs of its more than 90,000 members, mostly construction SMEs. Additionally, the Institute runs the Centre for Excellence in Sustainable Construction (CESC), which encourages construction companies to incorporate the latest research and technological innovations in a bid to promote more sustainable building and renovation.

According to the European Construction Sector Observatory, following an increased level of investments—most notably in innovation—the broad construction sector output in Belgium is expected to expand by 2.6% and 2.3% in 2019 and 2020, respectively. Correspondingly, employment in the broad

construction sector is forecast to increase by 3.9% annually in 2019 and 2020. Finally, the turnover of the broad construction sector is, for its part, expected to experience a 3.6% and 7.3% increase in 2019 and 2020, respectively, in comparison to 2018. The sector is therefore expected to grow in the coming years, despite some challenges that need to be tackled, including skills shortages.

As mentioned, it is undeniable that the European legislative framework applicable to the construction sector, more specifically Directive 2010/31/EU on the energy performance of buildings, has led to the adoption of national policies aimed at achieving European environmental objectives by 2050 as part of the “Green Deal.”

In Belgium, the measures implemented by the local authorities have led to an increase in activity in the construction sector. Indeed, since the implementation of Directive 2010/31/EU, the number of Belgian buildings and the number of building permits granted for residential construction and renovation in the country have increased significantly. As a result of the increased demand for construction and renovation, the number of companies and employment in the sector has also increased significantly.

In addition, the increase in sales resulting from the growth in their activities has enabled companies in the sector to invest in the innovation and digitization of their solutions. These investments are, of course, also directed towards the development of environmentally responsible construction techniques in a sector that is in full transition towards sustainability, an area in which Belgium is resolutely leading the way.

## SECTION 1.2

# SMART CITIES

### A. Emergence of Smart Cities

The United Nations projects that by 2050 more than two-thirds of the world population, or close to 7 billion people, will live in urban areas. In order to accommodate all these people, sustainable building solutions will be needed. However, such building solutions will, in turn, have to be integrated into a broader solution: a truly Smart City.

The European Commission describes a Smart City as “[...] a place where traditional networks and services are made more efficient with the use of digital and telecommunication technologies for the benefit of its inhabitants and business.”

The said benefits can be very broad and related to any aspect of city life, including good and innovative governance (from waste management to emergency responses and urban planning), fluent mobility, healthy environment, public safety, economic prosperity, efficient healthcare, and so on.

The digital and telecommunication technologies mentioned in the definition of the European Commission on the other hand include areas such as data capturing and processing, robotics, Augmented Reality and Artificial Intelligence. Belgium plays a strong role in these technologies, as shown in the “Belgium Made Different – Industry 4.0” publication. It is therefore not surprising that some of these technologies are applied in Smart Cities.

While the emergence of Smart Cities is a global phenomenon, Belgium is a natural ally due to the importance of cities for the country. And also because of the need for its companies to be smart.

### B. Belgium as a natural Smart City ally

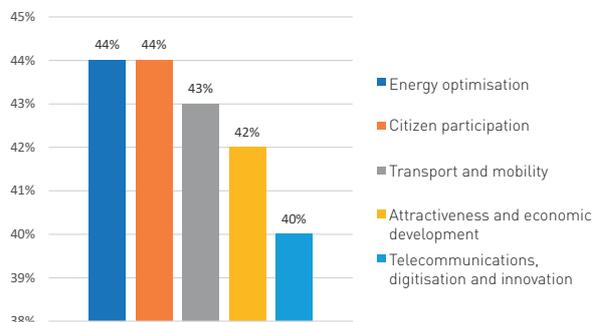
#### 1. Belgium: a country made out of cities

According to data from the World Bank, Belgium is among the top 10 most urbanised countries in the world and the most urbanised European country except for the city states

of Monaco and Vatican City. Moreover, Belgium is the most urbanised nation in the world with over 10 million inhabitants. As a result, the country is particularly interested in Smart Cities.

Belgian cities and communities are increasingly experimenting with Smart City applications. According to the annual Smart Cities Barometers from the Smart City Institute, so far Belgian cities have focused most of their effort on Energy Optimisation and Citizen Participation.

Most common applications of Smart Cities in Belgium (as % of Belgian cities and communities)



Source: Smart Cities Barometer 2018

#### 2. Belgium: a country reliant on smart solutions

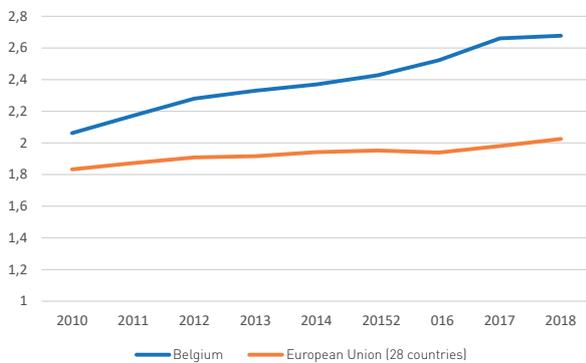
Belgium’s economy relies on exports, more so than almost any other country in the world. The value of exports account for around 85% of Belgian GDP. In order to be competitive abroad, Belgian companies are obliged to find ever better, stronger and smarter products and services than their international competitors.

Smart Cities, almost by definition, require new ideas and solutions, often very complex ones. This means investing generously in Research & Development, innovation and digitalisation. Belgium and Belgian companies have taken up the challenge.

## 2.1 Focus on R&D

Belgium is among the frontrunners in the field of Research and Development, with R&D expenditure amounting to around 2.7% of GDP. This is significantly more than the EU-28 average.

**Total gross domestic spending on R&D, % of GDP, 2000 – 2018**



Source: OECD

This trend is also evident when we take a closer look at Research and Development expenditure by the business enterprise sector. Across 41 of the most high-performance areas in the world, Belgian enterprises rank 8<sup>th</sup>.

**Research and development expenditure by the business enterprise sector, % of GDP, 2018**

1	South Korea	3,64
2	Japan	2,6
3	Sweden	2,36
...	...	...
8	Belgium	1,87
9	Finland	1,81
10	China except Hong Kong	1,66
...	...	...
14	France	1,43
15	Netherlands	1,42
16	EU-28	1,41
...	...	...
41	Latvia	0,11

Source: Eurostat

## 2.2 Focus on innovation

The above-mentioned expenditure on Research and Development inevitably leads to innovation.

In the European Innovation Scoreboard 2020 (EIS 2020), which is an initiative by the European Commission to assess research and innovation performance, Belgium is listed as a “Strong innovator”. Even more importantly perhaps, the country’s performance is constantly improving, also in relation to the EU. This may be an indication that the sustained efforts, also by the stakeholders in this publication, are starting to pay off.

This Strong innovator label is largely an achievement made possible by the strong performance of companies as innovators. The Belgian economy relies extensively on highly specialised and skilled SMEs. According to the European Innovation Scoreboard, these SMEs score very well when judged in terms of product and process innovations, as well as innovating in-house.

### SMEs with most product or process innovations in EU-28

1	Portugal
2	Finland
3	Netherlands
4	Belgium
5	Austria

Source: EIS 2020

### SMEs with most in-house innovation in EU-28

1	Portugal
2	Finland
3	Belgium
4	Greece
5	Italy

Source: EIS 2020

While innovative companies are an indispensable factor for the creation of Smart Cities, cooperation between these private partners, the public sector and academic & research institutions is needed in order to ensure a truly successful project. In two thirds of cases, the public sector is the lead initiator of Smart City projects in Belgium, followed by private partners and universities or civil society initiatives.

Each party brings its own solutions to the table, which will eventually turn into innovative and successful projects that can be implemented on a large scale.

This collaboration is exactly what Belgium is known for. On the European Innovation Scoreboard 2020, Belgium ranks second in the EU with respect to Innovation linkages and collaboration. The report implies that Belgian companies have more versatile innovation capabilities on account of engaging in innovation partnerships with other companies or public-sector organisations, while the research systems are geared towards meeting the demand from companies, as highlighted by private co-funding of public research.

Part of this public research comes from universities. A Belgian university, KU Leuven, headed the most recent list of Europe's most innovative universities, a position it has held since 2016. According to this ranking, drawn up by Reuters, KU Leuven is the seventh most innovative university in the world, after six universities based in the USA. There are no fewer than seven Belgian universities in the top 100, with Ghent University, the Universit   Libre de Bruxelles, Vrije Universiteit Brussel, Universit   Catholique de Louvain, the University of Li  ge and the University of Antwerp also featuring.

### 2.3 Focus on digitisation

While R&D and even innovation are rather broad terms that can be applied in many areas, Smart Cities are largely focussed on digitisation. In this field too, Belgium can demonstrate noteworthy accomplishments in the 2020 "Digital Economy and Society Index" (DESI) reference ranking.

No smart city can exist without a good digital connection. Belgium is, along with Cyprus and Malta, among the top three leaders in Next Generation Access (NGA) broadband coverage in the EU. Belgium and the Netherlands are ahead of other Member States in NGA take-up.

#### Next generation access (NGA) broadband coverage in the EU (% of households), mid-2019

1	Cyprus
2	Malta
3	<b>Belgium</b>
4	Netherlands
5	Luxembourg

Source: DESI 2020

A Smart City needs businesses that open up new opportunities and boost the development of new and trustworthy technologies. In the DESI 2020 report, Belgian companies are included among the top European performers based on the integration of digital technologies.

The report notes that digital transformation enables businesses to gain competitive advantage, as well as improve their services and products and expand their markets. Something Belgian companies deploying technologies in the development of Smart Cities are doing to an increasing extent.

#### Integration of digital technologies, business digitisation index, 2020

1	Finland
2	Netherlands
3	<b>Belgium</b>
4	Denmark
5	Ireland

Source: DESI 2020

The technology that is perhaps of the greatest interest for the realization of Smart Cities is the management of big data. For this reason, in order to develop a truly smart and learning city, companies are needed that are capable of collecting, storing and analyzing data.

Once again, Belgian companies are in the top three in this field, according to the 2020 Digital Economy and Society Index.

#### Top 5 countries with enterprises analysing big data from any data source, 2018

1	Malta
2	Netherlands
3	<b>Belgium</b>
4	Ireland
5	Finland

Source: DESI 2020

## C. Some specific projects

According to the Smart Cities barometer 2018, the municipalities in Brussels launched an average of 5 projects, while the municipalities in Flanders and Wallonia had an average of 3 projects per year. Since then, the efforts have constantly been on the increase, as has the output.

A number of current and future projects from the many applications of Smart Cities in Belgium are highlighted in this publication. They are focused on three fields:

We would like to thank Smart Cities Vlaanderen (Flanders), Agence du Numérique (Wallonia) and Brussels Smart City & CIRB (Brussels) for selecting a few of the numerous initiatives that are taking place in Belgium.

It is important to note that all the initiatives mentioned below are scalable internationally, so do not hesitate to get in touch to find out how the solutions can be applied in your city.



### Smart Environment

- Brussels trees ask for water themselves (Brussels)
- Coléco, the eco-responsible local energy communities (Wallonia)
- Leak detection technology (Flanders)



### Smart Governance

- Fix My Street (Brussels)
- Sentinel trucks (Wallonia)
- VLOCA – Flemish Open City Architecture (Flanders)



### Smart Mobility

- Connecting the dots - MobiCoN (Flanders)
- Fais tes balises / Pack your beacons (Wallonia)
- Smart Parking for Disabled People (Brussels)



## Smart Environment Brussels



### Brussels trees ask for water themselves

Trees need water, everyone knows that. Not too much and not too little, but not everyone knows where the threshold lies. Nonetheless, this is necessary for healthy trees: after all, too much or too little water and the tree is done for.

The Brussels-Capital Region wanted to do something about this. The hundreds of trees along the regional roads are regularly watered in the first three years as young plants. This is essential to assure their growth and to ensure they become self-sufficient in terms of water. After that, trees received water in a standard way, whether they need it or not.

In order to improve this situation, both for the trees and those responsible for watering them, Brussels Mobility came up with a solution. Newly planted trees are equipped with smart technology for optimum monitoring of their watering. This is made possible through checks by sensors and tensiometric probes, which monitor the soil's moisture level and the trees' water requirement, depending on their physiology and the climate and on the amount of water available in the soil. Data is then sent to an application that proceeds to send out notifications, with watering sessions planned based on this.

This year, around 560 trees have benefitted from this technology and additional projects are currently under development. Ultimately, the intention is for each of the 32,000 trees along the regional roads and in public spaces to use this system. Several examples that were recently implemented or are planned in the short term are Chaussée de Mons, Square Pol Bury, Porte de Hal, Drève Olympique, Boulevard du Régent and Boulevard Henri Simonet.

Using a cartographic management system with geolocation, it is also possible to monitor the characteristics and status of each of these 32,000 trees along the regional roads and in public spaces. This increases the efficiency of the monitoring and maintenance considerably.

This automated care for our trees, along with smart technologies, can only be good for Brussels' trees, and Brussels will become an even greener region – and smarter, to boot – that offers the best for everyone.

Source of the text:

<https://smartcity.brussels/news-773-brussels-trees-ask-for-water-themselves> (with thanks to CIRB / Brussels Smart City)



**Smart Environment Wallonia**



## Coléco, the eco-responsible local energy communities

The aim of the COLECO project is to trigger a local dynamic of collective self-consumption in Picardy Wallonia by rolling out digital tools leading to the creation of eco-responsible local energy communities, i.e. communities of neighbors who together produce and consume sustainable local energy. The project is headed up by IDETA in collaboration with the intermunicipal agency IEG, the municipalities of Picardy Wallonia, COOPEM (Coopérative Energie Mouscron) and the company HAULOGY, which specializes in the development of software for players in the energy sector.

The development of local energy communities is one of the objectives of the Walloon Government, which has set up a legal framework to promote their development and plans to deploy smart meters in Wallonia from January 1, 2023.

Collective self-consumption has many economic, environmental and social advantages: it will ultimately lead to savings in the development and reinforcement of the distribution network and will generally have a positive impact on the bills of the participants in these communities. The synchronization of production and consumption on a local scale will make it possible to reduce demand on the network and facilitate a better integration of so-called

intermittent renewable energies. Owning a smart meter will be essential to be able to participate in a renewable energy community; the 'smartization' of the network will make citizens aware of the need to adapt their electricity consumption patterns.

Beyond the economic benefits and the positive dynamics of citizen participation that it generates, collective self-consumption will encourage the deployment of renewable energy production units and thus contribute to the region's energy transition and security of supply.

The COLECO project is part of the 'Wallonie picarde Energie Positive' approach coordinated by IDETA, whose objective is to bring together the initiatives carried out by the municipalities in order to make a success of the region's energy transition. These initiatives take the form of projects focusing on alternative mobility, the renovation of municipal buildings or the production of renewable energy. So far, 20 municipalities have come on board through the Covenant of Mayors for Energy and Climate and have drawn up a Sustainable Energy and Climate Action Plan (SEAP) to cut their CO<sub>2</sub> emissions by 40% by 2030.

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Source of the text: <https://ideta.be/projets/communautes-locales-denergie-eco-responsables/> (with thanks to Agence du Numérique / Digital Wallonia)



## Smart Environment Flanders



## Leak detection technology

The Vietnamese capital city Hanoi covers an area of 3,359 km<sup>2</sup> and is divided into 30 districts with a population of approximately 7.8 million inhabitants. The Hanoi Water Company Hawacom supplies 1 million m<sup>3</sup> of potable water to the population every day. Hawacom has vowed to reduce its water losses to less than 10% in three years. At the end of 2019, the total water loss rate was still as high as 17.5%.

In recent years, Hawacom has already invested a great deal in materials and training to detect and repair water leaks. To realize the ambition and further limit leakage loss, Hawacom and HydroScan signed a cooperation agreement in December 2019 to deploy LeakRedux® smart leak detection technology. The collaboration came about thanks to export financing via the Belgian federal government (Finexpo). HydroScan is implementing LeakRedux® for 150 DMA (District Metered Area) zones in Hanoi.

### How does LeakRedux® work in essence?

- The principle is as follows: LeakRedux® software makes continuous comparisons between real-time water consumption, measurement with virtual sensors, and «normal» historical water usage predicted by smart algorithms. In the event of deviations, alarms are generated, even with small hidden leaks. The software allows:
  - increasingly precise detection of leaks
  - faster detection of leaks
  - more precise quantification of leak volumes and prioritization of leak repairs;

- HydroScan is committed to providing constant support during implementation. HydroScan distinguishes itself from other solutions that rely more on software expertise. HydroScan is an expert team of seasoned water engineers with extensive practical experience. HydroScan is currently training around 20 leak operators. This enables knowledge to be transferred and the customer can take full control of the operational work.
- HydroScan also assists Hawacom in making the effective detection and sealing of leaks more cost-effective after the leaks have been detected. The detection zones for leaks can be significantly reduced by using specific modeling techniques, for example. This saves time and money.

### LeakRedux® identifies two types of leaks:

- When a major leak occurs, a high alarm is generated immediately for the specific zone. Operational staff can take immediate action to minimize water loss and prevent the occurrence of sinkholes.
- LeakRedux® also detects small and often invisible leaks. It also predicts the most economical intervention time for the repair, allowing the user to narrow the leak detection zone.

### Important economic and social relevance

In addition to direct economic savings, Hawacom will be able to provide more households and more residents with potable water. Given the growth of the population, this is an important target for Hanoi.

Source of the text: Smart Cities Vlaanderen



## Smart Governance Brussels



### Fix My Street

The Fix My Street Internet and mobile platform developed by BRIC on the initiative of Brussels Mobility offers members of the public and the authorities a means of reporting incidents in public areas in Brussels (lighting, marking, urban furniture, signs, damage, littering, etc.) and following each stage in the resolution of the incident.

The platform brings together a number of players in the region: the 19 Brussels communes, Brussels Mobility, Bruxelles-Propreté, the STIB public transport company, Sibelga, Vivaqua, Proximus, etc. They work together to implement the project and resolve the incidents reported. Many features are developed and provided by Fix My Street to facilitate and speed up information exchanges internally and with citizens.

On 3 December 2015, Agoria, the national federation of the technology industry, presented the Fix My Street application with the 'Smart City' award.

Since June 2017, the Fix My Street app, along with toll-free number 0800/981 81 of the Bruxelles-Propreté/Net Brussel agency, can now also be used to report the presence of rubbish and illegal dumping on public roads. Extending the scope of action of Fix My Street in this way meets a request from citizens, cleanliness being listed among their top three concerns.

Since April 2018, all Fix My Street's data are available as open data on the Brussels regional portal, [www.datastore.brussels](http://www.datastore.brussels) for monitoring, analysis and public transparency.

Fix My Street is available free of charge via the Apple Store and Google Play. An online version of the application can also be used at the address [www.fixmystreet.brussels](http://www.fixmystreet.brussels).



## Smart Governance Wallonia



## Sentinel trucks

For a long time, the BEP, the Economic office of the Province of Namur, has been looking for a way to add value to the rounds of garbage collection trucks. An idea prompted by the fact that these trucks roam all the roads of the Province of Namur throughout the year. With «sentinel trucks», equipped with smart boxes, these rounds can be used to capture data on the territory, without adding any more traffic.

The BEP has just submitted this idea as part of a Walloon call for projects for smart regions: a solution based on sensor hubs, placed on the collection trucks, into which partners can easily and cheaply plug in their data sensors. Information on air quality, the connectivity of a given area, road conditions, meteorological data, to name but a few applications, could be recorded.

The data collected in this way will provide a better knowledge of the Namur region and can go on to be used as a decision-making tool for the BEP, its partners and local and supra-local stakeholders in the region.

This in-depth knowledge of the Namur region, which is predominantly rural, fits in neatly with one of the BEP's strategic objectives to boost its attractiveness and innovative character. This can only be done by starting off with an inventory of this region, to identify its challenges, needs and strengths.

In addition, through its «Smartcity by BEP» action program, the BEP aims to bring Municipalities up to speed on the challenges linked to digital technology. Today, data, in particular its exploitation by local authorities, is undeniably one of these challenges.

This is why the BEP is launching the «sentinel trucks» project, with a pilot partnership with the BIPT (Belgian Institute for Postal Services and Telecommunications), which wishes to equip the garbage trucks covering the municipalities of Profondeville, Gedinne and Viroinval with sensors to measure their telecoms coverage. Once these measurements have been carried out, the BIPT will be able to assess the connectivity of this territory with total objectivity and independence, in consultation with the local players concerned.

The BEP will supply its trucks, sensors and Open Data platform, while the BIPT will develop the software needed to analyze the performed measurements.

The University of Namur will also be a major project partner and offer methodological support and guarantees regarding the quality of the data.

