ANNUAL REPORT
2020

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With the crisis behind us,

The unprecedented crisis of 2020 has shown that we live in a volatile world where everything is interdependent and where changes follow each other very quickly and sometimes abruptly. Businesses, including the BBRI, need to demonstrate resilience and creativity to adapt to this growing complexity. Which is why we put together our Give Me Five action plan, providing us with the levers with which to respond quickly to this new paradigm.

Our sector was hit hard by the first lockdown, when most construction sites were shut down. The economic consequences were enormous, confronting construction companies with new and specific needs. Being a high added value partner for them meant providing customized information and services adapted to the circumstances of the moment. We quickly realised that their needs related not just to technical and organisational aspects. Many questions also involved legal aspects that we are not used to dealing with. Cooperation with professional associations and other sectoral partners was therefore essential. Pooling our expertise ensured for greater impact and more effective help for our members. Many articles appearing in a special issue of our *CSTC-Contact* magazine were therefore co-signed by the *Confédération Construction*, the *Bouwunie* and *Constructiv*. This collaborative principle is the cement of Give Me Five and needs to be even further encouraged. We are convinced that together we are stronger and able to move forward.

On top of this, the current crisis has taught us many lessons and also accelerated the need to build a more sustainable world, based on a more circular economy. That is the essence of the European Green Deal, which actively calls on the sector to take up the challenge

Olivier Vandooren
Director General

Give M

it's time for great ambitions

of energy renovation and renewal of existing buildings. We should definitely not miss out on these real opportunities for business and growth, but at the same time we need to be aware of the responsibility that comes with them. For a more rational and economically sustainable use of natural resources and raw materials, we need to innovate at all levels.

We must also increase our productivity. We are helped by new technologies that are operational, and by the lean approach. These tools enable companies of all sizes to offer new services to their customers, improve their processes, reduce waste associated with poor quality and periods of inactivity (often synonymous with loss of profitability). This expected growth will require a larger workforce and also – for very heavy or repetitive tasks – the use of on-site robotisation or industrialisation. Combined with the greening of our image, a modernisation of the construction trades will make our sector more attractive and so encourage young people and future workers to seek jobs in construction.

2020 was a difficult and, emotionally and economically, far from normal year. A year in which it also became clear just how essential and urgent the transformation of the construction sector is for building the world of tomorrow. To demonstrate collective resilience in the face of this unprecedented situation, the BBRI wants to play an important role by being a sustainable, high added value innovation partner for contractors. Our 'Ambitions 2025' programme, based on the priorities of the Give Me Five action plan, will enable us to meet this challenge. We invite you to discover more about this in this annual report.

Johan Willemen
Chairman

> Co-creation is the best approach for a strategic vision on the future.

Johan Vyncke
Director Strategy and Innovation

Give Me Five

Co-creation is not a buzzword, it is the best way to achieve broadly supported results. A strategic vision for the future has impact only if a large group is willing to support and propagate this vision. In preparing 'Ambitions 2025', our strategic plan for 2025 (available via ambitions2025.cstc.be), the input of our colleagues and outside advice were therefore of crucial importance. These are the three main thrusts:

- SKILLED TRADES: making plans is one thing, but implementing them in the construction industry (with special attention to each building trade) is quite another. In that respect, the BBRI wants to throw its full weight into the fight to create more impact. In the coming years, we shall closely monitor how our ambitious plan is being rolled out and implemented
- GREEN DEAL: the sector is responsible for more than 40% of CO_2 production and use of natural resources. The circular economy, recycling of building materials, large-scale thermal insulation of existing buildings and smart water management are just a few elements that call for further development
- CONSTRUCTION 4.0: how could we ever have made it through the lockdown periods without efficient digital communication and collaboration processes? Also in our sector, where collaboration is essential, digitisation will accelerate innovations. Naturally, we are thinking in the first place of the digital exchange of information, but drones, cobots, virtual reality and artificial intelligence will very quickly be playing key roles.