For its part, the Luxembourg economic development agency Idelux will be in charge of checking the replicability of the BEP project in its region, by testing the sensors on its own fleet of garbage collection trucks.

With this pilot project, the BEP and its partners will have access to a practical tool for measuring the impact of the efforts made by all the regional players in terms of 3G and 4G connectivity, and will then be able to adopt practical measures to ensure that all citizens and businesses established in the Province of Namur, and particularly in rural areas, have access to a high-performance mobile telecommunications network, driving economic development and the attractiveness of the territory and supporting social inclusion along the way.

Source of the text: <https://www.bep-environnement.be/actualites/camions-sentinelles-le-bep-souhaite-collecter-des-donnees-via-ses-camions-poubelle/> (with thanks to Agence du Numérique / Digital Wallonia)



## Smart Governance Flanders



## VLOCA – Flemish Open City Architecture

In Flanders, there is a need for a common (open) data policy and an infrastructure allowing data to be exchanged between different levels of government. This will enable it to evolve from a collection of smart islands to a sustainable smart region.

To that end, the Flemish Open City Architecture (VLOCA), an umbrella Flemish structure to streamline the multitude of local initiatives, was developed. VLOCA offers a building plan for a smart municipality, city or region so that local authorities do not have to reinvent the wheel every time. Through VLOCA, local authorities can easily make use of existing knowledge and initiatives that were previously fragmented. The focus will be on the local authorities in order to keep the story of the smart city manageable for smaller municipalities that have less technical expertise.

Imec and VITO are developing VLOCA, in a co-creation project with local governments, the business community, research institutions and other stakeholders, commissioned by the Agentschap Binnenlands Bestuur, in order to create a widely supported frame of reference for projects in smart cities, municipalities and Flanders. This frame of reference contains, among other things, agreements and guidelines on the exchange of data between the various IT systems. This will enable Flanders to arrive at a single uniform architecture that can guide all local authorities and the business world in the development of the smart applications of tomorrow.

The knowledge hub plays a central role in the development

of VLOCA. It will share the results of VLOCA and the roadmaps online so that everyone can get started. Moreover, the knowledge hub will become a place for co-creation with all those involved. Interested readers are invited to help shape this architecture through co-creation on this MediaWiki platform, based on their experience and expertise.

In the first phase, from July 2020, bottom-up initiatives will be captured via the knowledge hub in order to gradually and iteratively build up the open architecture. A blueprint of the reference architecture has been initiated. The co-creation process will gradually become more richly enhanced.

In the start-up phase of the VLOCA program, Imec and Vito conducted a study into existing and current open smart city practices and standards. There will be continuous and organic alignment with the identified initiatives during the VLOCA trajectory. In addition, alignment with the international Smart Cities ecosystem will also take place.

More info:

**[www.vloca.vlaanderen.be](http://www.vloca.vlaanderen.be) and [www.vloca-kennishub.vlaanderen.be/vloca-kennishub/](http://www.vloca-kennishub.vlaanderen.be/vloca-kennishub/)  
**[Welkom\\_bij\\_de\\_Vlaamse\\_Open\\_City\\_Architectuur\\_\(VLOCA\)\\_Kennishub](#)****



## Smart Mobility Flanders



### MobiCoN – Connecting the dots

Finding sustainable responses to ever-increasing mobility and parking pressure is one of the key challenges for cities. This is also the case in the Flemish city of Hasselt, where actors from the education and healthcare sector have ambitious growth and development plans, which in turn will increase the demand for structural mobility solutions for large groups of student and employee communities.

For this reason, the city council wants to focus on a thorough modal shift by seamlessly acquiring multimodality in smart and user-friendly networks, high-quality P&R solutions, shared mobility and well-equipped mobility points.

The MobiCoN project includes the elaboration of smooth access to several strategic locations in the city center via an alternative transport model based on mobility points. In concrete terms, several regional and sub-regional mobility points on Hasselt's territory will be equipped with mobility subsystems and high-frequency bus shuttles so that end users (employees/students) can easily reach their final destination.

Broadly speaking, the project comprises the following components;

- setting up mobility points at a number of strategic locations
- Mobility points need to be connected to each other via various solutions, including high-performance shuttle connections.
- *Mobility as a service* can only exist through an open data policy. In addition to the physical offer, the mobility point is also accessible via digital signs and an innovative app: in a one-stop-shop from A to B;
- Financial: consolidating the scalable business case and the commercial model for the participating "suppliers" and "users".

The realization of the project will be guided by Smart Cities Vlaanderen and VOKA Limburg, both network organizations for innovative companies.

In the first phase, which is currently underway, all steps will be taken in preparation for the actual implementation of the project: description of the necessary infrastructure (hardware and software) per mobility point and the desired services, analysis of the business case, division of tasks between partners and drawing up a step-by-step plan.

Subsequently, the project will be deployed on the basis of the project plan drawn up. This involves preparation of the sites, supply and installation of hardware (vehicles, stables, barriers, etc.), supply or development of software (access control, unlocking, payment, information, etc.), the appointment of suppliers for additional services (e.g. shuttles), the connection of (end) users, communication, etc.

For this project, a concrete partnership will be set up within a quadruple helix structure with parties such as governments (analysis of the business case and necessary financing, subsidy lines, infrastructure), knowledge institutes (conducting research, survey communities), private partners & companies (implementation of mobility solutions, technology, advertising, information, etc.) and users/communities (testing and soundboard).

The goal is to achieve a scalable business model in which the implementation of the project is supported by both the communities and the private side.

At this moment in time, a unique partnership already exists between the communities such as the city of Hasselt, the Jessa hospital, PXL, the University of Hasselt, the Grenslandhallensite, GO education, POM Limburg, etc. On the private side, innovative players will be looked at who can form a consortium to elaborate the solutions. Combining the networks of Smart Cities Vlaanderen and VOKA Limburg will play a major role in this regard.

Source of the text: Smart Cities Vlaanderen



Smart Mobility Wallonia



## Fais tes balises (Pack your beacons)

Combining technological innovation and environmental awareness, a major concern in recent months, the "Fais tes balises!" (Pack your beacons) mobile app, designed by the municipalities of Trooz and Chaudfontaine, is part of a smart mobility strategy that the region and its municipalities are crying out for. This app will draw on the treasure trove of unprocessed, paper-based data to inform citizens about a whole network of soft mobility possibilities.

Faced with a society in need of quick solutions to adopt alternative mobility and fight against global warming, these municipalities will propose a concrete tool to boost sustainable mobility, which is sorely lacking in visibility and structure, even though it is the cornerstone of the changes that need to be made.

The "Fais tes balises" project will integrate GPS technology that will allow the user to create a soft mobility itinerary (walking, cycling, public transport), whether for work or leisure, making it both functional and fun. More than a mapping application, "Fais tes balises" will provide citizens with an augmented reality experience, giving the subject matter an attractive dimension through the gaming possibilities it will lead to.

By digitalizing public data, together with unrecorded collective knowledge, this application will re-humanize the functional journeys of everyday life, which are today the preserve of the car. Sharing itineraries, classifying them by theme, allowing users to test and evaluate them, making stars out of the best contributors on the networks, developing communities of travelers, compiling points of interest, creating emotions along the itineraries and appealing to all five senses... These are the so-called beacons that will help shed light on a renewed, multimodal and citizen-oriented mobility today! This will allow the citizen to take ownership of the process and become an actor in the environmental and technological transition underway within the public service. Making the most of their knowledge and the wealth of their territory, analyzing flows, using data wisely, opening them up, sharing them and ensuring continuous community management, are some of the new challenges for municipalities and their partners.

With "Fais tes Balises", the municipalities of Chaudfontaine and Trooz intend to introduce this smart mobility from June 2021, serving also as a beacon of hope and constant improvement for the quality of life of our fellow citizens.

Source of the text: <https://www.trooz.be/actualites/actualites-2019/communique-de-presse-fais-tes-balises-003.pdf/> (with thanks to Agence du Numérique / Digital Wallonia)



## Smart Mobility Brussels

### Smart Parking for Disabled People

In short, Smart Parking for Disabled People locates all the available parking spaces for people with disabilities.

This project helps facilitate the mobility of people with disabilities in the city with a localization service telling them where the available disabled parking spaces are.

People with disabilities can now check the availability of these parking spaces in real time, following the installation of an IoT parking sensor in these parking spaces, which is self-powered and connected to the LoRA network and Orange's 4G network. The information about the availability of disabled parking spaces is made possible thanks to Open Data technology.

Thirty-three sensors have so far been installed in disabled parking spaces in the municipalities of Jette, Evere and Auderghem. The information about their availability is already made available through the On Wheels app ([https://](https://www.onwheelsapp.com)

[www.onwheelsapp.com](https://www.onwheelsapp.com)) and is also available via the parking.brussels app (<https://parking.brussels/fr/smart-parking/application-mobile>).

The use of IoT technology (sensors) combined with the use of 'Open Data' information is a real innovation. There is currently no similar service in Belgium.

BRIC oversaw and coordinated this ambitious project, together with various Belgian and European partners, including the government of the Brussels-Capital Region; the municipalities of Jette, Evere and Auderghem; parking.brussels; Communithings, the supplier of the IoT sensors; On Wheels.

More information at:

<https://www.youtube.com/watch?v=mrhJu-mjnZI>

Source of the text: <https://smartcity.brussels/news-650--biotope-brussels-introduces-smart-parking-for-persons-with-reduced-mobility> (with thanks to CIRB / Brussels Smart City)

## SECTION 2

# STAKEHOLDERS

## 2.1 OFFICIAL PARTNERS

### FPS Foreign Affairs

The promotion and defense of Belgian economic interests abroad is a top priority of the Federal Public Service (FPS) Foreign Affairs. This is done in a number of ways. FPS Foreign Affairs coordinates Belgium's ambitious trade and investment protection policy, it monitors market access problems and it provides diplomatic support to Belgian companies abroad. Moreover, FPS Foreign Affairs supports Belgian businesses in their international activities by coordinating the economic missions of HRH Princess Astrid, as Representative of His Majesty the King, and through the State visits led by His Majesty the King.

FPS Foreign Affairs also actively promotes Belgium's international image as a good place to do business, by participating in international forums, such as the International Expositions and the World Economic Forum, by organizing bilateral visits and by ensuring Belgium's multilateral action in the relevant international organizations.

Follow us on: [www.diplomatie.belgium.be/en](http://www.diplomatie.belgium.be/en)



### Flanders Investment & Trade

Flanders Investment & Trade (FIT) promotes international entrepreneurship in Flanders in a sustainable way as a key factor in the social and economic development of the region. FIT does so by supporting the international activities of Flemish companies and by attracting foreign investors to Flanders. FIT assists, supports and stimulates companies in international business. FIT offers tailored advice and guidance. Companies can call on its network of contacts both at home and abroad. And FIT provides financial support and information on a wide range of financial incentives.

Flanders has many assets for ambitious Flemish enterprises and SMEs as well as for interested international companies. For Flemish companies, its region acts as a perfect gateway to global markets. For them, FIT tries to lower the threshold to doing business abroad. FIT promotes its services, provides information and knowledge about export and offers networking opportunities between entrepreneurs and brings them into contact with potential partners abroad.

Flanders is a pole of attraction for foreign companies: thanks to its central location in Europe, its strongly developed infrastructure, its innovative clusters and numerous other strengths. FIT tries to offer them worldwide publicity. FIT adopts a tailored approach to potential investors and convinces them of the opportunities for their company in Flanders. Furthermore, FIT focuses on existing investors in Flanders planning to expand their businesses locally. Innovative clusters are of key importance to Flanders as a knowledge region. FIT assists these clusters in their internationalization process and tries to attract foreign investors capable of strengthening clusters to grow into major international players.

Follow us on: [www.flandersinvestmentandtrade.com](http://www.flandersinvestmentandtrade.com)



## Wallonia Export-Investment Agency (AWEX)

The Wallonia Export-Investment Agency (AWEX) develops and manages the international economic relations of Wallonia, the Southern region of Belgium. The agency, which employs more than 400 people, promotes the competitive advantages of Wallonia internationally.

AWEX makes use of its global network of more than 100 offices to strengthen in a sustainable way the image of Wallonia abroad. To promote international business relations, AWEX exchanges commercial information with both the international business community and Walloon companies.

The agency provides exporters, importers and potential investors with information on:

- the region of Wallonia and its export potential by means of macro-economic data
- Wallonia-based companies and their products/services
- the potential of Wallonia-based companies for international partnerships

Furthermore, AWEX assists companies based in Wallonia with a wide range of services in regard to their international activities such as:

- gathering information on foreign markets
- carrying out individual market studies upon request
- organizing trade missions, group stands at international fairs, and visits to Wallonia by foreign dignitaries and captains of industry
- promoting commercial contacts with international organizations
- providing financial incentives for export activities
- organizing professional training of specific commercial skills
- increasing awareness of international business opportunities

In addition, AWEX has a key role in the expansion or development of the business of potential foreign investors. It offers its expertise in how to establish a business in Wallonia, as well as provide them with detailed information and tailored made assistance on local investment opportunities.

Follow us on: [www.investinwallonia.be](http://www.investinwallonia.be) & [www.awex-export.be](http://www.awex-export.be)



## hub.brussels

hub.brussels, the Brussels Agency for Business Support is offering free-of-charge solutions and advice for start-ups and scale-ups in Brussels and beyond, as well as services focusing on strategy, financing, clustering and internationalisation.

One of the missions of hub.brussels is indeed to facilitate the internationalization of Brussels' economy by helping Brussels businesses compete in global markets. More than 90 economic and commercial attachés located on every continent provide free support to SMEs, approach potential local prospects and partners, organize networking events, ...

A "Welcome Package" is available to potential investors, providing them with fully equipped office space for three months and a wide range of services so that they can experience the advantages of setting up business operations in Brussels.

Follow us on: [www.hub.brussels](http://www.hub.brussels)



## 2.2 SUSTAINABLE BUILDING SOLUTIONS & SMART CITIES PARTNERS

### Agoria

Agoria is the branch association of Belgian companies operating in the technological industry, including digital, manufacturing and services industries. Numbering a 1900+ membership, representing no fewer than 300,000 employees, Agoria embodies *progress through technology* and paves the way for Belgian technology-inspired companies to improve and enhance the quality of life through the development and application of technological innovation, most notably in (smart) cities.

*Smart cities* are at the junction of infrastructure in place for energy, mobility and buildings. Moreover, an IT infrastructure and connectivity layer is vital as the level of data integration determines the smartness of the city.

Agoria launched its smart cities project in 2011. Apart from promoting a dialogue between the technology industry on the one hand and regions, cities, local authorities, policymakers and citizens on the one other, Agoria acts as the single point of access for cities and corporate tech players with expert know-how and in the realm of international smart city development.

Spanning the entire smart cities value chain at all levels of the ecosystem (technological, business modelling, finance, Agoria provides all stakeholders involved in smart city development with a neutral strategic platform for defining technological trends and devising innovative and possibly disruptive *smart* solutions to tackle the challenges faced by society at large and by cities in particular.

Agoria therefore acts as a facilitator towards accelerating the successful deployment of even the most ambitious smart city projects.

In so doing, it focuses on the following 3 key domains and priority areas of interest:

- Smart Energy
- Smart Mobility
- Smart Building

[www.agoria.be/en/Smart-cities](http://www.agoria.be/en/Smart-cities)

**.AGORIA**

### Belgian Building Research Institute

The Belgian Building Research Institute is a private research centre, its main stated objective being to carry out applied research in the construction industry, in order to improve its competitiveness.

Statutory BBRI members number over 100,000 Belgian construction companies (general contractors, carpenters, glaziers, plumbers, roofing contractors, floorers, plasterers, painters, etc.), most of them SMEs.

The BBRI has been set the following three main tasks:

- to perform scientific and technical research to the benefit of its membership;
- to supply technical information, assistance and advice to its membership;
- to contribute to a broad-ranging innovation effort by the construction sector, more specifically through contract research, either industry-driven or at the request of the public authorities.

In 2018, the BBRI created *Smart & Sustainable Constructions* Technical Committee, tasked to inform, support and activate the Belgian building industry in its quest towards smarter and more sustainable buildings.

An integrated approach and instruments to achieve this goal are developed and translated into concrete and usable solutions, new research and development and innovative applications in practice.

Sustained efforts made by the BBRI and its *Smart & Sustainable Constructions* technical committee allow the contractor to hold on to his pivotal role in the construction process and to develop new services and bespoke solutions, while keeping in mind urgent environmental considerations and increasingly stringent rules and regulations.

Those services may include — as specified by the Smart Building Alliance in its overview of 6 *Building-as-a-Service* categories : asset and facility management, energy management, space management, building security services, occupancy services and indoor and environment quality monitoring services

[www.bbri.be](http://www.bbri.be)



## Cluster eco-construction

The Eco-construction Cluster is a professional network created in 2003.

It gathers 250 members: architects, contractors, and enterprises active in the green building and renovation sector, manufacturers, green materials suppliers, enterprises active in renewable energies, research centres, training centres, high schools and universities.

It aims at promoting green building / green renovation. This concept consists in building/renovating while taking into consideration today's environment and the one of future generations while offering a maximum of comfort to the inhabitant by

- using natural materials, not harmful to humans and their environment, renewable and that consume little energy during the manufacturing process, transport, implementation and destruction or recycling,
- using building techniques that need rather labour than large quantities of energy,
- promoting smart architectural choices: integrating bioclimatic principles, ensuring a good thermal insulation of the entire building envelope, ensuring good ventilation and the thermal inertia of buildings, ...
- promoting smart energy choices: low-polluting fuels, resort to renewable energies,
- promoting the choice of smart equipment: low-energy lighting and household appliances, efficient heating and correctly sized, rational use and treatment of water.

[www.clusters.wallonie.be/ecoconstruction-en/](http://www.clusters.wallonie.be/ecoconstruction-en/)



## Cluster Cap construction

CAP Construction is a business cluster acting in the sustainable construction sector. It brings together architects, engineering offices, contractors, installers, producers & suppliers of materials and equipment, real estate developers, research and training centres, experts, inter-municipal associations and federations. It makes the cluster a place for meetings, exchanges and collaboration between the actors of the whole value chain of the construction sector.

The aim of the cluster is to foster the socio-economic development of sustainable construction in Wallonia.

CAP Construction seeks to achieve this goal via two strategic axes:

- by developing the competencies of his members,
- by encouraging the emergence of projects and new collaborations.

At the moment, the cluster focuses on 7 priority themes: energy efficiency, well-being and health & comfort, silver economy, smart building, smart district/city & eco-district, innovation & new technologies, circular economy & life cycle of materials.

The cluster holds numerous actions during the year such as events, working groups, visits, exchanges of good practices, research and innovation projects, collaborative projects, promotion of our Walloon skills abroad, fairs and exhibitions.

[www.clusters.wallonie.be/cap-construction-en/](http://www.clusters.wallonie.be/cap-construction-en/)



## Cluster TWEED

TWEED (Technology of Wallonia Energy, Environment and sustainable Development) is a wallonian Sustainable Energy Cluster that aims to play a major role in the business development of «sustainable energy» sectors.

Its first mission is to pave the way for the setting up of high quality and industrial-size projects in the fields of production and exploitation of sustainable energy, profitable enough to attract appropriate financial means.

By "Sustainable energy", TWEED covers the following areas:

- Renewable energy sources ;
- The implementation of new processes in order to achieve energy savings, energy efficiency or the reduction of greenhouse gas emissions, including CO<sub>2</sub>, at industrial level and in the tertiary sector ;
- The development of products pursuing the same goals, for industry, the tertiary sector or individuals («green» services and goods).

TWEED organizes the following services for his members and Walloon companies :

- **Networking** between industrial or commercial companies and other actors of sustainable energy sectors.
- **Reactive and proactive approaches** in order to stimulate new projects.
- **Set-up technical support** and management of projects.

- Promote **networking** by organizing specific events, general meetings, workshops, bilateral meetings, face-to-face meetings, visits to companies,...
- **Develop synergies** with other actors of sustainable energy sectors (clusters,...).
- Local and international **promotion of members**.
- Carrying out **industry, technical, market and economic studies** on sustainable energy sector.

[www.clusters.wallonie.be/tweed-en](http://www.clusters.wallonie.be/tweed-en)



## Confédération Wallonne de la construction

The Construction Confederation is the main business organisation, social partner and representative body of the construction industry in Belgium. More than 16000 contractors have joined the Construction Confederation, from craftsmen to global players, carrying out all forms of building and civil engineering activities. The Confederation informs, supports, represents and promotes Belgian contractors at the local, national and international levels. It is also an active member of the Federation of Enterprises in Belgium (FEB), the European Construction Industry Federation (FIEC), European International Contractors (EIC) and several other organisations.

[www.confederationconstruction.be/wallonie](http://www.confederationconstruction.be/wallonie)



## Agence du Numérique

The Agence du Numérique (AdN) is a public limited company under Belgian law (Société Anonyme de droit public) responsible for developing the digital sector in Wallonia. In 2015, it replaced the Agence Wallonne des Télécommunications (AWT), which had been created in 1999.

The Agence du Numérique is the public service body responsible for monitoring technological innovation and habits relating to digital technology, advising the Walloon Government and its departments on this area, and leading or coordinating operational or communication measures to support Wallonia's digital transformation by drawing on the Digital Wallonia strategy approved in December 2015.

The AdN works closely with the Walloon Government, different public service bodies and public interest organisations (Organismes d'Intérêt Public, OIP) in Wallonia, competitive clusters, federations and representatives from economic sectors; as well as all the stakeholders in Wallonia's digital ecosystem. It is also developing an extensive international network.

With the AdN, Wallonia has a public service body that is completely dedicated to Wallonia's digital transformation.

The cross-disciplinary nature of digital technology demands an independent, flexible tool that can handle the different areas affected by digital solutions. The economy, education, health, regional development, citizenship... no part of our society is untouched by the digital transformation. It is therefore essential that we dedicate a specific, long-term operational tool to the digital world itself.

[www.adn.be/en](http://www.adn.be/en)



## Digital Wallonia

The Digital Wallonia platform is a place that brings people together and shares information about the projects that make up the digital strategy together with Wallonia's latest digital news. It offers a wide range of services: sector-specific networks, ecosystems, international mission catalogue, open data, API, calendar, press review, and much more.

Digital Wallonia is all about three complementary, indivisible concepts :

- The strategy. This defines public policies' priorities and goals, as well as the support framework offered to private initiatives to promote digital technology.
- The platform. This provides services and support for public and private stakeholders involved in implementing the digital strategy.
- The brand. This unites the public and private stakeholders and initiatives launched within the context of the digital strategy and ensures their visibility.

The main goals of the digitalwallonia.be platform are to present Wallonia's digital strategy and monitor the projects launched, propose benchmark content on the technology, challenges and opportunities involved in the digital transformation, be a smart showcase for businesses in the digital sector, put together a dynamic network outlining digital habits in Wallonia (e-commerce sector, digital schools, smart cities etc.) and provide operational services to and (Agence du Numérique)'s partners and to the stakeholders involved in implementing the digital strategy (mission catalogues, digital ecosystems, shared calendar etc.).

[www.digitalwallonia.be/en](http://www.digitalwallonia.be/en)



## DSP Valley

DSP Valley is a cluster organisation in the smart digital systems domain, with offices in Leuven, Antwerp, Hasselt (BE) and Eindhoven (NL). The cluster consists of 100+ member organizations: universities, research institutes and companies, ranging from small start-ups and SMEs to large international groups with a local R&D activity.

DSP Valley nurtures digital business development, believing it vital in the face of the inevitability of digital transformations. Its *raison d'être* is twofold: *enabling new digital technologies, while simultaneously assisting those requiring them to adapt to the technologies involved.*

Collaborative business development: DSP Valley supports the creation of new value chains by identifying new opportunities and linking technology providers with integrators and product developers in the fields of Smart Health, Smart Cities, Smart Vehicles and Smart Industries.

DSP Valley offers its members a networking and matchmaking platform, allowing them to explore each other's areas of expertise and stimulating innovation by taking advantage of complementary skills, tools and objectives.

With its extensive offer of high-quality services, DSP Valley is one of the leading clusters in Europe in smart digital systems, offering support for internationalization in partnership with other top-ranking European networks.

Follow us on: [www.dspvalley.com](http://www.dspvalley.com)



## ecobuild.brussels

**ecobuild.brussels** is the cluster for sustainable construction and renovation in Brussels. It brings together companies that are active in this sector and fosters their business development.

**ecobuild.brussels** aims to develop and structure the offer in sustainable construction in the Brussels-Capital Region to help companies become more competitive and win new markets. As an actor of change, **ecobuild.brussels** focuses its action on the renovation of the building stock and on the circular aspects of construction.

To do this, ecobuild.brussels has the following missions:

- 1. CONNECT** - Bring together players in the construction sector to connect them, foster collaborations and catalyze new public or private opportunities
- 2. HIGHLIGHT** - To be the showcase of its members and the sector in order to value them and be the point of relay of their difficulties towards the clusters' partners
- 3. INSPIRE** - Organize a monitoring of innovative practices, facilitate the sharing of this practices within the sector and inspire new sustainable business models
- 4. DIRECT** - To orient companies demands towards the most competent actors and to support them in their development

[www.ecobuild.brussels/en](http://www.ecobuild.brussels/en)



## EnergyVille

EnergyVille is a collaborative scheme between Belgian research partners KU Leuven, VITO, imec and UHasselt in the fields of sustainable energy and intelligent energy systems.

EnergyVille develops technology and generates intelligence in order to support both public and private stakeholders in the transition stages towards an energy-efficient, decarbonised and sustainable urban environment.

Boasting approximately 400 researchers and operating from state-of-the-art research facilities, EnergyVille is a top-ranking European innovation hub in the field of energy transition and the sustainable built environment theme.

Located in the industry-oriented ecosystem of Thor Park (Genk, Belgium), EnergyVille offers an attractive and stimulating environment for a broad scope of energy research efforts, industrial product development and business creation.

At our unique living lab facilities on Thor Campus and beyond EnergyVille co-operates with international companies in joint research trajectories and innovation paths.

Smart and sustainable buildings and cities is one of the 6 major research domains Energyville operates in.

A large proportion of energy usage can be attributed to the urban landscape, which – in itself – poses a significant challenge to citizens, policymakers and companies alike. EnergyVille therefore works on such innovative technologies as smart district heating networks and building energy management systems.

Along that process, Energyville continually develops new insights and delivers tools and assessment methods to industry and public players so as to support them in transitioning towards an energy-efficient, low-carbon and sustainable urban environment. These tools include building and district energy modelling, building and energy technology sustainability assessment... to mention but a few.

[www.energyville.be](http://www.energyville.be)



## Flux50

Flux50 is the membership organization set to help Flanders attain international recognition as a Smart Energy Region. On transitioning towards low carbon systems, Flux50 facilitates cross-sector collaboration between the energy, IT and building industries to enhance the competitiveness of the Flemish smart energy industry.

In order to market innovative and fully-integrated energy products and services internationally, Flux50 sets up and coordinates living labs in 5 so-called innovator zones: Energy Harbors, Microgrids, Multi-energy Solutions, Energy Cloud Platforms and *Intelligent Renovation*.

Intelligent renovation projects focus on techniques both feasible within the Flemish building context and scalable to an international level. Indeed, several reports show intelligent renovation to be winning the hearts and minds of homeowners in Flanders.

Central to any refurbishment market opportunities are new business models aimed at increasing living comfort through integrated renewable energy systems — e.g. *Building-Integrated Photovoltaics* — and new smart control means for storage, distribution and consumption.

Developing cost-efficient *deep renovation packages*, setting ambitious energy efficiency targets through integrated smart energy systems, is vital to upgrade old buildings to new, energy-active ones.

A major challenge lies in the efficient integration of innovative systems able to match power supply and demand both within the building and in smart neighbourhoods with shared energy systems.

Therefore, Flux50 recently created Focus Groups in order to get a clear-cut position from energy utilities with regard to concepts like *Replicable Renovation Models*, *Positive Energy Districts* and *Local Energy Communities*. Its strategic VALORISATION members thus cooperate in drawing up a state of play on existing technologies, regulation etc. and initiate pilot projects accordingly.

[www.flux50.com](http://www.flux50.com)



## Imec City of Things

The combination of our widely acclaimed leadership in microchip technology and profound and proven expertise in software and ICT is a unique imec asset.

By leveraging our world-class infrastructure and local and global ecosystem of partners across a multitude of industries, we create groundbreaking innovation in various domains of application such as healthcare, smart cities and mobility, manufacturing and logistics, energy and education.

As part of the *City of Things* programme, imec carries out research into ways in which technology can be used to solve some of the most pressing and complex questions arising from ever-expanding and changing cities and thus to render them more liveable and future-proof.

Amid growing awareness in the public sector that technology can be put to good use in attaining policy objectives to sustainably meet social, economic and administrative challenges, the imec R&D and innovation hub is partnering with governments, the technological industry, field experts and academia to establish a series of real-life experiments with early-stage citizen involvement in broaching new ideas on designing smarter cities and testing solutions, with all privacy rights protected.

Imec's structural partners in this endeavour are the City of Antwerp and the Flemish Region.

*Imec City of Things* projects thematically revolve around:

- *Smart People*: in-depth grassroots user-research;
- *Smart Mobility*: data-driven intelligent solutions for efficient mobility of people and goods;
- *Smart Environment*: on inner city climate conditions (air quality, heat control, water management, flood prevention...)
- *Smart City Architecture*: towards a full-fledged ecosystem, compiling insights from all three areas of interest above

[www.imeccityofthings.be](http://www.imeccityofthings.be)



## Kamp C

Kamp C, the Province of Antwerp Centre for Sustainability and Innovation in Construction endeavours to accelerate transition to a sustainable society by focusing on the dual principle of sustainability and innovation in the built environment.

Vision-driven in all of its projects, Kamp C aims at ground-breaking, often disruptive innovations, pushing back the boundaries in any area of its expertise.

Circular building may still be in its inception stage in Flanders, yet Kamp C is determined to get innovative and sustainable construction off the ground, by raising awareness of circular building as such and the techniques to achieve it.

To this end, Kamp C is about to start building *the Centre*, Belgium's first ever fully circular business building. It will act as a living lab, providing invaluable insights into circular building innovation and transition.

Some other projects on building innovation and sustainability Kamp C actively involves in, include:

- 3D printing in the construction industry, a case in point being its unique concrete dwelling, 3D printed by means of Europe's largest fixed 3D-concrete-printing unit. The building envelope of the house —2-storey, 90m<sup>2</sup> surface, 8m height — has been printed on site in its entirety. A global first !
- Community-based Virtual Power Plant (CVPP): community-driven local generation and distribution of renewable energy
- Housing 4.0: research into materials and techniques towards zero-carbon construction
- Indu-Zero: digitization and automation of renovation and refurbishment projects
- Solarise: boosting solar energy adoption in public and historic buildings and by average households
- CBCI Circular Biobased Construction Industry
- ProCirc: promoting circular construction through circular tendering

[www.kampc.be](http://www.kampc.be)



## Pixii

Pixii is a neutral and fully-independent intelligence platform which pools and disseminates knowledge and guidance on good practices in carbon- neutral and circular building, with a particular focus on energy management.

Pixii participates in high-level scientific research programmes and provides training, knowhow and courses to professionals from all corners of the building industry and trade.

Our engineers and experts offer tailor-made professional advice in such specialist fields as sustainable construction, circular building, design methods and process guidance. Pixii also provides certification expertise on passive and net zero energy projects.

Across Flanders, Pixii acts as a leading partner and opinion maker for local, regional and federal authorities and the industry alike, involved in tackling future challenges along the transition from passive to entirely net zero / climate-neutral energy.

Boasting an active membership community of over 200 industry-leading companies from the construction industry, Pixii aims to be a one-stop source of inspiration and motivation for passive building and net zero energy buildings.

Pixii looks beyond the building shell in a bid to provide residents with a healthy and comfortable living environment, in which climate-neutral mobility, local on-site energy production and smart energy management through information and communication technologies and are just some of the key elements addressed.

Therefore, smart cities and smart communities are the essential corner stones underpinning its vision on sustainable architecture, urban planning and circular building.

[www.pixii.be](http://www.pixii.be)



## Smart Buildings in Use

Buildings are becoming increasingly complex structures to maintain and manage.

New technologies can help to meet the user's ever-increasing expectations while keeping under control the total lifecycle cost.

High-performance software (FMIS, BIM), integration of sensors and IoT-based interconnected technologies, new business models (DBFM, product-service systems, Integrated Workplace Management System (IWMS))... readily spring to mind here.

The *Smart Buildings in Use* cluster supports companies in digitising and optimising condition-based maintenance and building management based on intelligence derived from smart building technology.

In order to support companies in their digitisation process, the cluster fosters knowledge exchange and co-operation between companies on the subject.

To that end, it organises interactive seminars and themed workshops to promote inter-company intelligence sharing partnerships.

Moreover, by raising awareness at the end-user level, it stimulates market demand for an integrated approach to building maintenance and management.

New applications increasing a building's responsiveness, sustainability and productivity for users/occupants will be developed through open innovation.

The cluster provides companies with essential guidance with an eye to introducing concrete demo projects and innovation paths.

These efforts should result in a broader knowledge among members on digitisation of maintenance and management activities, in new innovative partnerships, and eventually in a more mature market.

The 4 main target groups addressed by the *Smart Buildings in Use* cluster are:

- contractors, active in general contracting and building maintenance;
- professional building owners and managers, facility managers, property developers;
- software providers and management and control algorithm developers;
- providers of hardware and new technologies for building supervision.

[www.smartbuildingsinuse.be](http://www.smartbuildingsinuse.be)



## Smart City Institute

The Smart City Institute (SCI) is an academic institute dedicated to the thematic of Smart Cities. It is based on an original partnership between private companies (such as Schröder, Total and Vinci Energies), a University and its Management School (HEC Liège, University of Liege) and Wallonia. This institute aims at stimulating research, teaching, innovation and entrepreneurship in the field of the “Smart City”. The SCI approaches the topic from a managerial perspective (not a technical one) while collaborating with other disciplines (necessary multidisciplinary approach).

The mission of the Smart City Institute is to “contribute to the general development of Smart Cities by training future managers, developing research, entrepreneurship and innovation as well as facilitating sustainable value creation between actors of smart ecosystems thanks to networking and thanks to an access to multidisciplinary skills and to the most innovative technologies”.

To tackle its mission, the Smart City Institute is developing three complementary activities (three pillars of the SCI) : research, teaching and innovation. These activities are supported by cross-disciplinary activities of awareness.

A real national and international perspective has been given to the activities led by the Smart City Institute since its beginning.

[www.smartcityinstitute.be](http://www.smartcityinstitute.be)



## Smart Cities Vlaanderen

An initiative of DSP Valley and the CityLab research centre for sustainable urban innovation, and solidly supported by various leading names in the tech industry, the *Smart Cities Vlaanderen* regional network was initially set up as part of the Innovative Business Network scheme (IBN). The scheme is granted financial support by the Flemish government, channelled through the Flanders Innovation and Entrepreneurship Agency (VLAIO).

The *Smart Cities Flanders* cluster was established to create a broad ecosystem consisting of companies, knowledge institutions, cities, regional authorities and citizens alike to assist them in their common objective to achieve smarter, more sustainable cities.

Within this ecosystem, the network focuses on companies actively developing products and/or services geared to meeting surging demand from cities and municipalities in their projected smart city value chains.

As recently as July 2020, CityLab and DSP Valley consolidated their mutual partnership with regard to *Smart Cities Vlaanderen*, enabling it to strengthen its role as a matchmaker between companies and local authorities.

The *Smart Cities Flanders* cluster will now operate fully embedded in the DSP Valley's organisational structure and supported by a steering committee made up delegates from the digital business community.

It will also provide a much sought-after overarching approach beyond the Flanders region in the context of digitization. Moreover, the consolidation is bound to mark the starting point for taking Flanders a notch higher on a European scale and developing it into a leading smart region in Europe.

Follow us on: [www.smartcities.vlaanderen](http://www.smartcities.vlaanderen)



## The Beacon

Innovation has the power to solve some of the major challenges we face in endeavouring to keep this world both liveable and sustainable. Yet, tackling them requires both collaboration and innovation in equal measure.

*The Beacon* is an innovation community, bringing together major tech companies, start-ups, scale-ups, research centres, corporate investors and citizens to collaborate on smart solutions intended to solve some of those urgent global challenges.

The Beacon was set up in 2018 by its founding members, the City of Antwerp, the Port of Antwerp, Antwerp University, Imec, Agoria and Lantis.

The Beacon is not your regular business centre but a full-fledged AI & IoT ecosystem for collaborative digital innovation, allowing interaction with an ever-expanding, international community.

It now boasts over 60 innovative companies, joining forces to provide digital solutions for imminent challenges to our cities, ports and industries.

Some of the areas of expertise in which The Beacon operates are smart mobility, smart port & logistics, smart Industry, but particularly smart cities and smart buildings. A case in point for the latter area is the New Work project, in which tech providers and real estate companies combined forces to test 20 digital solutions improving health, well-being and productivity aspects in the Beacon's office space.

Collaborative innovation within the Beacon is fostered in three ways:

- providing workspaces and meeting facilities for members to work share co-operatively;
- connecting community members both mutually and with outside stakeholders through matchmaking initiatives and partnering events;
- initiating joint innovation projects among participating members with an eye to it becoming a launchpad for disruptive products & solutions.

[www.thebeacon.eu](http://www.thebeacon.eu)



## Flemish Construction Confederation

The Flemish Construction Confederation is the leading business organization, accredited employers' organization and representative body of the construction industry in Flanders. Its 9,000 membership ranges from SMEs to global players in the construction business in a broad range of building, civil engineering, general contracting, and environmental engineering activities (water treatment, soil remediation, waste disposal, renewable energy...).

Construction and demolition waste (CDW) and earthworks are the largest waste stream in the EU by weight, of which the mineral content forming the biggest fraction (Eurostat, 2019). In Flanders, the sector re-uses 95% of its — meticulously traced — CDW and excavated soil.. Regulations on the matter have been in place for over 15 years, a early case in point being the *Grondbank (soil inventory)*, a tracking system for excavated soil, established by the Flemish Construction Confederation.

True to its tag line *Construction, Energy and Environment*, the Confederation has been putting its weight behind circular construction in Flanders, promoting end-to-end recycling of building materials and earthworks and ensuring the re-use of safe, secondary raw materials across the construction industry.

Some initiatives geared towards circular construction & sustainable building include the *green construction project*, encouraging the use of natural materials and construction techniques and *Tracimat*, a tracking system, allowing intensive, highly-selective CDW recycling and its re-use instead of virgin raw materials, involvement in intensive Buildings As Material Banks (BAMB) and urban mining schemes.

[www.vcb.be/international](http://www.vcb.be/international)



## Circular Flanders

Circular Flanders is the hub and source of inspiration for a circular economy in Flanders. Acting as a partnership between public authorities, the business community, civil society and the knowledge community, joint cross-sector actions are initiated in a bid to attain the ultimate objective, that of turning Flanders into a fully-fledged circular economy by 2050.

Attaining a circular economy has been set out by the Flemish Government as one of 7 transition priorities in its comprehensive policy paper "Vision 2050, a long-term strategy for Flanders".

Circular Flanders was tasked with promoting the circular economy — and circular building — as lasting transition policy priorities.

Day-to-day operations are run by the Circular Flanders team, embedded within OVAM, the Public Waste Agency of Flanders, which Circular Flanders originally sprung from and continues to be an integral part of.

Back in February 2019, in excess of 300 companies signed up to its 'Green Deal Circular Building'. Over the next 4 years all signatories will establish large-scale testing grounds, featuring demo projects and living labs, to explore innovation pathways towards circular construction, demolition techniques and regeneration of excavated soil.

At the same time, research institutes explore identified systemic barriers and opportunities which should all lead up to effective policy recommendations. In the summer of 2020, a specific subsidy call was launched by Circular Flanders for circular building projects, offering support to circular building and construction projects in tackling challenging systemic barriers. The main focus will be particularly on cities, regions and harbours as "circular metabolisms", centres of productivity, where many diverse resource cycles require full-circle closure.

[www.vlaanderen-circulair.be](http://www.vlaanderen-circulair.be)







**SUCCESS** STORIES  
IN BELGIUM



INTERVIEW WITH  
**Sebastian Moreno-Vacca, Architect and Founding Partner**

## SUSTAINABLE BUILDING SOLUTIONS

COMPANY

**A2M**

REGION

**Brussels**

Founded: 2000

Location: Brussels, Lisbon, New York

Number of employees: 35

Turnover (2019): EUR 1.6 million

Growth (2019): 7%

Investments (2019): 1 million

Start of exports: 2017-2018

Share of exports in turnover: 10%

Prizes, awards: 1 MIPIM award best future project 2018, 19 Exemplary Building awards in Belgium, 1 Construction21 Award



Since it was founded in 2000, the architectural firm A2M has set itself the goal of making our world more livable by championing quality contemporary architecture with a high environmental value. A precursor and expert in passive, sustainable, zero energy and CO<sub>2</sub>-neutral buildings, A2M undertakes large-scale architectural projects around the world and has now also opened offices in Lisbon and New York.