I am confident that our plans will be implemented with good synergy and within a broad partnership.

Remaining operational throughout the year was one of our most important achievements in 2020. With a limited on-site presence and extensive teleworking, all laboratories and research groups were able to continue their activities. With clear safety instructions and measures, we were able at all times to respect the government's rules. We successfully organised major (virtual) workshops and conferences and our clients could always count on us.

We are also proud to have actively contributed to the success of several initiatives taken as part of the Give Me Five action plan. A good example is our internal selection process, aimed at ensuring that the projects we undertake perfectly match the BBRI vision, with maximum effect for contractors and construction professionals. In 2020, more than 50 small and large-scale projects were proposed and evaluated. On top of this, the creation of working groups involving universities and colleges is resulting in new perspectives for future partnerships.

Finally, we have been particularly active in sector-based discussions of regional recovery plans and have made proposals on research, development, and the demonstration and adoption of innovation. Ambitious project proposals were formulated around essential themes such as circularity and energetic renovation. We also participated in the first call for projects under the European Green Deal with three project proposals.

In short, 2020 was a special but certainly not a lost year. On the contrary, we were at the service of contractors all year round, and with what we have achieved hope to do even better in 2021.

2020 was an out-of-the usual year: our colleagues from the Research and Development department took up the challenge.

Jan Desmyter
Director Research and Development

Fabrice de Barquin
Deputy Director Research and Development Scientific Adviser

Give Me Five

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COVID-19 emphasised the importance of clear and reactive communication.

Jörg Wijnants
Director Information and Companies Support

Give Me Five

The corona crisis emphasised and increased the importance of clear and reactive communication. For example, during the first lockdown, we released a special edition of *CSTC-Contact* to provide a clear answer to questions coming from construction companies. A special COVID page was added to our website to collect all relevant news items, which were also sent out at greater frequency via the BBRI mail. In addition, we used social media to get news quickly to our target audience. We also recorded a series of short webinars with which contractors could easily update their knowledge on various technical aspects.

In addition to information on technical aspects and business management, indispensable legal and security information also had to be disseminated. For this we worked closely with various partners and professional organisations. In this way, despite working from home, we grew closer to each other as we sought to provide contractors with appropriate and complete information.

Of course, this difficult period did not lead us to lose sight of our basic missions. The planned publications (Technical Information Notes, Dossiers, etc.) continued to be published on time and our training courses and personalised services were also continued. Thanks to modern means of communication, even site visits could take place in remote mode.

In short, in 2020 we learned to handle constant changes quickly and flexibly so as to be able to offer the right information and support. A valuable lesson for the future.

Maybe 2020 was the year of online meetings for your company too. With the corona crisis, this aspect of digitisation suddenly gained momentum. But we will have to shift up a gear to lower costs and thus increase productivity.

The implementation of 4.0 technologies can provide solutions, with tomorrow's collaboration making extensive use of BIM. In this way, a project is digitally optimised before being actually built, which means less information loss and fewer mistakes. New technologies (scanners, drones, construction industrialisation…) represent not only challenges, but also opportunities for all construction professions.

With, among other things, guidance, training and demonstrations, the BBRI is keen to motivate contractors to transform themselves digitally. Our two mobile demonstration hubs were delivered in 2020 and are now ready to bring the new technologies onto the construction site. In this way contractors can test them in live situations to gain a precise picture of their added value. Our advisers assist them in assessing the return on investment of the different technologies, but also in evaluating their levels of maturity or the time investment required (e.g. training). BIM is clearly one of these technologies. Large-scale implementation of BIM requires numerous collaboration conventions between the different partners. We have already published several of these (BIM protocol, BIM execution plan, information delivery specifications between the different parties…). The recently published Modelling Agreements will gradually be supplemented with other basic documents. The BBRI's information-sharing toolkit was also expanded, with the first version of the BIMio viewer made available to construction professionals free of charge. This viewer will be supplemented with trade-specific applications, enabling the various construction trades to use the possibilities of BIM according to their needs.