“Our approach to architecture has become a methodology. As a matter of fact, today, as an architecture agency, A2M exclusively designs passive building projects, including renovation. In addition, we also started integrating environmental analysis and consultancy as part of our practice a few years go,” says Sebastian Moreno-Vacca, Architect and Founding Partner of A2M.

## FUTURE-PROOF ARCHITECTURE

With natural resources becoming scarcer and weather conditions increasingly less predictable, it is the company’s strong conviction to design more robust, resilient and future-proof architectural organizations. “By reducing a building’s dependency on

*“Nowadays, passive building not only has become a standard but, rather, a necessary condition if we are to aspire to more resilient and efficient architecture and a more sustainable future”*

the external supply of electricity, water or even air, it will be able to stand and function on its own,” Moreno-Vacca asserts.

However, while self-sufficient buildings incorporate the most advanced technological systems, they are also more fragile. “Our architectural design is aimed at combining two rationales: ensuring optimal energy performance and attaining maximum robustness. This way, the buildings we design rely mainly on the physical capacities of the raw materials rather than on fallible mechanical systems”, he adds.

According to the Brussels architect, a future-proof building should therefore be capable of maintaining its living

# A2M



comfort regardless of climatic or technical variations. "Passive buildings are not only resilient and efficient as a result of their strength but also thanks to their flexibility and adaptability. We believe at A2M that future-proof architecture should be able to adapt to any change of climate, intended use or location," explains Moreno-Vacca.

## THE BRUSSELS SUCCESS MODEL

Since January 1, 2015, under the "PEB 2015" regulation in force in the Brussels-Capital Region, any new construction project as well as major renovation activities must meet passive energy standards. "At that time, nowhere else in the world has passive construction become a legal standard," says Moreno-Vacca.

Becoming the first region in the world to have a legally established passive construction standard has resulted in the urban composition of Brussels changing very quickly over the last few years. "With more than 1.5 million m<sup>2</sup> of passive buildings erected since the "PEB 2015" regulation, Brussels has achieved the most significant growth in the world," A2M's Founding Partner adds.

Thanks to the legislative framework in place in Brussels, the Passive House Regions with Renewable Energies (PassREg) platform has even qualified the Belgian capital as a front-runner in energy-efficient building and as a success model in sustainable building. "This has also enabled other cities such as New York and Vancouver to draw inspiration from Brussels' sustainable policies for their urban development," continues Moreno-Vacca.

A2M's greatest ambition would now be to bring together the sustainable

development centers of excellence of different cities in order to exchange best practices in the area. "Throughout our passive building experiences around the world, we are deeply convinced of the importance of information sharing. Creating open source international networks such as the Global Passive Building Council is definitely the right way to go," emphasizes Moreno-Vacca.

## PAVING THE WAY IN AFRICA AND THE WORLD

This Belgian sustainable architectural know-how following both an ethical and an aesthetic line is now indeed being exported abroad. "By acquiring design and construction experience abroad, we not only export our passive building expertise; we also learn to cope with different environmental and urban settings," explains Moreno-Vacca.

A2M's versatility is perfectly illustrated by the Belgian Embassy construction project in Kinshasa (Democratic Republic of the Congo), the first passive embassy in the world and the first ever passive project in Africa to be undertaken by an architectural firm. "In Kinshasa, in order to stick to our convictions, we had no other choice but to innovate and learn to cope with a different climate, a different intensity of natural light and new construction methods. Our architectural narration needed to be reviewed to suit local practices," states Moreno-Vacca.

As part of its passive construction project on the African continent, A2M actually had to reinvent itself. "Our standard design and construction criteria had to be adapted to Kinshasa's humid tropical climate while achieving minimum energy consumption, with

little or no air conditioning for example, reinstating the primacy of the material over the technology. But, in the end, these natural constraints were an opportunity for us to innovate and adjust aesthetic choices to specific technical performance," he adds.

Presenting this Belgian know-how at international architectural competitions also allowed A2M to differentiate itself from its competitors on other continents. "For example, in Arizona, we recently took charge of the design and construction of a CO<sub>2</sub>-neutral housing site and convention center. In order to stay ahead, we have decided to go even further. Not only will the site limit the impact on the environment on account of it being fully autonomous and energy and water self-sufficient, it will also be able to regenerate the environment," says Moreno-Vacca proudly.

## DESIGN A BUILDING LIKE A FOREST

In this context, the architectural agency has also won the international competition for the renovation of the ING bank headquarters in Brussels. "After renovation, the headquarters will be completely CO<sub>2</sub>-neutral and able to regenerate the environment thanks to a photocatalyst product applied to its concrete facade which will capture NO<sub>x</sub>, i.e. exhaust gases, and clean the air like a forest," declares Moreno-Vacca.

This regenerative conception of architecture gave birth to the notion of permacity (or permanent city) within A2M. "Nowadays, passive building not only has become a standard but, rather, a necessary condition if we are to aspire to more resilient and efficient architecture and a more sustainable future," he concludes.



INTERVIEW WITH  
**Francis Van Eeckhout, CEO**

## SUSTAINABLE BUILDING SOLUTIONS

COMPANY

**Deceuninck**

REGION

**Flanders**

Founded: 1937

Location: Hooglede-Gits

Number of employees: 3,500

Turnover (2019): 633,8 M €

Growth (2019): -6.0 %

Investments (2019): 35.5 M €

Export share of turnover: +90 %

Prizes, awards: Elegant – reddot award in 2019



Deceuninck creates innovative building solutions for windows and doors, outdoor and interior living, roofline and cladding. “Based on our core technology of PVC extrusion, our products contribute to a sustainable home and are designed with the lowest possible ecological footprint,” says Francis Van Eeckhout, CEO of Deceuninck.

Listed on the Euronext Brussels stock exchange, Deceuninck is the leading producer of PVC profiles in the Benelux region and one of the top three players in Europe in the industry. As a matter of fact, the company has sales operations in 92 countries in Europe, North and South America, Oceania and Asia, has production facilities in 36 countries and a 3,500+ workforce throughout the world.

### INNOVATION, SUSTAINABILITY AND RELIABILITY

Deceuninck positions itself in its market as a product innovator with a strong focus on sustainability and reliability. “Our products are not only innovative in terms of insulation,

*“Our products are not only innovative in terms of insulation, comfort and design but also in their recycling process. We simply do not launch a product that cannot be recycled.”*

comfort and design but also in their recycling process. We simply do not launch a product that cannot be recycled,” explains Van Eeckhout.

In fact, from the very beginning of its activities, Deceuninck has always recycled its own products. “In the past 10 years, we have also been recycling our customers’ waste material and more recently, we have even been recycling old window profiles from demolition sites. Today, we recycle old window profiles by using renewable energy in all our plants throughout the world,” adds Van Eeckhout.

Reliability, for its part, is reflected in the knowledge of window construction





being developed by Deceuninck towards a future-proof building environment. "Although we do not make windows as such ourselves, the name of the finished product is assigned to Deceuninck as the supplier of the profiles. Although there is more value glass than there are value profiles, customers don't talk about the glass supplier brand but, rather, about a Deceuninck window," explains the CEO.

In addition, by focusing on digitization, Deceuninck stimulates these innovations and operates shorter order and supply timings. "We are investing heavily in the digitization of the communication process with our customers, as well as our supply chain and marketing strategy. Without ecological and digital innovation, our industry will not thrive," concludes Van Eeckhout.

## RECYCLING END-OF-LIFE WINDOWS

"Because it contains chloride, PVC is still perceived unfavourably. The chloride is only released if the window burns down, which is luckily very very rare. However, PVC windows insulate twice as well as aluminum or wood during their 40-year lifetime. This means we can save twice as much CO<sub>2</sub>, increasing the energy efficiency of a building," emphasizes Van Eeckhout.

Deceuninck also gives old PVC windows a second life without emitting any CO<sub>2</sub> during the process. "PVC can be recycled up to eight times in our recycling and extrusion plant in Belgium using a dual process. First, we collect old windows, extrude the PVC,

take the impurities out, like glass for example, heat it up and get it through a mould, all without touching the molecule itself. Secondly, this recycled material replaces virgin material and can be used for extruding new PVC window profiles in our extrusion plant. This PVC recycling process is very ecological due to the low energy demand compared to aluminum; it makes PVC an outstanding product for the future."

## AN INTENSIVE DOMESTIC MARKET

Like France and the United Kingdom, Belgium started with PVC window profiles in the 70s and 80s and has a mature PVC market. "Belgium is an intensive market with demanding construction needs. But, because we play at home, we know perfectly well where to go and what to do," says Van Eeckhout. "With the knowledge we have built up in Hooglede-Gits, we would now like to expand to other areas. We will continue to increase the capacity and quality of our extrusion and recycling plants, while automating as much as possible," he continues.

## TURKEY AS THE MAIN EXPORT HUB

Deceuninck can source a lot of material within an area of 300 to 400 km of its plant in Hooglede-Gits, due to Belgium's outstanding logistic network compared to other countries. But the company also organizes its exports from Turkey. "Turkey is very efficient in the area logistics and offers flexible management options. The combination of their capacity model and their labor

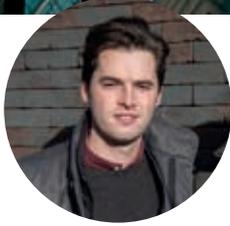
market makes Turkey a good export hub," comments Van Eeckhout.

Turkey is particularly interesting for Deceuninck because of the considerable importance of its labor market. "In extrusion, a normal window is made of seven or eight moulds. Two moulds are high runners for which labor costs are not important. But five shapes are short runners, which are expensive and account for only 5 to 20% of the total window market. We extrude only a couple of hours or days per year on these types of shapes. Otherwise, labor costs would be too high," he explains.

## ENVIRONMENT AND HUMAN HEALTH

Deceuninck sees the COVID-19 pandemic as an opportunity for a greener environment. "Homeworking is one of our policies. We will reduce the number of cars and introduce a mobility plan in order to opt for a greener alternative. We see it as a win-win-win-story. It must be a win for the employee, a win for the company and a win for the world as a whole. It will only be durable if everyone can benefit from it," adds van Eeckhout.

"The whole sustainability story is easy if you do not ask a commitment of change. If you want an electric car for example, you need to stop every 100 or 200 km to recharge the car. At that moment, it becomes difficult because we do not want to change our behavior," he continues. "I deeply believe we can use the COVID-19-crisis to change our attitudes to the world and make the best of it," Van Eeckhout concludes.



INTERVIEW WITH

**Patrick Vandenbempt & Jasper Vandenbempt**, founders & owners

## SUSTAINABLE BUILDING SOLUTIONS

COMPANY

**Facadeclick**

REGION

**Flanders**

Founded: 2015

Location: Leuven

Number of employees: 2

Website: [www.facadeclick.be](http://www.facadeclick.be)



Following an environmentally circular building approach, the Leuven-based company Facadeclick has developed a patented solution to construct brick façades. "Without using mortar or glue, our dry building system makes it possible to build a jointless façade quickly by clicking bricks onto inserts. With these inserts, the bricks can be easily connected and disconnected," explains Patrick Vandenbempt, inventor of the innovative solution and founder and co-owner of the company.

### BUILDING REFERENCES

Today, Facadeclick installs and licenses out its technology worldwide. "We first had to demonstrate that our product met the challenging expectations. Five years ago, we started our journey in Belgium with a brick producer (Nelissen) and a connector producer (Didak) who were willing to manufacture the Facadeclick elements for us," explains Vandenbempt. "In the meantime, we have fine-tuned our technology and installation process and installed over 10,000 m<sup>2</sup> of houses in Belgium and

*"It remains our strategy to sell directly to building sites locally and to license out our Facadeclick technology in the rest of the world."*

the Netherlands," he continues. Obtaining building references means that other building companies start recognizing all benefits of the Facadeclick solution. "In the Netherlands, the brick producers we work with know all the local building companies and project developers and they confirm that our system is circular, fast and easy to install, in virtually any weather conditions," says Vandenbempt.

Furthermore, Facadeclick has concluded a cooperation agreement with Unilin to license out its technology worldwide. "As a result of this cooperation, some of the biggest construction companies are now testing Facadeclick. It remains our strategy to sell directly to building





sites locally and to license out our Facadeclick technology in the rest of the world,” emphasizes Vandenbempt.

## AN EMOTIONAL SKIN

Facadeclick’s goal is to offer every color, every size and every type of brick that exists in traditional masonry work. “That was one of the issues when we started. We came with a new product, but just one type of brick and a very small range of colors. In addition, we realize that bricks are the emotional skin of a house so it is important to pay attention to design,” explains Vandenbempt.

For its current projects in the Netherlands, Facadeclick works with Nelissen bricks and Didak inserts. The same applies for bricks and inserts destined for the United Kingdom. “However, we cannot rely solely on Belgian suppliers for our future orders to the Netherlands, the United Kingdom or even other European countries. Didak will be able to supply inserts to a large part of Europe on account of it being a lightweight product. However, it is more difficult for bricks because they have an emotional value and you need to have the same colors at your disposal as in traditional brickwork,” adds Vandenbempt.

## MATERIALS BANK

A lifecycle analysis conducted by Facadeclick in collaboration with the University of Brussels suggested that

bricks and inserts can be reused at least three times. “We adopt a future-proof way of building and stock our building material in the same way as in a materials bank. If we get word that a house will be demolished, we can reuse this material to build a new house or just stock the material for the future. Eventually, there will also be a brick inventory for every type of house,” comments Vandenbempt.

The company believes that its customers need to be able to make the deliberate choice to remove the skin of a building for insulation or design purposes. “We recently built a shop for a supermarket chain with Facadeclick. Six months later however, they decided to use another brick color and asked us to remove the skin of the building which can easily be done with Facadeclick,” he adds.

## SUSTAINABLE AND AFFORDABLE

Working with Facadeclick is also cheaper than with traditional building materials. “If a product is more circular than traditional building materials but at a higher price, it would never gain market share.

*“We adopt a future-proof way of building and stock our building material in the same way as in a materials bank.”*

Moreover, thanks to the ease of installing in any weather and the low-level training required of workers, we can build between 12 and 15 m<sup>2</sup> a day with Facadeclick instead of 5 m<sup>2</sup> a day in the traditional way. Besides it is becoming increasingly difficult for building companies and project developers to find enough trained people to work on site. All of these reasons explain why we are 20 to 25% cheaper than traditional building techniques,” says Vandenbempt proudly.

## A CIRCULAR FUTURE

Although it is difficult to build, jointless brickwork is becoming more and more popular in Belgium and Europe. “In Belgium, jointless brickwork accounts for more than 60% of the enquiries coming from architects. With Facadeclick we can address this demand,” Vandenbempt explains.

In the future, according to the Green Deal, all European countries will have to build with construction products that have an Environmental Product Declaration (EPD). This means that every brick factory will be able to offer a sustainable solution and that the products used to build the houses of the future will be environmentally sound throughout their entire lifecycle. “Facadeclick is the first product in Belgium certified by an EPD. We are ready for this rule change and we believe that Facadeclick is the right partner in building a circular future,” concludes Vandenbempt.



INTERVIEW WITH  
**Olivier Beghin**, *Managing Director and Co-Founder*

## SUSTAINABLE BUILDING SOLUTIONS

COMPANY

# ISOHEMP

REGION

## Wallonia

Founded: 2012

Location: Fernelmont, Belgium

Number of employees: 25

Growth (2019): 30%

Investments (2019): EUR 7 million

Start of exports: 2015

Share of exports in turnover: 35%

Prizes, awards: Solar Impulse Efficient Solution Label



Located in the Namur region, IsoHemp is an industrial manufacturer of sustainable products made of hemp for the construction and renovation sector. "Our sustainable and efficient hemp insulation solutions can be used for residential, commercial and industrial buildings," says Olivier Beghin, Managing Director and Co-Founder of IsoHemp.

Today, IsoHemp primarily focuses on producing hemp blocks made of hempcrete, a contraction of the words hemp and concrete. "By using 100% natural materials that are sourced locally, our ambition is to establish an environmentally responsible construction and renovation model that promotes sustainable development," Beghin adds.

### HEMP BLOCKS AND HEMPCRETE

Hemp blocks are a non-load-bearing masonry product manufactured in four steps that require specific technical know-how mastered by IsoHemp over the years. "First of all, in order to minimize its carbon footprint, the company mainly turns to local suppliers for its raw materials

*"By using 100% natural materials that are sourced locally, our ambition is to establish an environmentally responsible construction and renovation model that promotes sustainable development."*

(hemp, lime and water). Precise doses of these are then mixed together," Beghin explains.

The hemp mixture is subsequently molded into a block thanks to a special press that creates different ranges of blocks between 7.5 and 36 centimeters wide. "Once the blocks are out of their mold, they are stored temporarily to allow them to dry and harden. This process requires no energy consumption because it occurs in the open air," Beghin continues.

Finally, once the blocks are dry enough to be handled, they are palletized and go through a second six to ten week





open-air drying period depending on the width of the blocks produced. Once this period is over, the pallet can be shipped to a construction site. "Our production plant can currently manufacture more than one million hempcrete blocks per year and has 4,000 pallets of stock ready at all times," says Beghin.

## VERSATILE ADVANTAGES

Designed for the production of insulating envelopes, partition walls and counter partitions, hemp blocks offer many unique advantages. "First of all, hemp blocks meet the strictest requirements in terms of sustainable development and are perfect for low-energy and passive building projects. Furthermore, as an extraordinary insulating agent, our hemp products naturally also increase the water permeability of a building," he adds.

Thanks to their outstanding ability to diffuse accumulated heat, hemp blocks also naturally regulate the temperature of a building. "Our insulation solutions can be used for thermal regulation purposes. In fact, our hemp blocks serve as real thermal buffers by maintaining a constant indoor temperature both in winter and in summer," Beghin explains.

In addition, using IsoHemp hemp blocks for a building's walls or interior partitions, external and ambient significantly reduces noise. "Our hemp blocks are excellent acoustic insulators that help to dampen sound waves and protect occupants from noise pollution," Beghin states. Finally, although this may be surprising, hemp blocks are particularly resistant to fire. "Coated hemp blocks have the highest European fire resistance rating (A1) and can withstand fire for



more than two hours," the company's Co-Founder declares.

## INFINITE APPLICATIONS

All of these qualities make hempcrete blocks a suitable product for limitless construction projects and any types of building system. "Opting to build with hempcrete blocks according to any building system is the guarantee of a simple, affordable and comfortable project, whether it is a residential, real estate development or social housing project," affirms Beghin.

Hemp blocks can be used to make the insulation envelopes for all wooden building systems, whether in timber framework, lightweight frame or cross-laminated timber (CLT). "True allies of the comfort of wooden houses, hemp blocks compensate for their low thermal inertia by storing and redistributing heat during temperature variations," Beghin explains.

IsoHemp's products can also help in building a house with a beam-column structure, whether made of wood, steel or concrete, while guaranteeing maximum comfort and high energy efficiency. "Hemp blocks and column-beam structures create the perfect combination of rapid construction of the building frame with insulating blocks providing great thermal inertia for the building envelope," he continues.

*"Thanks to our uniqueness and the high quality of our products, we can now tackle the European and world markets."*



For their part, buildings with load-bearing masonry (concrete blocks, terracotta, cellular concrete, etc.) need to be doubled with additional insulation to achieve high energy performance. According to Beghin, "doubling load-bearing masonries with hemp blocks makes it possible to create a second insulating envelope for the building and ensure the durability of the insulation over time."

Lastly, thanks to IsoHemp's wide range of hempcrete blocks in various thicknesses, both interior and exterior renovation projects can be tackled by the company. "The most energy-efficient insulation is exterior insulation for which we apply a global thermal envelope made of hemp blocks all around a building. However, sometimes the exterior facades cannot be modified because the aesthetic character of the house needs to be preserved or due to a lack of space. Renovating the building from the inside is then an effective solution," asserts Beghin.

## CONQUERING THE BELGIAN AND WORLD MARKETS

IsoHemp is one of the few European companies to provide quality hemp-based products to its customers. "We are the only company of its kind in Belgium and have a very few competitors in Europe. Thanks to our uniqueness and the high quality of our products, we can therefore now tackle the European and world markets via a large distribution network. The development of green building systems and of our company is just beginning. I am firmly convinced that we have a bright future," concludes Beghin.



INTERVIEW WITH  
**Laurent Riche, CEO**

SUSTAINABLE BUILDING SOLUTIONS

COMPANY

**Stabilame**

REGION

**Wallonia**

Founded: 1989

Location: Mariembourg, Province of Namur, Belgium

Number of employees: 130

Turnover (2019): EUR 13 million

Growth (2019): 15 %

Investments (2019): EUR 0.36 million

Start of exports: 1992

Share of exports in turnover: 13%

Prizes, awards:

- 2019 – Green solutions awards 2019, local wooden cyclo-pedestrian footbridge (26 m long x 9 m wide x 12 m high)
- 2018 – Profilwood: innovation with local CLT wood building system
- 2018 – Bati C<sup>2</sup>: innovation with bio-based materials in wood building system
- 2018 – Golden Fiber: innovation with curved CLT in local wood
- 2018 – Made Different Digital Wallonia, Ambassador, “smart solutions” category
- 2018 – Digital Construction Genius of the Year, La Chronique
- 2018 – BIM Award, category SME, tertiary, industrial, residential and commercial sectors



Created in 1989, the Namur-based company Stabilame is a family business that is part of the Riche Group. Specializing in timber construction and wood recycling, the Group comprises three complementary companies: Stabilame, the central focus of the present article, an expert in the design and construction of wooden buildings; Menuiserie Riche for exterior carpentry work; and Eneerco Bois for the recovery of production waste into wood fuels.

Today, Stabilame offers its customers, mainly real estate developers and architects, technical mastery and know-how in the field of wood construction that are unique in Belgium. “Our in-house manufacturing design office and production workshops enable us to control the entire wood production chain, from the design of a construction project, working with local raw timber, producing wood-based products to the final assembly of the wooden building,” explains Laurent Riche, CEO of Stabilame.

**KNOCK ON LOCAL WOOD**

In order to encourage rural and local economies and minimize its

*“Our in-house manufacturing design office and production workshops enable us to control the entire wood production chain.”*

environmental impact, the Walloon company favors working with local wood integrated within short environmentally friendly circuits. This way, as a PEFC certified company, Stabilame only uses wood from sustainably and responsibly managed forests. “The majority of the wood used for our clients’ projects comes from local forests located within a radius of 300 km around our production workshops in Mariembourg,” specifies Laurent Riche.

In addition, bio-based wood, as opposed to other building materials, remains the only fully renewable material that can offer a multitude of technical possibilities when transformed for construction. “Being both very solid and flexible, wood is an excellent building material that enables made-to-measure structures to be developed according to various construction techniques,” explains Laurent Riche.



## MASTERING ALL THE CONSTRUCTION SYSTEMS

Today, five timber construction systems dominate the wood market and, rather than choosing one, Stabilame made the deliberate choice to master them all in order to respond to the most diverse and demanding requests from its customers. "We are the only timber construction company in Belgium that has developed recognized expertise in all the construction systems that exist on the market, offering a global approach to specific construction projects," states Laurent Riche.

"The most widespread system in the world is the timber frame, a skeleton made up of herringboned uprights and frames that are connected to each other, presenting particular advantages in terms of stability. For its part, the stacked-board or log house construction system offers the most natural finish possible thanks to its wood-on-wood assemblies but is less widespread due to existing thermal requirements. Thirdly, the post and beam construction system is an excellent insulator and displays particularly interesting thermal performance properties as well as large open spaces," explains Laurent Riche.

"The two last construction systems are based on cross-laminated timber (CLT). With an almost zero environmental impact, nailed CLT is the eco-friendliest and most successful construction system on the market whereas glued CLT makes monolithic walls and floors in solid

wood, made up of a succession of boards glued to each other," he continues.

More importantly, depending on the aesthetic, ecological or economic preferences of its customers, Stabilame is able to combine these different construction systems in a flexible way. "Our uniqueness also lies in our ability to combine these five construction systems in order to offer the best solutions for our clients' projects. In a way, you could say that we are a manufacturer who thinks like a craftsman," declares Laurent Riche.

## SMART WOOD

In recent years, the timber construction sector in Belgium has become extremely digital and automated from a design and production point of view. "In order to gain a foothold in a market dominated by concrete, wood has had no other choice but to follow the digital path," says Laurent Riche.

To this end, Stabilame has facilitated its design, production and (de) construction processes thanks to the digitization and 3D modeling of timber construction projects with close to Building Information Modeling (BIM) software programs. "Our nearly BIM software enables us to centralize all the information about a construction project in a computerized way and to facilitate the communication flows and the sharing of insights with our customers," explains Laurent Riche.

Finally, the digitization of processes also plays an important role in reducing wood waste, reusing timber

material and recovering wood as by-products, and in upcycling wooden buildings. "Wood structures are extremely malleable in the sense that they can easily be carved multiple times, even on site, to give the material a second life. Even when the reuse of existing timber parts is not possible, wood can easily be recycled, either for the manufacture of other wood products or, at the very end of its life cycle, into fuel," he continues.

## A UNIVERSAL LANGUAGE

BIM software – or nearly BIM – and other digital methodologies for sharing information relating to the design of a building have also enabled Stabilame to conquer foreign markets from Belgium. For example, the Mariembourg company recently undertook several construction projects in Canada. "3D design and digital architectural drawing is a universal language that allows us to make our technical expertise available to customers anywhere in the world without any geographical restrictions," says Laurent Riche.

According to the CEO of Stabilame, it might even be possible in the future for the company to open production workshops abroad which would be managed remotely from Belgium using BIM programs or similar technologies. "However, the most important thing for us remains being able to offer comprehensive and complex technical solutions for our clients' projects and to seize the opportunities that may arise in Belgium and abroad. Our boldness is our hallmark," concludes Laurent Riche.



INTERVIEW WITH **Sunita Van Heers**, Managing Director and Founder

SUSTAINABLE BUILDING SOLUTIONS

COMPANY

SuReal

REGION

Brussels

Founded: 2019

Location: Brussels

Number of employees: 10 (2020)

Turnover (2019): EUR 0.5 million

Growth (2019): 50% monthly growth

Investments (2019): 20% of turnover

Start of exports: 2019

Share of exports in turnover: 5%



Standing for Sustainable Real Estate, SuReal is a Brussels consultancy firm that supports companies and government agencies in making buildings and city projects more sustainable whilst keeping in mind the well-being of its occupants.

"As independent sustainability experts, we help architects, real estate developers, as well as public and private clients to build a future-proof environment through co-creation projects," states Sunita Van Heers, Managing Director and Founder of SuReal.

"With a vast array of services such as studies, certification and project guidance in multiple sustainability management fields (such as water, electricity and waste), our engineers provide sustainability advice and support from concept to delivery while guaranteeing integrated and efficient results," she adds.

INTEGRATED SUSTAINABILITY

As an independent sustainability manager, SuReal strongly believes in an integrated approach to sustainability. "When providing integrated sustainability consultancy in real estate, we adopt a holistic view and a broad vision of sustainability. This

*"Sustainability is a philosophy of life and is by definition not limited by physical boundaries."*

means that, based on our expertise and in-depth independent studies, all possible aspects of sustainability will be interconnected to ensure that they reinforce each other and create the highest possible environmental value for a project," Van Heers explains.

In addition, when it comes to integrated sustainability, it is imperative to bear several topics in mind, according to the founder of SuReal. "First, an energy-efficient project should always nurture a CO<sub>2</sub>-neutral ambition and put in place low carbon solutions in accordance with the economic feasibility of a project," says Van Heers. "Secondly, a sustainable building project should always ensure the health and well-being of all its occupants by paying particular attention to air quality, visual comfort, acoustic comfort and biophilia, amongst other things," she continues.

Circular economy is also an integral part of SuReal's integrated sustainable construction projects "because it increases the ecological flexibility and adaptability of a building and gives





used building materials a second life". Lastly, "the design of a building can also enhance the environmental quality of a project by taking advantage of site-specific features such as wind, sunlight, water, and soil," Van Heers adds.

## FULL-SCOPE STUDIES

Because its sustainable vision and solutions need strong foundations, SuReal provides detailed data and project-specific studies at the request of its clients in order to help them to make the most appropriate and energy-efficient construction decisions. "Our no-nonsense approach towards a sustainable future involves the conducting of studies, such as comfort simulation studies, urban studies, material studies and technical feasibility studies," declares Van Heers.

SuReal's comfort simulation studies are directed towards optimizing the indoor comfort of a building. "This way, we can improve the daylight and sunlight comfort, indoor air quality and thermal comfort of a building, which are all quintessential for the well-being of its occupants. Our urban studies, for their part, help to measure the impact of the constructed environment on a building with the goal of integrating natural elements such as water, sun, or wind in construction project," she continues.

In order to make well-founded design choices as well as appropriate material choices, SuReal also conducts material studies and offers its customers detailed Life Cycle Assessments (LCA). Lastly, because a sustainable project must also be technically and economically feasible, SuReal also carries out custom-made technical feasibility studies on master-plan, building or elemental levels. "In the end, what matters most when



conducting these studies is that our sustainability vision becomes stronger when it is backed up by tangible proof and quantifiable data," adds Van Heers.

## SUSTAINABILITY CERTIFICATES

In order to add value to specific projects, the company can also issue sustainability certifications, both nationally and internationally, for buildings or neighborhoods that are designed according to a sustainable rationale. "At international level, SuReal can deliver both BREEAM (Building Research Establishment Environmental Assessment Method) and WELL certification. Whereas the former assesses the overall sustainability of a building, the later measures the impact of a building's operational aspects on human health and well-being," explains Van Heers.

At the domestic level, SuReal can inform owners and tenants of a property about its energy performance by delivering EPB/PEB certificates as well as other Belgian sustainability assessment documents. "But, ultimately, defining the most appropriate rating of a building and delivering the appropriate certificate for a building is not an aim in itself. What is most important is to enhance the environmental value of our projects

*"Because our international clients and partners value our expertise and regard Belgian architects and engineers as frontrunners in their fields, we are viewed as real estate sustainability rock stars abroad."*



and the certificates will then follow as a natural result of our work," says Van Heers.

## A VISION WITHOUT BORDERS

As a young scale-up, the majority of SuReal's projects are carried out in the BENELUX region, although the company's engineers have also worked in other countries within and outside of Europe. "Sustainability is a philosophy of life and is by definition not limited by physical boundaries," says Van Heers.

In this way, the Brussels-based company has provided its expertise both within and beyond the borders of Belgium. "At national level, we recently provided sustainable advice to various construction projects such as the 60,000 m<sup>2</sup> warehouses of the Belgian chocolate manufacturer Barry Callebaut in Lokeren and the Maritime Campus Antwerp (MCA), a 100,000 m<sup>2</sup> center that aims to bring different private maritime players, government authorities and educational institutions together in one location in order to find innovative answers to the maritime challenges of tomorrow," Van Heers affirms.

Internationally, SuReal has provided its sustainable expertise to the Belgian Olympic and Interfederal Committee (BOIC) for setting up the Belgium House in Tokyo during the 2020 Olympics. "Unfortunately, this project had to be postponed to next year due to the global health crisis," says Van Heers. "In the end, because our international clients and partners value our expertise and regard Belgian architects and engineers as frontrunners in their fields, we are viewed as real estate sustainability rock stars abroad," concludes Van Heers.



INTERVIEW WITH  
**Alexander Van Wijnsberghe, CEO**

## SMART CITIES

COMPANY

**APTUS**

REGION

**Flanders**

Founded: 2015

Location: Bissegem

Number of employees: 18

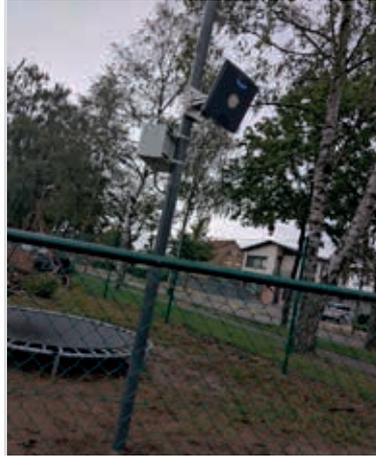
Turnover (2019): EUR 1.8 million

Growth (2019): 3-4 employees per year

Investments (2019): 1.5 employees conducting R&D full-time

Prizes, awards: Designregio Kortrijk Award for the High-Five solution in 2019

Website: [www.aptus.be](http://www.aptus.be)



Aptus is a smart technology company with expertise ranging from hardware to software, from data to insights. "We use smart technology such as sensors, devices and electronics. We position these physical devices in the field to capture data and then transform that data into insights using our software. Our goal is to bridge the physical and digital world and to know as much as possible about what is happening around us," says Alexander Vanwijnsberghe, CEO of Aptus.

Aptus approaches the market in three different domains: projects, products and services. "As of today, 70% of our revenue comes from very diverse projects. Our product business is more geared to the smart city market niche. In fact, cities are looking for proven smart solutions and technology rather than single projects. Apart from that, we mainly offer platform engineering services," adds the CEO.

This was the method applied by the company to implement an open smart city architecture for the city of Knokke-Heist. As Vanwijnsberghe explains, "The platform is capable of collecting data from any technology device installed in the streets and presenting it in a dashboard in order to provide a

*"Technology is not rocket-science anymore, you can measure whatever you want with technology. The real added-value is in providing valuable insights on using this technology."*

'city cockpit'. Knowing the filling level of a waste bin, for example, will only be relevant if you integrate this information with smart services to empty the bin and optimize the process. In other words, you need to build something that is specific to the application. Technology is not rocket-science anymore, you can measure whatever you want with technology. The real added-value is in providing valuable insights on using this technology."

## TECHNOLOGY IMPACTING SOCIETY

Aptus' mission is to provide technology that has an impact on society. As such, the company developed a solution called High-Five. "High-Five is an end-to-end solution that we built to

encourage children to walk or cycle to school rather than going by car. This technology is already up and running in the streets of cities such as Harelbeke, Wevelgem, Houthulst and Genk. Children wear an NFC chip integrated wristband and, when they approach the High-Five pole and give it a high five, we reward them with points for passing by. Children who come to school by bicycle are scanned automatically at the school gate using an RFID-reader.” clarifies Vanwynsberghe. The High-Five project is just at the start of its success, according to the CEO. “We have just entered into a framework agreement with the West Flemish intermunicipal company. As of January 1, 2021, all the cities of West Flanders can use this framework to buy and implement the High-Five solution, which also matches five Sustainable Development Goals. With the High-Five solution, our technology therefore also has a positive impact on society, taking cars off the road and thus creating healthier and safer school environments and so on,” he continues.

## BELGIUM, PAVING THE WAY FOR SMART CITIES

According to the CEO, Belgium has many assets in the field of smart cities compared to other countries. “Expertise centers like the VLOCA initiatives (Flemish Open City Architecture) or Smart Cities Flanders have a lot of R&D capacity and state-of-the-art knowledge. Moreover, high schools and universities are offering new education programs related to the Internet of Things and AI. Education in Belgium is following the same trends as the business world with students bringing valuable knowledge and expertise into companies. In addition, there are some funding channels such as VLAIO available that can be

interesting for companies. Last but not least, cities in Belgium are very close to one another. Being interconnected allows them to launch common initiatives and build smart urban platforms together.”

## INTERNATIONAL EXPANSION

The next step for Aptus is to expand internationally. “We are thinking about the best way to conduct international business: do we need to send somebody from Belgium abroad or rather rely on a local partner who can help us in accessing a foreign market? It is a difficult choice. Sometimes physical actions are required with technology so doing everything remotely will not work,” Vanwynsberghe says.

The company is now actively prospecting the Dutch market with its High-Five solution. “All parts of our software, such as our gamification techniques, are currently being screened because in the Netherlands added value in solutions requires proof and evidence,” he explains.

Aptus also employs a salesperson to sell its MobiCount solution that collects traffic data. “There is a lot of interest from the Scandinavian countries, which struggle with a lot of mobility issues. Interest is also being shown from Ireland. For this smart city solution, we sell and ship the hardware and deliver a software platform to our foreign clients to enable them to manage the data themselves.”

## JUST DO IT

Aptus is constantly looking for new products, new services and new opportunities. “There is a lot of potential in smart cities and we try to fill the gap where we see a need. The



first thing to do is to talk to cities, pitch your potential solution and see how they feel about it. It is not always about developing technology and selling it. Sometimes it is better to get to know the market and see if the solution that you could potentially build would be a market fit,” explains Vanwynsberghe.

According to the company’s CEO, there is a lot of talking about smart cities and maybe too many white papers and studies on the topic. “Our mission is plain and simple: just do it and make things happen. We want to have a societal impact by making a city smart one step at a time,” states Vanwynsberghe.

Aptus believes that mobility and sustainability will be hot-button topics in the coming years, especially following the COVID-19 pandemic. Together with a company called Creaplan, Aptus has built a solution called Heat Display which measures the temperature of everyone entering a building. “We built our first prototype and installed it on the customer’s premises in just three days. When we see an opportunity, we go for it and we build it. That is one of our strengths, we can let customers feel how technology could help them and deliver a solution very rapidly,” concludes Vanwynsberghe.



INTERVIEW WITH  
**Guillaume Kerckhofs, Founder**

## SMART CITIES

COMPANY

**Bike & Win**

REGION

**Wallonia**

Founded: 2019

Location: Liège

Number of employees: 1

Start of exports: 2019



The young Liège-based company Bike & Win has developed an application for both iOS and Android devices to promote cycling as a mobility solution, to improve people's health and to protect the planet. "With its awareness of climate change and urban mobility challenges, our company started from a statement," explains Guillaume Kerckhofs, Founder of Bike & Win.

As a matter of fact, because the place of the car is retreating inexorably in urban traffic, more and more people are choosing bicycles to commute. "With our entirely free mobile application, we want to encourage people to use bicycles as a healthy, sustainable and responsible means of transport and reach out to people that would still be reluctant to use them," he continues.

## PUTTING FUN INTO CYCLING

The Bike & Win application has been developed precisely to encourage regular use of the bicycle through fun processes and challenges. "Our ultimate ambition is to stimulate the use of bikes – not necessarily the use of our app – and to encourage a mental shift towards a modern way of getting

*"Our ultimate ambition is to stimulate the use of bikes – not necessarily the use of our app – and to encourage a mental shift towards a modern way of getting around in the city through playfulness and rewards."*

around in the city through playfulness and rewards," says Kerckhofs.

In this way, the Bike & Win application allows its users to participate in short, medium and long-term challenges, which can be taken up alone or in team. "Alone or in team, users of the application receive challenges within their reach with the objective, for example, of driving a certain number of kilometers within a determined period of time. If the user(s) pass(es) the challenge, he/she/they could earn a reward such as cinema or concert tickets, discount coupons, or even a week-end abroad," adds Kerckhofs.

However, the aim of the application is





not for its users to compete in a race against each other but, rather, to take up personal challenges that stimulate an alternative form of mobility over the long term. "The Bike & Win app is not intended for athletes. In fact, in order to win a challenge, a limit is very often set on the number of kilometers that can be covered per day. If, for example, the target is to cycle 200 km within 30 days, a user may be limited to a maximum of 10 km per day in this challenge in order to promote the daily use of bicycles. A random draw among the users who successfully completed the challenge will then determine who wins the reward," explains Kerckhofs further.

## A DARING BUSINESS MODEL

While the application is completely free to download and use, the challenges are created at a reasonable price by private companies or municipal authorities. "We proactively reach out to city authorities for them to stimulate cycling on their territory by creating challenges on our application. Private companies can also create challenges to encourage the use of bicycles by their employees or promote a product to all the users of our platform," says Kerckhofs.

The Bike & Win application therefore not only promotes commuting by bicycle in a region but also a company's services. "On the one hand, the application is the ideal solution to connect with local urban communities (potential users) and develop their specific urban territory in a sustainable way. On the other hand, by engaging with the app community (regular

users), a company can promote its products and solutions as rewards to challenges it has itself created," adds Kerckhofs.

One of the biggest advantages of the Bike & Win business model is that no disproportionate funding is needed to promote it by virtue of it being directly dependent on the creation of challenges by private companies or local government bodies. "By organizing challenges and reaching out to their communities, local governments and companies attract new users to our app. In other words, the organizers of the challenges themselves feed our solution and spread the word about it," explains Kerckhofs.

## BICYCLE TOURISM

According to the Founder of Bike & Win, cycling is not only the future of urban mobility but for tourism as well. "The application is the ideal tool to promote a region to a large community of potential cycling tourists. In this way, everyday cyclists could be riding for several weeks or even months to win a stay in a dream tourist destination," says Kerckhofs enthusiastically. "French cycling areas (such as the Mont Ventoux region) could organize cycling challenges in

*"During international Smart Cities fairs abroad, we notice that there is enormous interest in the solutions we offer."*

Paris, for example, to win a weekend stay and attract its target audience through our app," he adds.