Applications tailored to the different construction trades meet your company's needs too!

Bart Ingelaere
Deputy Director General
Director Information and Management Techniques

Give Me Five

A robust set of specifications to ensure that you can work with confidence.

Peter Wouters
General Adviser

Eric Winnepenninckx
Deputy Director
Standardisation and Certification

Give Me Five

Several studies show the economic importance of standardisation. This is once again emphasised in a study on the impact of standards on the Belgian economy, commissioned by the Belgian Bureau for Standardisation. According to this study, each new standard increases the country's gross domestic product by about two million euros.

It is therefore not surprising that the unified technical specifications (STS), that is the type specifications issued by the FPS Economy, make frequent use of the whole range of product, assessment and design specifications that standardisation offers.

Over the past year, an internal BBRI working group examined how to achieve the coherent combination of the complementary package of STSs, BBRI Technical Information Notes and standardisation as the driving force of the digital construction environment of tomorrow. The working group also examined how contractors can make better use of these instruments and become more involved in developing them.

All players in the Belgian construction sector bear a heavy load of responsibility for the works they carry out. This makes having a robust set of design and execution specifications, supplemented by certification where necessary, a way for designing, prescribing, executing and checking constructions with confidence.

The technical approvals (ATG), which go hand in hand with product certification, are issued by the Belgian Union for Technical Approval in Construction (UBAtc/BUtgb). Traditionally, the BBRI has provided the Union's secretariat and contributed its expertise. A further digitisation of the services is a priority here. Innovation remains an important field of activity and the Patent Unit (OCBC) is therefore a useful tool for BBRI members.


HET METIER
APPROCHE MÉTIER
GREEN DEAL
BOUW 4.0
CONSTRUCTION 4.0

Customised communication for contractors

CSTC Contact

Une édition du Centre scientifique et technique de la construction

Daniel Ferrer Plaza / Shutterstock

Hors-série COVID-19
Le secteur relève le défi !

The magazine *CSTC-Contact* is sent out every two months to more than 100,000 businesses.

Despite the uncertainties caused by the corona crisis, this publication continued to appear regularly and on time. To meet as far as possible the needs of the contractors affected during the first wave of COVID-19, we published a special issue in May 2020 devoted entirely to the challenges of resuming work after the lockdown. From technical articles, for example on reactivating sanitary installations after a long period of inactivity, to the financial management of companies or the planning of construction sites, we tried to provide concrete answers quickly, while maintaining a strict methodology. The urgency of this information certainly did not compromise its quality. Several articles were written in collaboration with our partners (*Confédération Construction*, *Bouwunie*, *Constructiv* ...), who gave us access to their practical expertise.

To complement our communication, we have also hosted numerous webinars (80 so far). Topics were chosen based on suggestions coming from contractors through the Technical Committees or the professional federations. For the sake of efficiency, we have opted for short, very practical webinars. The formula is clearly popular, as some webinars were viewed more than 1,000 times.

> “Answering contractors’ questions quickly and concretely is completely in line with the Give Me Five action plan.

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The future of the construction sector lies in greater circularity

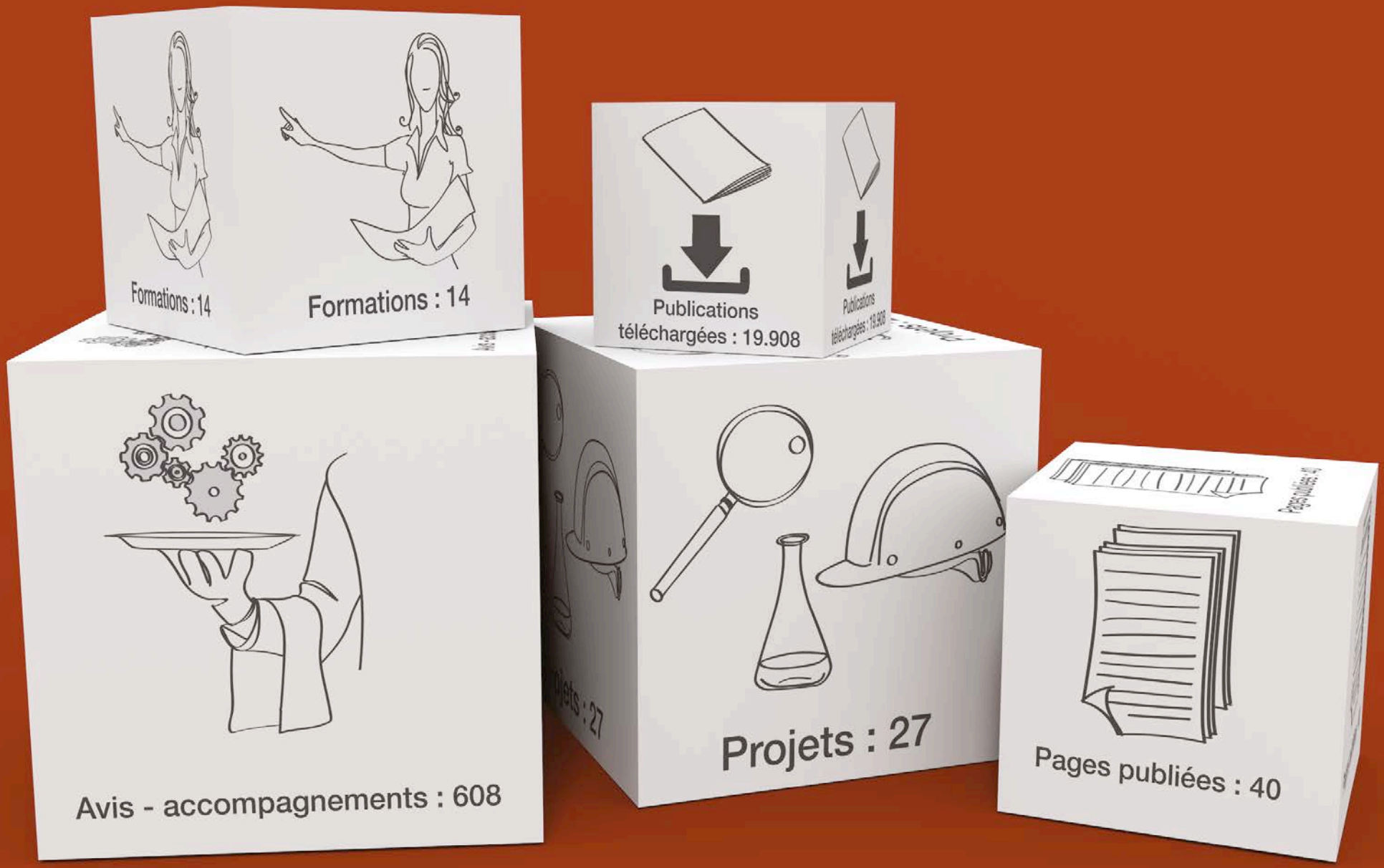
As one of the largest consumers of materials and energy, the construction sector has every interest in moving towards a circular economy, which attempts to preserve materials and their value as much as possible. In this way it contributes to the three p's of sustainable development: people, planet and profit.

At the start of 2020, we devoted a full issue of *CSTC-Contact* to the circular economy in the construction industry. We discussed new ways of building with flexibility and reversibility, circular materials and solutions with a lower environmental impact, recycling and reuse of construction and demolition waste, new business models and the use of digital tools. At our Summer University we again familiarised contractors with concrete solutions, existing and new. We closed the year with an event organised as part of the activities of the Vision Committee. At this event, architect *Thomas Rau* and other experts looked ahead in a debate to 2030 and the effective implementation of the circular economy.