In addition, the Liège-based company is currently negotiating with investors to raise funds in order to increase its capital and expand its offering. "Relying on more financial resources will allow us, among other things, to translate the application into several languages such as German and reach potential cycle tourists beyond the French-speaking world," the company founder believes.

In pursuing these bicycle tourism and promotion objectives, Bike & Win is now also targeting foreign markets according to a pro-active strategy. "During international Smart Cities fairs abroad, in Lisbon and Barcelona in particular, we notice that there is enormous interest in the solutions we offer. Our priority now is to address the French market and develop our solutions there," says Kerckhofs.

## RIDE FOR CLIMATE

In order to combat climate change, the efforts to reduce our ecological footprint must be collective and individual. This is why, each time one of its users rides a bike, the app calculates the number of kilograms of CO<sub>2</sub> saved. "No matter where they are, we record the kilograms of CO<sub>2</sub> saved by all our users in real-time on an online counter. On the Bike & Win app, our community can also organize for free a "Ride for Climate" challenge in which you have to ride 2,500 km within 6 months in order to save 350 kg of CO<sub>2</sub>! Because small streams make big rivers," concludes Kerckhofs.



INTERVIEW WITH  
**Angelo Santoro, CEO and Founder**

SMART CITIES

COMPANY

**ENERGIS**

REGION

Wallonia

Founded: 2017

Location: Louvain-la-Neuve and Brussels (Belgium), Caserta (Italy)

Number of employees: 20

Turnover (2019): global revenues + EUR 1 million

Growth (2019): +450%

Investments (2019): + EUR 1 million/year

Start of exports: 2017

Share of exports in turnover: +80%



The Brussels and Louvain-la-Neuve-based company Energis provides smart energy management solutions to organizations specializing in the provision of energy optimization services, such as Energy Service Companies (ESCO), Public Utility Companies, and Facility Management Companies as well as companies in charge of producing energy from renewable sources that require constant monitoring of their installations and operations, such as large photovoltaic (PV) operators or cogeneration companies.

These companies and organizations use Energis' technological solutions to manage large portfolios of tertiary buildings (commercial buildings, public administration buildings, hotels, etc.) and industrial sites. "Our solutions have been developed with the ambition to facilitate the work of energy experts, facility and CSR managers in their daily activities and, ultimately, to reduce energy consumption by 5% to 15%," says Angelo Santoro, CEO and Founder of Energis.

**ENERGIS.CLOUD**

Energis has developed an innovative digital Energy Management Platform called Energis.Cloud that centralizes all energy-related data coming from

*"Foreign markets now account for 80% of Energis' turnover"*

several sources (meters, sensors, building management systems, etc.) in a single cloud big-data application. "All this data is continuously analyzed by AI-based algorithms to identify anomalies and energy waste, measure improvements, forecast consumption or production, alert experts and eventually automatically send commands to stop energy waste and keep energy costs under control," explains Santoro.

"Energis.Cloud's originality lies in its three distinctive features," affirms Santoro. "First of all, our platform is highly customizable and one of the most flexible on the market in the sense that it can be adapted to several market segments (tertiary buildings, industries, renewable energy providers) and to several types of users (occupants, experts, facility managers). In this way, Energis.Cloud is customized according to the customer's needs, e.g. by creating personalized KPIs, by designing customer-specific dashboards and reports or by configuring personalized data analysis algorithms," Santoro adds.





"Secondly, once it is configured, our tailor-made solution is deployed rapidly in order to address specific energy monitoring needs. Thirdly and lastly, our energy management platform is one of the few solutions on the market designed to follow and manage Energy Performance Contracts (EPCs), allowing accurate calculation of savings generated by energy efficiency actions," Santoro continues.

## RASPICY DATA LOGGER, THE THERMOSTAT 4.0

As a data-driven application, Energis.cloud collects and centralizes data directly from any hardware (meters, sensors, and any other IoT devices) or from utility invoices thanks to its sophisticated digitization algorithms. "Sometimes, however, data cannot be collected easily from existing hardware in under-equipped buildings. This is why Energis developed its own hardware: a data logger named Raspicy," explains Santoro. "In any given building, meters and sensors can be connected to a local Raspicy data logger that collects and centralizes energy-related information on the Energis.Cloud platform".

The Raspicy data logger also has another interesting feature: it can send remote commands to hardware devices and automatically regulate energy consumption. "This means that, via bidirectional communication between the software and the hardware, the Energis.cloud platform can instruct Raspicy to perform actions that will reduce energy waste. Think of it as a smart thermostat that not only controls a building's temperature but also a vast array of other parameters such as humidity, occupancy, external weather, CO<sub>2</sub> emissions, and many other energy performance data," Santoro adds.

## NEVER WASTE A GOOD CRISIS

As the trusted technological partner of energy experts, Energis invests heavily in the further development of such innovative modules and features. "Our future investments will focus on expanding the AI capabilities of our platform in order to trigger automatic actions and make smart suggestions leading to energy savings," Santoro says.

Moreover, the company's founder and CEO firmly believes that the transition to smart buildings is currently accelerating. "In the wake of the COVID-19 pandemic, buildings are less occupied but still need to be monitored and managed. This is the reason why our investments are oriented towards the strengthening of our remote-control operations and management of the environment capabilities," he continues.

## BRUSSELS AND WALLONIA SUPPORT

Energis can count on the unwavering support of Belgian public authorities to carry out its research in innovative smart technologies. "Over the last few years, Belgium has, as a whole, invested a lot in smart green technologies and the development of innovative digital solutions, such as our energy management platform, for more rational energy use. This has resulted in the creation of many start-ups and scale-ups that are not only active in Belgium but also contribute to the deployment of sustainable solutions all over Europe," comments Santoro.

"The support we have received from public organizations has been providential in the development of our company. In this way, Innoviris, the

Brussels institute for research and innovation, has financially supported the development of our innovative AI-powered platform, with the Société Régionale d'Investissement de Wallonie (SRIW, Regional Investment Company of Wallonia) also investing capital in the company," confirms Santoro.

## CONQUERING FOREIGN MARKETS FROM A DISTANCE

From its headquarters in Belgium and its Italian branch in Caserta, Energis can remotely offer a Software as a Service (SaaS) product worldwide without any geographical restriction. "Accessing international markets is straightforward in the sense that we can deliver our cloud-based technological solutions from a distance. Once we have established the first contact through digital marketing campaigns or through our network of certified partners, all sales cycles will be carried out remotely: the demo, contract negotiations, configuration and support services for the initial set-up, training, assistance services, etc.," explains Santoro.

Foreign markets now account for 80% of Energis' turnover. As a matter of fact, the company has already done business in Belgium, the Netherlands, France, Italy, Portugal, Spain, the US, Mexico, Brazil, The Philippines, Cameroon, as well as other countries. "For example, we monitor and manage the consumption of more than 600 Auchan supermarkets all over France on a daily basis and expect to do the same with their sites outside France in the near future," adds Santoro. "We also manage more than 300 photovoltaic installations and countless industrial sites all over Europe and all of this from Belgium," he concludes.



INTERVIEW WITH  
**François Macq, CEO**

## SMART CITIES

COMPANY

**MACQ**

REGION

**Brussels**

Founded: 1923

Location: Brussels

Number of employees: 100

Turnover (2019): EUR 17.8 million

Growth (2019): between 15 and 20%

Investments (2019): 30% of turnover

Start of exports: 1923

Share of exports in turnover: 15-20%

Prizes, awards: Trends Gazelle 2020:  
fastest growing companies – medium-  
sized enterprises category



Macq is a third-generation family-owned company based in Brussels that operates two complementary business units: Macq Mobility and Macq Engineering. Whereas the former provides innovative products for high-end applications in the Smart Mobility and Intelligent Transport Systems (ITS) sectors, the latter helps companies to manage sophisticated projects and develop cutting-edge solutions and products.

"We are experts in value-added hardware and software solutions for the smart urban mobility sector and in engineering project management," asserts François Macq, CEO of Macq. "We distinguish ourselves by developing all our solutions in-house, which gives us the freedom to easily adapt our products to the needs of our customers" he adds.

### ONE SMART CAMERA, ENDLESS FEATURES

The company has been the Belgian market leader in the area of smart mobility for more than twenty years. Today, by centralizing all mobility-related data, its multi-functional hardware and software solutions can gain high levels of understanding from real traffic situations, generate valuable insights for decision-makers and create a safer and healthier mobility environment.

*"It is like in the Middle Ages except that, instead of raising high walls to protect the city, we install cameras to monitor all the vehicles entering the city to protect its citizens."*

"Thanks to our ever-increasing number of smart sensors, cameras and other devices in operational use on the Belgian road and rail infrastructure, we are able to collect a tremendous amount of mobility-related data," explains Macq. "In order to leverage this data for decision-making, the company has developed two AI-based innovative data management solutions: the Macq Mobility Manager (M<sup>3</sup>), and the School Safety System (S<sup>3</sup>)," he continues.

Macq's M<sup>3</sup> software platform is mainly designed for law enforcement authorities in urban settings but is also used by road managers and traffic analysts. "Thanks to our solutions, Belgian police and customs authorities can automatically recognize the number plates of any vehicle entering a designated area, draw up blacklists for stolen or uninsured vehicles, measure the average speed of vehicles through control sections, detect red traffic light violations, and many more applications



that enhance road safety,” Macq explains. “In fact, it is like in the Middle Ages except that, instead of raising high walls to protect the city, we install cameras to monitor all the vehicles entering the city to protect its citizens,” Macq states.

The S3 platform, for its part, aims at safeguarding and monitoring road traffic around schools to provide the highest possible protection for children and minimize the risk of accidents. “Our solutions drastically increase road safety around schools by controlling average speed, double parking, overtaking and other dangerous driving behaviors,” emphasizes Macq.

## LOW EMISSION ZONE (LEZ) AND EQS

In order to improve the city’s air quality and, therefore, public health, the Brussels-Capital Region recently implemented a low emission zone where the most polluting vehicles are banned from traffic. More than 300 Macq cameras connected to M<sup>3</sup> software were deployed in Belgium’s capital city in order to monitor all the vehicles entering the LEZ.

“It is actually quite simple. Thanks to automatic number plate recognition (ANPR), our smart cameras keep track of all the vehicles circulating within the LEZ and subsequently provide a comprehensive list to the Belgian Vehicle Registration Service (DIV), which in turn is able to establish whether a vehicle is clean or not,” explains Macq.

In addition to its smart cameras, Macq also provides a highly reliable Environmental Quality Sensor (eQs) for environmental quality monitoring. “Our eQs is specifically designed to

accurately measure the most important gaseous pollutants (NO<sub>2</sub>, O<sub>3</sub>, VOC, CO, CO<sub>2</sub>), forecast weather parameters – such as air pressure, temperature, humidity, and rain – and monitor noise in urban areas, road networks or around industrial sites,” Macq adds.

## WORLDWIDE PRESENCE

Although its main business focus is currently on European countries, Macq pursues an international sales strategy and, thanks to its worldwide network of partners, integrators, distributors and sales representatives, has already implemented projects in non-European countries such as Brazil, Vietnam, and Turkey.

When addressing new foreign markets, Macq usually adopts a threefold export strategy. “First, our hardware, i.e. smart cameras, can be sold individually to foreign public authorities or mobility managers for them to collect traffic-related data,” says the company’s CEO. In addition, Macq’s hardware solutions can also be sold to foreign companies that in turn integrate them into their products. “As an original equipment manufacturer (OEM), our smart cameras can be sold to large companies involved in traffic management that integrate our technologies into their solutions,” he continues.

Secondly, should our customers already be in possession of cameras for data collection, we can provide them with our SaaS mobility management platform for analysis purposes. Finally, our ideal export strategy is quite obviously to provide global solutions to our customers by exporting both our hardware solutions and our innovative software platform,” Macq affirms.

“In the end, our current private and public customers are our most effective ambassadors. The Belgian federal police (FEDPOL), for example, has often praised the merits of our products abroad. Indeed, thanks to several fruitful collaborations with other federal police agencies, our know-how is now being exported to the Netherlands,” Macq proudly states.

## BLUE OCEAN STRATEGY

François Macq believes that three major opportunities will foster the Brussels company’s growth. “First of all, even in Covid-19 and lockdown times, traffic will keep growing, which will considerably increase the relevance of our solutions. Secondly, because Belgian number plates are very difficult to decipher due to their small characters written in red on white, our ANPR expertise is unique and the most effective in the world. Thirdly and lastly, the growing number of municipal administrative sanctions applied at the urban level for traffic offenses will considerably increase the demand for our solutions,” Macq believes.

Mobility is indeed a huge market, and the company’s CEO hopes to reach a turnover of EUR 100 million by 2023, when Macq will be blowing out 100 candles. “Today, our software solution is capable of integrating all types of cameras developed by our competitors. The next step would be to integrate the software solutions of our competitors into our software management platform according to a blue ocean strategy,” asserts Macq. “Innovation is the most crucial element in our company’s philosophy and will always remain part of our DNA,” Macq concludes.



INTERVIEW WITH  
**Steven Conderaerts**, Business Development  
 Manager Benelux

## SMART CITIES

COMPANY

**Smartnodes**

REGION

**Wallonia**

Founded: 2014 as an independent company, part of the Lacroix Group since 2019

Location: Liège

Number of employees: 16

Turnover (2019): EUR 1 million

Growth (2019): + 100%

Start of exports: 2018

Share of exports in turnover: 15%

Prizes, awards: Solar Impulse Efficient Solution, Red Herring Europe 100 Winner, Deloitte Rising Star nominee



Relying on a wireless communication network, Smartnodes provides smart lighting solutions to public authorities. "Through the awarding of public tenders, grid providers and local governments entrust Smartnodes with the operation of their network with the final objective of installing smart lighting systems in their public outdoor areas. Using our solutions reduces energy consumption by up to 70% and achieves CO<sub>2</sub> reduction targets," says Steven Conderaerts, Business Development Manager Benelux at Smartnodes.

Last year, Smartnodes joined hands with the French LACROIX Group, a European leader in smart city technology, in order to provide its innovative control modules for dynamic outdoor lighting to a larger audience. "Street lights are the backbone of smart cities. The local and regional public authorities have an existing, reliable

and flexible lighting infrastructure at its disposal for our state-of-the-art technology. Putting high-technology at the service of human well-being, quality of life and urban sustainable development, enables maximal energy savings to be achieved without reducing the visual comfort and safety of road users," he adds.

### ONLY LIGHT THE ROAD WHEN THERE IS A USER

Today, roads and pathways are lit so that we can move around safely with good visual comfort. However, when nobody is present, energy is wasted meaninglessly. This is why Smartnodes has elaborated a new way of lighting to solve this problem: the light bubble.

"Placing a Smartnodes device on every public luminary will trigger the switching on of a light bubble that detects a specific type of user (pedestrians, cyclists or car drivers) and defines precise characteristics such as position and speed. Moreover, since the light bubble moves along with the user, he or she will not notice that light varies outside of his/her field of vision," explains Steven Conderaerts.

It is through their wireless communication network that nodes can determine if a user is present and can continuously adapt several lighting

*"By fully mastering and upgrading its intelligent outdoor lighting system, Smartnodes offers the best independent and evolutive network for the sustainable future of urban environments and regional infrastructures."*





parameters according to the information at hand. "Composed of specific sensors, a processor and its memory, all nodes are interconnected and communicate between each other in order to take appropriate local lighting actions. This local intelligent node system provides multiple accurate local lighting functionalities. For instance, the same Smart Lighting System (SLS) nodes that control street lights could also feed information to traffic signal controllers," he continues.

Such a system is a fully decentralized solution, as the intelligence is spread onto each node. "As a matter of fact, each node is totally autonomous and shares its knowledge with the other nodes without deciding for them what they should do. The sound functioning of the system therefore does not depend on one specific node, which strengthens the robustness and reliability of our solution," Steven Conderaerts emphasizes.

## AN ADAPTABLE AND EVOLUTIVE SOLUTION

The big advantage of Smartnodes technologies compared to other smart lighting products is that its solution is adaptable and evolutive. As a matter of fact, by fully mastering and upgrading its intelligent outdoor lighting system, Smartnodes offers the best independent and evolutive network for the sustainable future of urban environments and regional infrastructures.

"On the one hand, together with our customers, we can determine several lighting parameters such as the

minimum light level and the dim up and dim down times of a luminary," Steven Conderaerts says. In addition, Smartnodes' wireless communication network can also be used to collect traffic data in combination or not with smart sensors. "At the moment, one of our biggest customers does not make use of our sensor solutions but solely of our wireless communication network to deploy the right light level to be applied at a certain time of night," he adds.

"On the other hand, all our smart lighting systems are embedded solutions that can be upgraded with new functionalities throughout their lifecycle according to the needs of the end customers. For example, we have developed in collaboration with a spin-off of the university of Ghent, a reliable noise solution that we can integrate in our wireless communication network. Moreover, if we were to succeed in developing a reliable air quality sensor for open-air applications, we could upgrade our Smartnodes product in the field by integrating this new solution into our wireless communication network," Steven Conderaerts affirms.

## CONQUERING THE WORLD

Public authorities have been talking about smart cities for a long time without taking action. Today, however, more and more specific projects are being set up both in Belgium and abroad. Being part of a large international group now makes it easy for Smartnodes to tackle foreign markets and offer its innovative solutions around the world thanks to its sales agents and local distributors.

"Thanks to a partnership with local electricity grid operators and foreign government authorities, we have installed smart street lighting systems all over Europe. Our innovative smart street solution in the form of dynamic and connected street lighting in Heinsberg (Germany), for example, is a showcase project that enables us to acquire further customers all over the country. In overall terms, the implementation of the project will save up to 44 tons of CO<sub>2</sub> per year in Heinsberg and reduce annual street lighting costs by almost 34 percent," says Steven Conderaerts proudly.

Furthermore, Smartnodes recently took its first steps outside of Europe in Israel and has received various inquiries from the Middle East. "Our internationalization process is progressing step-by-step and we aim to address the Middle Eastern and North American markets in the coming years with LACROIX Group. European markets will however remain our main focus in the meantime and, based on our smart city knowledge, LACROIX Group as a whole will be able to further deliver solutions for a future-proof and sustainable urban organization," concludes Steven Conderaerts.

*"Being part of a large international group now makes it easy for Smartnodes to tackle foreign markets and offer its innovative solutions around the world."*



INTERVIEW WITH  
**Michaël Geelhand de Merxem,**  
*Chief Business Officer*

SMART CITIES

COMPANY

THE BEACON

REGION

Flanders

Founded: 2018

Location: Antwerp

Number of employees: 3

Number of members: 75

Website: [www.thebeacon.eu](http://www.thebeacon.eu)



The Beacon was founded in 2018 by six major partners, i.e. the City of Antwerp, the University of Antwerp, the Port of Antwerp, Lantis, Agoria and Imec, with the aim of creating a community of companies, knowledge institutions and other organizations all involved in digital technology. "The core of the Beacon is to build a community that encourages companies to work together. We are a competence center established around digital technology with AI and Internet of Things as spearheads and city, port and industry life as main points of focus," explains Michaël Geelhand de Merxem, Chief Business Officer of The Beacon.

*"What distinguishes the Beacon from other organizations is that the link between academia, government and business is also present in its community."*

want to achieve by matching supply and demand for innovation, lining up two poles," adds Geelhand de Merxem.

THE KEY IS ALWAYS COLLABORATION

What distinguishes the Beacon from other organizations is the link between academia, government and business within its community. "Our partnership with Imec and the University of Antwerp offers the opportunity to valorize academic research. The city, the port authority and Lantis, which play the role of the government, all face challenges to which the community members of The Beacon can offer innovative solutions. And that's something we

The Beacon does so in three ways. First, "Work together" offers physical workspaces in the Beacon's building in Antwerp. "We combine a community with a physical workplace which is the key to the success of the Beacon. People meet each other here at events, during meetings, when they walk past someone's office, go out for coffee or sit in the refectory on the terrace together. The corona crisis has dealt a terrible blow to the Beacon's lifeline. We have decided to deal with



this in an assertive way by seizing all digital opportunities and by starting up the New Work project in which we are conducting a user acceptance test in the building of about 20 technologies that can make the workplace more productive, healthier and safer. We hope to make the office a safe haven thanks to technology," the CBO explains.