Our research projects are intended to support contractors and actively encourage them to innovate. In the 'Build Circular. Brussels' project and C-Tech support service, together with the *Confédération Construction*, we guide contractors towards more circular offerings. With 'Digital DeConstruction', we focus on digital tools for the recycling and reuse of demolition materials. Further on in this annual report you can also read more about 'Circular.Concrete' (reducing the impact of concrete) and 'CBCI' (Circular Biobased Construction Industry).

> Circular construction serving people, our planet and companies.

Environment and circular construction



‘Circular.Concrete’ shows the way to innovations for more circular concrete

Concrete is one of the most commonly used materials, but its production requires large quantities of raw materials and creates heavy CO_2 emissions. Circular economy principles can therefore provide great added value here. Many technological innovations already exist or are under development, but more technical knowledge and practical experience are needed. It is from this consideration that the ‘Circular.Concrete’ project came into being.

We first mapped out the available technologies in a state-of-the-art report. We then selected a number of promising technologies for small-scale laboratory research. This allowed us to gain experience with smart crushing technology, with the treatment of recycled aggregates by means of carbonation, with the maximum replacement of natural aggregates by recycled and artificial aggregates and with the use of alternative binding agents (e.g. geopolymers) and cement substitutes.

In 2020, we accompanied and monitored various pilot sites where innovative circular technologies were being applied. On some of the sites, detailed LCA analyses were performed to verify the environmental gains achieved. Assessments were also made of the practical implications of the circular technologies applied, with proposals to overcome barriers to their use (e.g. descriptions in contract specifications, economic analyses).

The project gives the construction sector the substantiation it needs to start operating, in full confidence, with the new materials and technologies that fit within the circular economy.

> The ‘Circular.Concrete’ project has given the construction sector greater confidence in new circular materials and technologies.

Promoting the transition to a circular economy and to CO_2-neutral construction

The transition to a circular economy and increased use of bio-based materials are among the political and sectoral priorities for achieving CO_2-neutral construction. For this reason the BBRI actively participates in the 'CBCI' (Circular Bio-based Construction Industry) project, launched within the framework of the Interreg '2 Seas' programme, which is involving ten European partners.

This project, started in 2019, allowed us first of all to list materials of biological origin and then to identify the most widely used in the partner countries. These insulating materials (such as flax and even meadow grass) have already been integrated into a test wall, which will allow us to study their performance and behaviour over time.

A lot of effort was also devoted to establishing a legislative and normative inventory of bio-based materials at national and European levels. On this basis, we shall initiate characterisation studies of these products (moisture regulation, acoustic performance, mould development...) and proceed to the analysis of their life cycles.

By the end of the programme, in mid-2022, we should therefore be in a position to establish best execution methods and a clear and harmonised normative framework and to develop bio-based building elements that can be manufactured on an industrial scale.

To inform companies about the nature of the project, an information video was placed on the CBCI site (www.CBCI.eu). In each new phase, a summary document will also be placed online on the project and BBRI websites.

> In the longer term, the CBCI project will facilitate the production of bio-based circular economy products on an industrial scale.

Correctly measuring and evaluating the environmental performance of buildings

Life cycle analysis (LCA) enables us to measure and evaluate the environmental performance of buildings. The objective of the B-LCA prenormative research project is to refine the methodological framework for LCA studies of buildings to allow unambiguous assessments. At the same time, we are keen to gain a better insight into the environmental performance of Belgian buildings and identify the points for attention.

Several standard-type Belgian homes with different energy ambition levels were analysed in 2020. The results show the significant contribution made by building materials, technical installations and energy consumption to the total impact of these homes over their entire lifespans. This exercise allowed us to estimate the environmental benefits achieved by various renovation interventions and to map out the differences with new buildings. It also gave insight into the environmental impact of technical installations for heating, ventilation, sanitary (hot) water and rainwater use. On this basis, we were able to draw up an action plan for the environmental assessment of these installations at individual building level.