Second, "Connect together" ensures that the 75 members of the community are connected to each other by means of, among other things, organized B2B matchmaking opportunities. Third, "Act together" allows the companies to work together by getting all interested parties around the table, defining a project and putting it on track. "This can be a spontaneous or an innovation project or just an activity, an event or a paper for companies encountering the same problems or sharing an interest in the same technology. Collaboration is key and must always lead to real results. If we can ensure that those companies find each other and do something together, then our mission will have been successful," adds the CBO.

## COME SOLVE A BIGGER PROBLEM WITH US

The Beacon works with focus teams around fundamental issues in five main disciplines: industry, mobility, ports & logistics, smart city and smart buildings. "It is definitely a good investment for a city with policymakers and governments to have an ideas and solutions factory where you can go to with your challenges. That is precisely the role the Beacon has to play: come to us with a bigger challenge or come to us to solve a bigger problem you have in your city, port or industry," comments the CBO.



"When the city of Antwerp contacts the Beacon with something they want to do, we put our brains to work, put out tenders or hand-pick companies and try to present some value added options to city officials with the intention of really doing something with optimum economic and social relevance. For example, over the next six months, we will carry out a project to "smarten up" the lighting and bus shelters in the city of Antwerp," he continues.

## INTERNATIONALIZATION

The majority of the companies in the Beacon community operate internationally. "Many companies in our community have been in business for at least three years. They are small but have a well-defined and marketable product or service, a customer base and focus on growth. I think very few companies limit their scope to Belgium and solely look at the Belgian market. We also have a number of major international players in our network, such as Engie, Microsoft, Atos, Siemens Mobility," says Geelhand de Merxem.

As for the Beacon itself, it is not yet appropriate to get involved at the

*"I think that we will have achieved something incredible that has never been done anywhere else before."*

international level. "At the moment, before considering international prospecting, we need to focus our efforts on Belgium, where the number of players in the technology sector is large enough to start with. Active partnership and cooperation in the digital sector leading to specific results, rather than just a talking shop or an introductory platform, is something that has potential everywhere, whether in Brussels, Antwerp or New York, it doesn't matter," dreams Michaël Geelhand de Merxem.

## FUTURE PROJECTS

The Beacon is looking positively to the future in the short and medium term. According to the CBO, "the intention is to start and hopefully complete one specific project from each of the five disciplines before the end of the year. In this way, we want to position the Beacon with a number of deliverables. The step for next year, in addition to keeping the network relevant, large and dynamic, is to offer even more content and, ultimately, to influence the social debate more and more from a digital technology point of view.

The CBO sees another major challenge for smart cities in the entire tendering process, namely translating the challenges of government into concrete opportunities for companies. "If we can find a way of translating indistinct challenges faced by a government or an organization into a more acute problem that companies can understand and act upon in a flexible manner, then I think that we will have achieved something incredible that has never been done anywhere else before. Then we would have proven our added value as an organization," concludes Michaël Geelhand de Merxem.





**DIRECTORY**  
OF COMPANIES

We would like to point out that this directory contains only a fraction of Belgian companies operating in Sustainable Building Solutions and/or Smart Cities. For more comprehensive company information, do check the respective websites of clusters, trade associations and branch organizations appearing in this report – under section 2.2 in chapter 1. Alternatively, more information is also available from Flanders Investment & Trade (FIT), Wallonia Export-Investment Agency (AWEX) and [hub.brussels](http://hub.brussels).

COMPANY NAME	ZIP	CITY	WEBSITE	SUSTAINABLE BUILDING SOLUTIONS		SMART CITIES	
&SENS	1140	Brussels	<a href="http://www.etsens.be">www.etsens.be</a>	•			
OPNS - OPEN PRODUCTS, NETWORKS & SOFTWARE	1060	Brussels	<a href="http://www.opns.be">www.opns.be</a>				•
2ARCHITECTES	1200	Brussels	<a href="http://www.2architectes.be">www.2architectes.be</a>	•			
2D GROUPE	7501	Orcq	<a href="http://www.2dgroupe.com">www.2dgroupe.com</a>	•			
3E/DUSS EXPLORERS	1000	Brussels	<a href="http://www.3E.eu">www.3E.eu</a>	•	•		
A.C.I.T	7070	Le Roeulx	<a href="http://www.acit-sa.com">www.acit-sa.com</a>	•			
A+ CONCEPT	4432	Allieur	<a href="http://www.a-concept.be">www.a-concept.be</a>	•			
A2 CONSEILS	6720	Habay-La-Neuve	<a href="http://www.a2conseils.be">www.a2conseils.be</a>	•			
A2M	1050	Brussels	<a href="http://www.a2m.be">www.a2m.be</a>	•	•		
ABELCO	1000	Brussels	<a href="http://www.abelco.be">www.abelco.be</a>	•			
ACOUSTIX	4040	Herstal	<a href="http://www.acoustix.be">www.acoustix.be</a>	•			
ACT & SORB	3600	Genk	<a href="http://www.actandsorb.com">www.actandsorb.com</a>	•			
ACTIF TOITURES	1420	Braine-L'alleud	<a href="http://www.actiftoitures.be">www.actiftoitures.be</a>	•			
ACTINA - GALTANE	1402	Nivelles	<a href="http://www.galtane.com">www.galtane.com</a>	•			
ACTIV'ARCHITECTURE	6780	Hondelange	<a href="http://www.activarch.be">www.activarch.be</a>	•			
ADDAX MOTORS	8540	Deerlijk	<a href="http://www.addaxmotors.com">www.addaxmotors.com</a>				•
ADE ARCHITECTS	1170	Brussels	<a href="http://www.ade-archi.be">www.ade-archi.be</a>	•			
ADVISERS	1000	Brussels	<a href="http://www.advisers.be">www.advisers.be</a>	•	•		
ADVITAMPIERRE SPRL	1370	Melin	<a href="http://www.advitampierre.be">www.advitampierre.be</a>	•			
AKATZ	7740	Warcoing	<a href="http://www.acacia-robinier.be">www.acacia-robinier.be</a>	•			
ALEXANDRU PATRICHI ARCHITECT	1050	Brussels	<a href="http://www.alexandrupatrichi.eu">www.alexandrupatrichi.eu</a>	•			
ALIPLAST	9160	Lokeren	<a href="http://www.aliplast.com">www.aliplast.com</a>	•			
ALL THINGS TALK	2800	Mechelen	<a href="http://www.allthingstalk.com">www.allthingstalk.com</a>				•
ALOXY	2000	Antwerp	<a href="http://www.aloxy.io">www.aloxy.io</a>				•
ALPHA CONSTRUCT INGENIEURS	1030	Brussels	<a href="http://www.alpha-construct-ingenieurs.be">www.alpha-construct-ingenieurs.be</a>	•	•		
ALXSYS SYSTEMS	4460	Velroux	<a href="http://www.alxsys.com">www.alxsys.com</a>				•
ANTOINE YVAN	6761	Latour-Virton	<a href="http://www.yvanantoine.be">www.yvanantoine.be</a>	•			
ANYWAYS	3200	Aarschot	<a href="http://www.anyways.eu">www.anyways.eu</a>				•
APTUS	8501	Bissegem	<a href="http://www.aptus.be">www.aptus.be</a>				•
AQUATECH	5032	Isnes-Gembloux	<a href="http://www.aquatech-bel.be">www.aquatech-bel.be</a>	•			
ARCHIPELAGO	1160	Brussels	<a href="http://www.archipelago.be">www.archipelago.be</a>	•	•		
ARCHITECTS TEAM MARC STEFFENS	4730	Hauset	<a href="http://www.atteam.be">www.atteam.be</a>	•			

COMPANY NAME	ZIP	CITY	WEBSITE	SUSTAINABLE BUILDING SOLUTIONS	SMART CITIES
ARCHITECTURE & NATURE-COOPERATIVE D'ARCHITECTES	5020	Temploux	<a href="http://www.architectureenature.be">www.architectureenature.be</a>	•	
AREARCHITECTS	6700	Arlon	<a href="http://www.arearchitects.be">www.arearchitects.be</a>	•	
ARGILIERE HINS	5620	Florennes	<a href="http://www.hins.be">www.hins.be</a>	•	
ART & BUILD ARCHITECTS	1060	Brussels	<a href="http://www.artbuild.eu">www.artbuild.eu</a>	•	•
ARTE CONSTRUCTO	2627	Schelle	<a href="http://www.artestructo.com">www.artestructo.com</a>	•	
ARTER	1000	Brussels	<a href="http://www.arter.be">www.arter.be</a>	•	•
ARWO-BOUW	2370	Arendonk	<a href="http://www.arwobouw.be">www.arwobouw.be</a>	•	
ASSAR ARCHITECTS	1170	Brussels	<a href="http://www.assar.com">www.assar.com</a>	•	•
AT OSBORNE	1060	Brussels	<a href="http://www.atosborne.be">www.atosborne.be</a>	•	•
ATELIER BRISMOUTIER-F-M ARCHITECTE	5000	Beez	<a href="http://www.brismoutier.be">www.brismoutier.be</a>	•	
ATELIER D'ARCHITECTURE GALAND	1190	Brussels	<a href="http://www.atelier-architecture-galand.be">www.atelier-architecture-galand.be</a>	•	
ATELIER DE L'AVENIR	4460	Grace Hollogne	<a href="http://www.atelier-de-lavenir.be">www.atelier-de-lavenir.be</a>	•	
ATELIER DE PONTAURY	5640	Mettet	<a href="http://www.pontaury.be">www.pontaury.be</a>	•	
ATELIER ESPACE ARCHITECTURAL MARC SOMERS	1060	Brussels	<a href="http://www.somersespace.be">www.somersespace.be</a>	•	
AXA IM - REAL ASSETS	1170	Brussels	<a href="http://www.axa-im.com">www.axa-im.com</a>	•	•
B2AI	1000	Brussels	<a href="http://www.b2ai.com">www.b2ai.com</a>	•	•
B71	4000	Liège	<a href="http://www.b71.be">www.b71.be</a>		•
BAM CONTRACTORS	1120	Brussels	<a href="http://www.bamcontractors.be">www.bamcontractors.be</a>	•	•
BAO LIVING	2100	Antwerp	<a href="http://www.baoliving.com">www.baoliving.com</a>	•	
BASALTE	9820	Merelbeke	<a href="http://www.basalte.be">www.basalte.be</a>		•
BATISOMME	5377	Somme-Leuze	<a href="http://www.batisomme.be">www.batisomme.be</a>	•	
BC ARCHITECTS & STUDIES	1000	Brussels	<a href="http://www.bc-as.org">www.bc-as.org</a>	•	
BC MATERIALS	1000	Brussels	<a href="http://www.bcmaterials.org">www.bcmaterials.org</a>	•	
BEDDELEEM INTERNATIONAL	9810	Nazareth	<a href="http://www.beddeleem.be">www.beddeleem.be</a>	•	•
BELISOL	1160	Brussels	<a href="http://www.belisol.be">www.belisol.be</a>	•	
BENEENS	2250	Olen	<a href="http://www.beneens.be">www.beneens.be</a>	•	
BEPARK	1030	Brussels	<a href="http://www.bepark.eu/en/belgium">www.bepark.eu/en/belgium</a>		•
BESIX	1200	Brussels	<a href="http://www.besix.com">www.besix.com</a>	•	•
BESTBRIDGES	1000	Brussels	<a href="http://www.bestbridges.eu">www.bestbridges.eu</a>	•	
BHC	7000	Mons	<a href="http://www.bhc.be">www.bhc.be</a>		•
BIKENWIN	4130	Esneux	<a href="http://www.bikenwin.com">www.bikenwin.com</a>		•
BIZZDEV	7500	Tournai	<a href="http://www.bizzdev.com">www.bizzdev.com</a>		•
BLUE GATE ANTWERP	2000	Antwerp	<a href="http://www.bluegateantwerp.eu">www.bluegateantwerp.eu</a>	•	•
BOIS INTEMPOREL	1070	Brussels	<a href="http://www.bois-intemporel.com">www.bois-intemporel.com</a>	•	
BOPRO	9000	Ghent	<a href="http://www.bopro.be">www.bopro.be</a>	•	
BOURGUIGNON BOIS	1457	Tourinnes-Saint-Lambert	<a href="http://www.bourguignonbois.be">www.bourguignonbois.be</a>	•	
BRUNET	5660	Mariembourg	<a href="http://www.brunet-sa.be">www.brunet-sa.be</a>	•	
BSOLUTIONS MANAGEMENT SCPRL	5032	Gembloux	<a href="http://www.bsolutions.be">www.bsolutions.be</a>	•	

COMPANY NAME	ZIP	CITY	WEBSITE	SUSTAINABLE BUILDING SOLUTIONS		SMART CITIES
BUILDING FOR THE FUTURE-B4F	1170	Brussels	<a href="http://www.b4f.eu">www.b4f.eu</a>	•	•	•
BUILDWIND	1070	Brussels	<a href="http://www.buildwind.net">www.buildwind.net</a>	•	•	•
BUREAU BOUWTECHNIEK	2000	Antwerp	<a href="http://www.b-b.be">www.b-b.be</a>	•	•	•
BUUR	1030	Brussels	<a href="http://www.buur.be">www.buur.be</a>	•	•	•
BXMLRS	1060	Brussels	<a href="http://www.bxmlrs.eu">www.bxmlrs.eu</a>	•	•	•
CALYPSO NETWORKS ASSOCIATION	1000	Brussels	<a href="http://www.calypsonet-asso.org">www.calypsonet-asso.org</a>	•	•	•
CARODEC	1332	Genval	<a href="http://www.carodec.be">www.carodec.be</a>	•	•	•
CEGEKA	3500	Hasselt	<a href="http://www.cegeka.com">www.cegeka.com</a>	•	•	•
CENAREO	6041	Gosselies	<a href="http://www.cenaero.be">www.cenaero.be</a>	•	•	•
CENENERGY	2550	Kontich	<a href="http://www.cenenergy.be">www.cenenergy.be</a>	•	•	•
CERAU	1050	Brussels	<a href="http://www.cerau.com">www.cerau.com</a>	•	•	•
CFE - COMPAGNIE D'ENTREPRISES	1160	Brussels	<a href="http://www.cfe.be">www.cfe.be</a>	•	•	•
CHANVRE & CO	4550	Nandrin	<a href="http://www.chanvreco.be">www.chanvreco.be</a>	•	•	•
CHIMSCO-MAISON BOIS MEUNIER	5590	Achene	<a href="http://www.chimsko.be">www.chimsko.be</a>	•	•	•
CITA VERDI	1030	Brussels	<a href="http://www.citaverdi.com">www.citaverdi.com</a>	•	•	•
CITIZENLAB	1000	Brussels	<a href="http://www.citizenlab.co">www.citizenlab.co</a>	•	•	•
CITYMESH	8020	Oostkamp	<a href="http://www.citymesh.com">www.citymesh.com</a>	•	•	•
CIVADIS	5020	Namur	<a href="http://www.civadis.be">www.civadis.be</a>	•	•	•
CLT-S	2260	Oevel	<a href="http://www.clt-s.be">www.clt-s.be</a>	•	•	•
COCON/WARSCO UNITS	3600	Genk	<a href="http://www.coconbywarSCO.be">www.coconbywarSCO.be</a>	•	•	•
CODIC	1000	Brussels	<a href="http://www.fr.codic.eu">www.fr.codic.eu</a>	•	•	•
COMMUNITHINGS	1040	Brussels	<a href="http://www.communithings.com">www.communithings.com</a>	•	•	•
CONSTRUCTION ALTERNATIVE	7610	Rumes	<a href="http://www.construction-alternative.com">www.construction-alternative.com</a>	•	•	•
CONSTRUCTION WÉRY SPRL	5300	Maizeret	<a href="http://www.construction-wery.be">www.construction-wery.be</a>	•	•	•
COOPEOS	1340	Ottignies	<a href="http://www.coopeos.be">www.coopeos.be</a>	•	•	•
CORBISIER ARCHITECTES	1190	Brussels	<a href="http://www.corbisier.be">www.corbisier.be</a>	•	•	•
CORES DEVELOPMENT	2018	Antwerp	<a href="http://www.coresdevelopment.be">www.coresdevelopment.be</a>	•	•	•
COULEUR TERRE	5570	Beauraing	<a href="http://www.couleurterre.be">www.couleurterre.be</a>	•	•	•
CUPA PIZARRAS	7500	Tournai	<a href="http://www.cupapizarras.com">www.cupapizarras.com</a>	•	•	•
D2D3	5024	Namur	<a href="http://www.d2d3.com">www.d2d3.com</a>	•	•	•
DAGO	2140	Antwerp	<a href="http://www.dago.be">www.dago.be</a>	•	•	•
DAIKIN EUROPE	8400	Ostend	<a href="http://www.daikin.eu">www.daikin.eu</a>	•	•	•
DAPESCO	1348	Ottignies	<a href="http://www.dapesco.com">www.dapesco.com</a>	•	•	•
DDS+	1050	Brussels	<a href="http://www.dds-partners.eu">www.dds-partners.eu</a>	•	•	•
DECEUNINCK COMPOUND & RECYCLING	8600	Diksmuide	<a href="http://www.deceuninck.be">www.deceuninck.be</a>	•	•	•
DELHAYE JEAN-MARIE	4000	Liège	<a href="http://www.jmdelhaye.wixsite.com/architecte">www.jmdelhaye.wixsite.com/architecte</a>	•	•	•
DEMOCO	3500	Hasselt	<a href="http://www.democo.be">www.democo.be</a>	•	•	•
DIGITAL ATTRAXION	7000	Mons	<a href="http://www.digital-atraxon.com">www.digital-atraxon.com</a>	•	•	•

COMPANY NAME	ZIP	CITY	WEBSITE	SUSTAINABLE BUILDING SOLUTIONS	SMART CITIES
DIGITAL MEDIA CONSULTING	4330	Ans	<a href="http://www.digital-media-consulting.be">www.digital-media-consulting.be</a>		•
DMOA ARCHITECTS	3001	Heverlee	<a href="http://www.dmoa.be">www.dmoa.be</a>	•	
DXA.ARCHI	1050	Brussels	<a href="http://www.dxa.archi">www.dxa.archi</a>	•	•
DZEROSTUDIO ARCHITECTES	1020	Brussels	<a href="http://www.dzerostudio.com">www.dzerostudio.com</a>	•	
ECO CONCEPT SOLUTIONS	1020	Brussels	<a href="http://www.ecoconceptsolutions.be">www.ecoconceptsolutions.be</a>	•	•
ECO EFFICIENCE	1000	Brussels	<a href="http://www.ecoefficiency.be">www.ecoefficiency.be</a>	•	•
ECOBATI	4040	Herstal	<a href="http://www.ecobati.com">www.ecobati.com</a>	•	
ECOLOGDE	4280	Moxhe	<a href="http://www.waldcube.be">www.waldcube.be</a>	•	
ECO-LOGIS	5310	Leuze-Eghezee	<a href="http://www.eco-logis.be">www.eco-logis.be</a>	•	
ECOMAT	2980	Zoersel	<a href="http://www.ecomat.be">www.ecomat.be</a>	•	
ECONCEPTION	5030	Gembloux	<a href="http://www.econception.be">www.econception.be</a>	•	
ECOTOITURE	5640	Maison St Gerard	<a href="http://www.ecotoiture.be">www.ecotoiture.be</a>	•	
ECOWEZ	6540	Lobbès	<a href="http://www.ecowez.be">www.ecowez.be</a>	•	
EDGAR ARCHITECTURE	1060	Brussels	<a href="http://www.edgar-archi.be">www.edgar-archi.be</a>	•	
EEG GROUP	8560	Wevelgem	<a href="http://www.eeg.be">www.eeg.be</a>		•
ELCO BELGIUM	1070	Brussels	<a href="http://www.be.elco.net">www.be.elco.net</a>	•	•
E-MOTIONLABS	3500	Hasselt	<a href="http://www.e-motionlabs.co">www.e-motionlabs.co</a>		•
EPOC ARCHITECTURE	1000	Brussels	<a href="http://www.epoc-architecture.be">www.epoc-architecture.be</a>	•	
ESPACIEL	1060	Brussels	<a href="http://www.espaciel.com">www.espaciel.com</a>	•	
ETAP LIGHTING INTERNATIONAL	2390	Malle	<a href="http://www.etaplighting.com">www.etaplighting.com</a>	•	•
EUREKA ITS	4823	Rodange	<a href="http://www.eureka-its.com">www.eureka-its.com</a>		•
EUROFIBER BELGIUM	1930	Zaventem	<a href="http://www.eurofiber.com">www.eurofiber.com</a>		•
EXIE	2000	Antwerp	<a href="http://www.exih2.be">www.exih2.be</a>	•	
EXPOPOLIS	1300	Limal	<a href="http://www.expopolis.com">www.expopolis.com</a>		•
FIXSUS	9940	Ertvelde	<a href="http://www.fixsus.be">www.fixsus.be</a>		•
FLUICITY	1310	La Hulpe	<a href="http://www.flui.city">www.flui.city</a>		•
FLUVIUS	9090	Melle	<a href="http://www.fluvius.be">www.fluvius.be</a>		•
FOAMGLAS	1380	Lasne	<a href="http://www.foamglas.com">www.foamglas.com</a>	•	
FTI-FLOW TRANSFER INTERNATIONAL	1180	Brussels	<a href="http://www.istema.be">www.istema.be</a>	•	•
G4S	1800	Vilvoorde	<a href="http://www.g4s.com">www.g4s.com</a>		•
GALVA POWER GROUP	3530	Houthalen	<a href="http://www.zinq.com">www.zinq.com</a>	•	
GECKOMATICS	2600	Antwerp	<a href="http://www.geckomatics.com">www.geckomatics.com</a>		•
GEOSPARC	9070	Destelbergen	<a href="http://www.geosparc.com">www.geosparc.com</a>		•
GIA SYSTEMS	3960	Bree	<a href="http://www.gia.be">www.gia.be</a>		•
GLOBAL CONNECTION	7822	Ath	<a href="http://www.globalconnection.be">www.globalconnection.be</a>		•
GROEP VAN ROEY	2310	Rijkevorsel	<a href="http://www.groepvanroey.be">www.groepvanroey.be</a>	•	
GUMPTION	2550	Kontich	<a href="http://www.gumption.eu">www.gumption.eu</a>		•
HAEMERS TECHNOLOGIES	1120	Brussels	<a href="http://www.haemers-technologies.com">www.haemers-technologies.com</a>	•	•