In addition, we are committed to developing relevant and unambiguous calculation rules, for example, to take into account the effect of renewable energy or to measure the environmental impact of circular solutions. In this way, the project contributes to both European standardisation and the Belgian calculation tool TOTEM, and offers construction professionals a tangible framework for determining and optimising the environmental performance of buildings.

> B-LCA: an extra step towards optimising the environmental performance of buildings.

The BBRI has won two awards for two articles it published based on results obtained during the B-LCA project.

Stimulating the circular economy in the construction sector

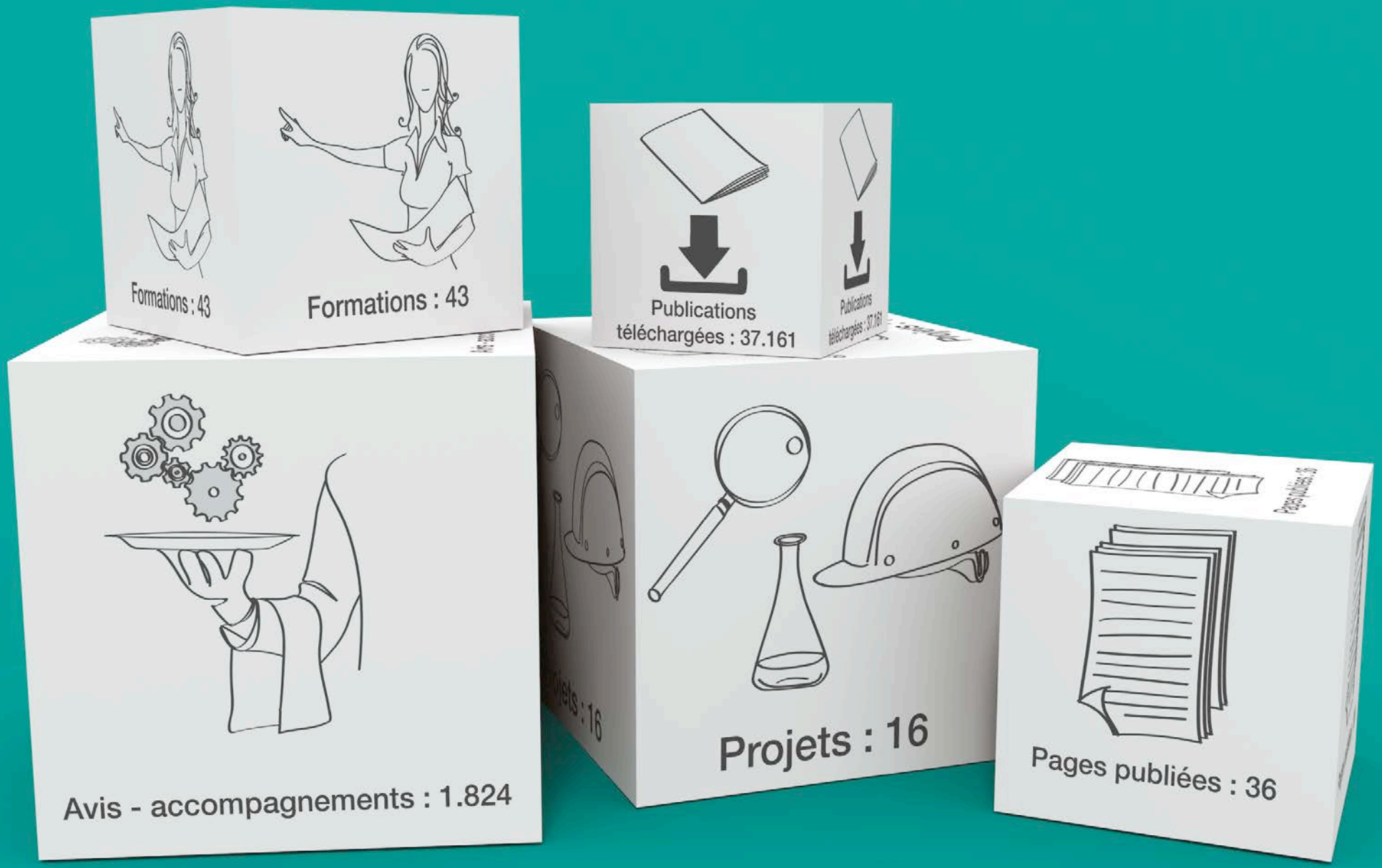
With our now customary *Summer University* we inform the sector about the latest trends. That is why in 2020 the programme was dedicated to the circular economy in construction. In view of the current environmental challenges, increasing attention is being paid to this theme: the correct use of materials, their value, their reuse or recycling, but also the adaptability and sustainability of buildings.

In this context of innovation and transition to more sustainable construction methods, the contractor plays a decisive role in the concrete application of these concepts. It is at this level, therefore, that support needs to be given. Thanks to feedback from earlier editions, the programme, subdivided into three themes, was target-oriented, informative, innovative and practical. This edition also marked the kick-off of 'BuildCircular.Brussels', confirming BBRI's collaboration with the *Confédération Construction Bruxelles-Capitale*. This ambitious project, supported by the Brussels-Capital Region, aims to provide construction companies with concrete assistance in transitioning to greater circularity.

The 2020 edition, which took place in virtual mode owing to the corona crisis, ended up reaching a wide audience: 250 people at the time and a lot more subsequently because the lectures were made available via YouTube.

> The *Summer University* is a launch pad for circular construction.

Comfort, health and safety



A kit for rapid detection of asbestos on site

The BBRI's 'Mineralogy and Microstructure' (MIC) laboratory is undoubtedly one of the best equipped in the country with state-of-the-art microscopes, enabling it to analyse inorganic materials in great detail. It operates in perfect synergy with the BBRI's other research laboratories, putting its expertise and equipment at the service of companies in the sector to study various pathologies detected on site: cracks in stones, efflorescence on bricks, determining the composition of stone and concrete ...

The presence of asbestos on a construction site is certainly one of the biggest problems faced by construction professionals. For this reason we have teamed up with a biogeology start-up to conduct a feasibility study into fast and innovative solutions to detect this material on construction sites. This research project, named 'Adekit', demonstrated the validity of the concept of using peptides to detect the presence of asbestos, and led to two patent filings.

Based on the results, the MIC laboratory continued the project ('Adekit II') in the last quarter of 2020, with the aim of industrial development of a low-cost detection kit valid for the six types of asbestos that are found in situ in approximately 3,500 building products. Many companies, some of which from abroad, have already expressed interest in this kit.

"

A simple asbestos detection kit that can be used on site is a practical tool for many companies.

Combating legionella starts with correct sampling

Recent analyses of legionella bacteria in various installations and the outbreak in 2019 due to a contaminated cooling tower, have emphasised the importance of correct sampling in both sanitary and industrial installations. A first but crucial step in the analysis of the legionella problem is to take samples that are representative of the water present in an installation.

In the early 1990s, the BBRI set up the 'Microbiology and Microparticles' (MBP) laboratory to investigate the legionella problem in sanitary installations. This lab is accredited by BELAC (the Belgian Accreditation Institution) and by VLAREL (the Flemish Regulation on Environmental Licensing) for the analysis of legionella bacteria in water. In 2020, the lab also received BELAC accreditation for sampling. This makes it one of eight labs with VLAREL accreditation for legionella sampling and waste water analysis.

We also work with VITO (the Flemish Institute for Technological Research) in order to improve analysis techniques.