COMPANY NAME	ZIP	CITY	WEBSITE	SUSTAINABLE BUILDING SOLUTIONS		SMART CITIES	
HAVRESAC	7021	Havre	<a href="http://www.havresac.be">www.havresac.be</a>	•			
HELICUS	2610	Antwerp	<a href="http://www.helicus.com">www.helicus.com</a>				•
HELIUM3 ARCHITECTURE	4000	Liège	<a href="http://www.helium3.be">www.helium3.be</a>	•			
HOME EOS	6240	Farciennes	<a href="http://www.home-eos.eu">www.home-eos.eu</a>	•			
HOMECEPTION	1495	Marbais	<a href="http://www.homeception.be">www.homeception.be</a>	•			
HYDRO BUILDING SYSTEMS BELGIUM	3400	Landen	<a href="http://www.sapabuildingsystem.com">www.sapabuildingsystem.com</a>	•			
HYDROSCAN	3010	Leuven	<a href="http://www.hydroscan.eu">www.hydroscan.eu</a>				•
HYSOPT	2170	Antwerp	<a href="http://www.hysopt.com">www.hysopt.com</a>				•
IDEVY	6760	Virton	<a href="http://www.idevy.be">www.idevy.be</a>	•			
IFTECH	3582	Beringen	<a href="http://www.iftech.be">www.iftech.be</a>	•	•		
IKO	2020	Antwerp	<a href="http://www.be.iko.com">www.be.iko.com</a>	•			
IMMERACTIVE SA	1070	Brussels	<a href="http://www.immeractive.com">www.immeractive.com</a>				•
INGENIUM	8200	Bruges	<a href="http://www.ingenium.be">www.ingenium.be</a>	•	•		
INSEETU	1435	Mont-Saint-Guibert	<a href="http://www.inseetu.io">www.inseetu.io</a>				•
INTERALU	2610	Antwerp	<a href="http://www.interalu.eu">www.interalu.eu</a>	•			
INTOUCH	3800	Sint-Truiden	<a href="http://www.intouch.be">www.intouch.be</a>				•
IOT FACTORY	1000	Brussels	<a href="http://www.iotfactory.eu">www.iotfactory.eu</a>				•
IPEE	2610	Wilrijk	<a href="http://www.ipee.eu">www.ipee.eu</a>	•	•		
IP-MOBILE	1000	Brussels	<a href="http://www.ip-mobile.be">www.ip-mobile.be</a>				•
ISOHEMP	5380	Fernelmont	<a href="http://www.iso hemp.com">www.iso hemp.com</a>	•			
ISOLATION ECO.LOGIQUE	6700	Arlon	<a href="http://www.isolation-eco.be">www.isolation-eco.be</a>	•			
ISOWATT SOLUTIONS	1000	Brussels	<a href="http://www.mywatt-lighting.com">www.mywatt-lighting.com</a>	•	•		
JACQUES DELENS	1170	Brussels	<a href="http://www.jacquesdelens.be">www.jacquesdelens.be</a>	•			
JAGA	3590	Diepenbeek	<a href="http://www.jaga.com">www.jaga.com</a>				•
JEAN-PAUL HERMANT ARCHITECTES	1060	Brussels	<a href="http://www.jeanpaulhermant.be">www.jeanpaulhermant.be</a>	•			
JUUNOO	8550	Zwevegem	<a href="http://www.juunoo.com">www.juunoo.com</a>	•			
KABANDY	1040	Brussels	<a href="http://www.kabandy.com">www.kabandy.com</a>	•	•		
KIEBACK & PETER BELGIUM	1760	Roosdaal	<a href="http://www.kieback-peter.com">www.kieback-peter.com</a>				•
KINGSPAN UNIDEK	2280	Grobbendonk	<a href="http://www.kingspan.com">www.kingspan.com</a>	•			
KISS ARCHITECTS	5101	Lives-Sur-Meuse	<a href="http://www.kiss-a.be">www.kiss-a.be</a>	•			
KRINKELS	1840	Londerzeel	<a href="http://www.krinkels.be">www.krinkels.be</a>	•	•		
LA MAISON DE DEMAIN	6850	Carlsbourg	<a href="http://www.lamaisonedemain.be">www.lamaisonedemain.be</a>	•			
LA MAISON ECOLOGIQUE	5020	Suarlee	<a href="http://www.lamaisonecologique.be">www.lamaisonecologique.be</a>	•			
LA MAISON VERTE	1350	Folx-Les-Caves	<a href="http://www.maisonverte.be">www.maisonverte.be</a>	•			
LA VERTE VOIE	1320	Nodebais	<a href="http://www.lavertevoie.be">www.lavertevoie.be</a>	•			
LANDSCAPE DESIGN	1050	Brussels	<a href="http://www.landscape design.net">www.landscape design.net</a>	•	•		
LATERAL THINKING FACTORY	1070	Brussels	<a href="http://www.lateralthinkingfactory.com">www.lateralthinkingfactory.com</a>	•	•		
LCL BELGIUM	1831	Diegem	<a href="http://www.lcl.be">www.lcl.be</a>				•

COMPANY NAME	ZIP	CITY	WEBSITE	SUSTAINABLE BUILDING SOLUTIONS	SMART CITIES
LEBAILLY	7334	Hautrage	<a href="http://www.lebailly.eu">www.lebailly.eu</a>	•	
LES ARCHITECTES DRAPS	1020	Brussels	<a href="http://www.draps.info">www.draps.info</a>	•	
LES ENTREPRISES LOUIS DE WAELE	1170	Brussels	<a href="http://www.louisdewaele.be">www.louisdewaele.be</a>	•	
LES MENUISERIES BÂTISSEURS	6922	Halma	<a href="http://www.lesmenuisiersbatisseurs.be">www.lesmenuisiersbatisseurs.be</a>	•	
LETSGOCITY	4000	Liège	<a href="http://www.letsgocity.be">www.letsgocity.be</a>		•
L'HABITAT ECOLOGIQUE	7520	Ramegnies-Chin	<a href="http://www.habitat-ecologique.be">www.habitat-ecologique.be</a>	•	
LIMPIDO	6997	Erezee	<a href="http://www.limpido.be">www.limpido.be</a>	•	
LIVING APPS-POPPY	1090	Brussels	<a href="http://www.my-poppy.eu">www.my-poppy.eu</a>		•
LOPOS	9080	Lochristi	<a href="http://www.lopos.be">www.lopos.be</a>		•
LOWETTE & PARTNERS	1080	Brussels	<a href="http://www.lowette-partners.be">www.lowette-partners.be</a>	•	
LOYALTEK INTERNATIONAL	1000	Brussels	<a href="http://www.loyaltek.com">www.loyaltek.com</a>		•
LUMENCY	1020	Brussels	<a href="http://www.lumency.com">www.lumency.com</a>		•
MACHIELS BUILDING SOLUTIONS	3600	Genk	<a href="http://www.machielsbuildingsolutions.be">www.machielsbuildingsolutions.be</a>	•	
MACQ - TRAFFIC & AUTOMATION	1140	Brussels	<a href="http://www.macq.eu">www.macq.eu</a>		•
MADE IN ACOUSTIC	1180	Brussels	<a href="http://www.madeinacoustic.com">www.madeinacoustic.com</a>	•	
MAGGY	2550	Kontich	<a href="http://www.maggylife.eu">www.maggylife.eu</a>		•
MANIE TOUT SERVICES	7700	Mouscron	<a href="http://www.manietout-services.be">www.manietout-services.be</a>	•	
MATAGNE HODY	5555	Bievre	<a href="http://www.matagne-hody.com">www.matagne-hody.com</a>	•	
MATHY BY BOLS	5660	Mariembourg	<a href="http://www.mathy-by-bols.be">www.mathy-by-bols.be</a>	•	
MCB ATELIER	1070	Brussels	<a href="http://www.mcb-atelier.be">www.mcb-atelier.be</a>	•	
MDW ARCHITECTURE	1040	Brussels	<a href="http://www.mdw-architecture.com">www.mdw-architecture.com</a>	•	
MENUISERIE LECROART	7730	Saint-Leger	<a href="http://www.menuiserielecroart.be">www.menuiserielecroart.be</a>	•	
MENUISERIE RICHE	5660	Mariembourg	<a href="http://www.chassisriche.be">www.chassisriche.be</a>	•	
MERCURON	9070	Destelbergen	<a href="http://www.mercuron.eu">www.mercuron.eu</a>		•
METAFORMA ARCHITETTURA	1050	Brussels	<a href="http://www.metaforma.info">www.metaforma.info</a>	•	
MEULEMAN JP	7500	Tournai	<a href="http://www.toit-plat.com">www.toit-plat.com</a>	•	
MOBIC	4920	Harze	<a href="http://www.mobicsa.be">www.mobicsa.be</a>	•	
MOBIETRAIN	3600	Genk	<a href="http://www.mobietrain.com">www.mobietrain.com</a>		•
MODULO ARCHITECTS	1200	Brussels	<a href="http://www.modulo-architects.be">www.modulo-architects.be</a>	•	
MULTITEL	7000	Mons	<a href="http://www.multitel.be">www.multitel.be</a>		•
MYCSN	2060	Antwerp	<a href="http://www.mycsn.be">www.mycsn.be</a>		•
NATURA MATER	1040	Brussels	<a href="http://www.naturamater.eu">www.naturamater.eu</a>	•	
NATURE HABITAT	4470	Saint-Georges-Sur-Meuse	<a href="http://www.naturehabitat.be">www.naturehabitat.be</a>	•	
NATURHOME BELGIQUE	6672	Gouvy	<a href="http://www.naturhome.be">www.naturhome.be</a>	•	
NELTANE	6001	Marcinelle	<a href="http://www.neltane.com">www.neltane.com</a>	•	
NEW LIGHTS SA	1140	Brussels	<a href="http://www.eurospotlite.be">www.eurospotlite.be</a>	•	•
NEW TECHNOLOGY	4710	Lontzen	<a href="http://www.new-technology.be">www.new-technology.be</a>	•	
NEY & PARTNERS WOW	5000	Namur	<a href="http://www.bureau-etudes-bois.be">www.bureau-etudes-bois.be</a>	•	

COMPANY NAME	ZIP	CITY	WEBSITE	SUSTAINABLE BUILDING SOLUTIONS		SMART CITIES	
NIKO	9100	Sint-Niklaas	<a href="http://www.niko.eu">www.niko.eu</a>				•
OH-CHEF	1200	Brussels	<a href="http://www.oh-chef.be">www.oh-chef.be</a>				•
OPEN MOTICS	9000	Ghent	<a href="http://www.openmotics.com">www.openmotics.com</a>				•
OPINUM	1435	Mont-Saint-Guibert	<a href="http://www.opinum.com">www.opinum.com</a>				•
ORBIX	3600	Genk	<a href="http://www.orbix.be">www.orbix.be</a>	•			
PAILLE-TECH	5150	Franriere	<a href="http://www.pailletech.be">www.pailletech.be</a>	•			
PCIM	5590	Achene (Ciney)	<a href="http://www.isoproc.be">www.isoproc.be</a>	•			
PÉPINIÈRES LA GAUME	6730	Breuvanne-Tintigny	<a href="http://www.pepiniereslagau.me">www.pepiniereslagau.me</a>	•			
PIXAERO	5020	Namur	<a href="http://www.pixaero.be">www.pixaero.be</a>				•
PLANT DESIGN	1020	Brussels	<a href="http://www.plantdesign.be">www.plantdesign.be</a>	•			
POBRA	7060	Soignies	<a href="http://www.pobra.be">www.pobra.be</a>	•			
POZYX	9000	Ghent	<a href="http://www.pozyx.io">www.pozyx.io</a>				•
PROCOS GROUP	2018	Antwerp	<a href="http://www.procosgroup.com">www.procosgroup.com</a>				•
REAL DOLMEN	1654	Huizingen	<a href="http://www.real-dolmen.be">www.real-dolmen.be</a>				•
RECTICEL	9230	Wetteren	<a href="http://www.recticel.com">www.recticel.com</a>	•			
RENSON	8790	Waregem	<a href="http://www.renson.eu">www.renson.eu</a>				•
RESUS	2170	Merksem	<a href="http://www.resus.eu">www.resus.eu</a>				•
RETRIVAL	6010	Couillet	<a href="http://www.retrival.be">www.retrival.be</a>	•			
REYNAERS ALUMINIUM	2570	Duffel	<a href="http://www.reynaers.be">www.reynaers.be</a>	•			
ROCKESTATE	1040	Brussels	<a href="http://www.rockestate.io">www.rockestate.io</a>				•
ROMBIT	2000	Antwerp	<a href="http://www.rombit.be">www.rombit.be</a>				•
ROOSE PEETERS ARCHITECTS + U	1190	Brussels	<a href="http://www.roose.be">www.roose.be</a>	•			
RVC	5380	Fernelmont	<a href="http://www.rvc.be">www.rvc.be</a>				•
SAINT-GOBAIN CONSTRUCTION PRODUCTS BELGIUM	9130	Kallo	<a href="http://www.isover.be/www.gyproc.be">www.isover.be/www.gyproc.be</a>	•			
SCHNEIDER ELECTRIC	1180	Brussels	<a href="http://www.schneider-electric.be">www.schneider-electric.be</a>	•	•		
SEAFAR	2000	Antwerp	<a href="http://www.seafar.eu">www.seafar.eu</a>				•
SECA BENELUX	1070	Brussels	<a href="http://www.secabenelux.com">www.secabenelux.com</a>	•	•		
SENTIGRATE	3001	Leuven	<a href="http://www.sentigrate.com">www.sentigrate.com</a>				•
SHAYP	1040	Brussels	<a href="http://www.shayp.com">www.shayp.com</a>	•	•		
SKILPOD	2440	Geel	<a href="http://www.skilpod.com">www.skilpod.com</a>	•	•		
SKOPE	1070	Brussels	<a href="http://www.skope.be">www.skope.be</a>	•	•		
SKYLANEOPTICS	5650	Fraire	<a href="http://www.skylaneoptics.com">www.skylaneoptics.com</a>				•
SMARTNODES	4000	Liège	<a href="http://www.smartnodes.be">www.smartnodes.be</a>				•
SOLIDOR	8500	Wevelgem	<a href="http://www.solidor.be">www.solidor.be</a>	•			
SPACEWELL	2610	Antwerp	<a href="http://www.spacewell.com">www.spacewell.com</a>				•
SPEED BUILDING SYSTEM BELGIUM	3012	Leuven	<a href="http://www.facadeclick.be">www.facadeclick.be</a>	•			
STABILAME	5660	Mariembourg	<a href="http://www.stabilame.be">www.stabilame.be</a>	•			
STAENIS	9780	Olsene	<a href="http://www.staenis.com">www.staenis.com</a>	•			

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STARFISK	8310	Bruges	<a href="http://www.starfisk.com">www.starfisk.com</a>				•
SUEZ R&R BE NORTH	1082	Brussels	<a href="http://www.sita.be">www.sita.be</a>	•			•
SUMI	8501	Kortrijk-Heule	<a href="http://www.sumismart.com">www.sumismart.com</a>				•
SUNSOAK DESIGN	1000	Brussels	<a href="http://www.sunsoak-design.com">www.sunsoak-design.com</a>	•			•
SUREAL	1050	Brussels	<a href="http://www.sureal.be">www.sureal.be</a>	•			•
SWECO BELGIUM	1000	Brussels	<a href="http://www.swecobelgium.be/en">www.swecobelgium.be/en</a>	•			•
SYSTIMBER	9840	De Pinte	<a href="http://www.systimber.com">www.systimber.com</a>	•			
TECNIBO	1190	Brussels	<a href="http://www.tecnibo.be">www.tecnibo.be</a>	•			
TELESYS	9700	Oudenaarde	<a href="http://www.telesys.be">www.telesys.be</a>				•
THE RETAIL FACTORY	2000	Antwerp	<a href="http://www.theretailfactory.be">www.theretailfactory.be</a>				•
THIERRY GRAND-PERRET	1160	Brussels	<a href="http://www.isolermamaison.be">www.isolermamaison.be</a>	•			
THINGSPLAY	5150	Floreffe	<a href="http://www.thingsplay.com">www.thingsplay.com</a>				•
TPF ENGINEERING	1190	Brussels	<a href="http://www.tpf.eu">www.tpf.eu</a>	•			•
TRACTEBEL	1000	Brussels	<a href="http://www.tractebel-engie.be">www.tractebel-engie.be</a>	•			•
TRADECO BELGIUM	7700	Mouscron	<a href="http://www.tradeco.be">www.tradeco.be</a>	•			
TRANE	1160	Brussels	<a href="http://www.tranebelgium.com">www.tranebelgium.com</a>	•			•
U2PGROUP	3980	Tessenderlo	<a href="http://www.u2pgroup.com">www.u2pgroup.com</a>	•			•
UNAA	1180	Brussels	<a href="http://www.unaa.eu">www.unaa.eu</a>	•			•
UNIFLY	2100	Antwerp	<a href="http://www.unify.aero">www.unify.aero</a>				•
UNILIN INSULATION	8792	Desselgem	<a href="http://www.unilininsulation.com">www.unilininsulation.com</a>	•			
VAN HOUTVEN	9800	Astene	<a href="http://www.vh-houtbouw.be">www.vh-houtbouw.be</a>	•			
VANDERSANDEN STEENFABRIEKEN	3740	Bilzen	<a href="http://www.vandersanden.com">www.vandersanden.com</a>	•			
VERHAERT	9150	Kruikebeke	<a href="http://www.verhaert.com">www.verhaert.com</a>				•
VINÇOTTE	1800	Vilvoorde	<a href="http://www.vincotte.be">www.vincotte.be</a>				•
VK ENGINEERING	1070	Brussels	<a href="http://www.vkgroup.be">www.vkgroup.be</a>	•			•
WATTFACTORY	9000	Ghent	<a href="http://www.wattfactory.be">www.wattfactory.be</a>				•
WE SMART	1020	Brussels	<a href="http://www.wesmart.com">www.wesmart.com</a>	•			•
WECUBE	3150	Haacht	<a href="http://www.wecube.be">www.wecube.be</a>	•			•
WIENERBERGER	8500	Kortrijk	<a href="http://www.wienerberger.be">www.wienerberger.be</a>	•			
WINWATT	1000	Brussels	<a href="http://www.winwatt.eu">www.winwatt.eu</a>	•			•
WOOD HARMONY	1200	Brussels	<a href="http://www.wood-harmony.be">www.wood-harmony.be</a>	•			
YAZZOOM	9051	Ghent	<a href="http://www.ana.yazzoom.com">www.ana.yazzoom.com</a>				•
ZAPFLOOR	2018	Antwerp	<a href="http://www.zapfloorhq.com">www.zapfloorhq.com</a>				•
ZETAPULSE	2000	Antwerp	<a href="http://www.zetapulse.be">www.zetapulse.be</a>				•



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