The correct design, use and management of installations is the key to controlling the spread of legionella and requires a technically solid approach. Close tracking of scientific, technical and social developments makes the MBP lab, together with the 'Water Technologies' lab, the ideal partner for contractors and building managers.

> Sample selection is a crucial step in combating legionella.

New online training in building acoustics

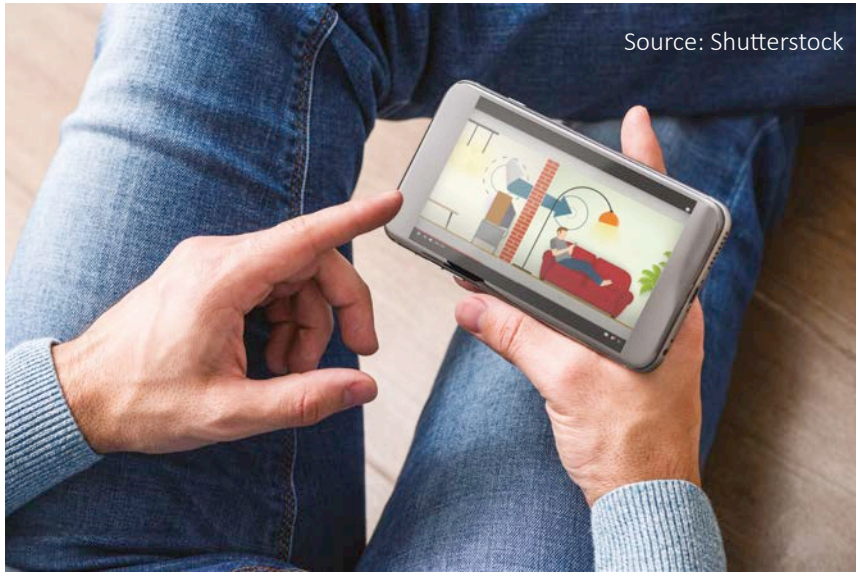
In 2020, the demand for remote training strongly increased as a result of the pandemic. The Acoustics research group has responded by significantly expanding the range of training courses and information in the field of building acoustics. A deliberate choice was made for contractor-directed information in a maximally attractive format.

In seven webinars, we discussed a wide range of themes: basic concepts of building acoustics, principles for good sound insulation of single and double partitions, execution errors in floating screeds, high acoustic performance timber frame construction and terraced houses and, lastly, noise from mechanical ventilation.

In addition, a short animation specifically presented the five basic criteria of building acoustics: air and impact sound insulation, façade insulation, installation noise and reverberation control. The acoustic variables used in the assessment of these five criteria were also very clearly set out in five information sheets, which can be found on the website of the *Antenne Normes* (Standards Antenna) Acoustics. This site also examines how these acoustic quantities are measured, both in the laboratory and in situ.

Finally, a number of solutions for potential sound insulation problems in façade renovation were presented in 'Infofiche 91' (available on the BBRI website).

> As a result of the pandemic, the training offer also had to be adjusted.



Source: Shutterstock

A new Technical Information Note to clarify the fire safety of curtain walling

Belgian legislation on the fire safety of façades will shortly be changing. The BBRI has therefore developed a new Technical Information Note (TIN/NIT) to give construction professionals guidelines for designing and building curtain walls that comply with fire safety standards.

The Note looks mainly at the flame screens that need to be placed in a façade to prevent fire spreading between storeys. In 2020 we provided type details for different kinds of flame screens (cantilevered, incorporated into the façade, lining the façade at floor level on each storey). The Note indicates which method the contractor can use. If the situation is not conform to the designed standard details, fire tests can be carried out. The document also describes the legislation, making it a tool for architects to process the standard-type details in their designs.

In producing this Note, our internal departments worked closely together in various fields: fire regulations, acoustics, hygrothermics, etc. Our drawing office sketched out the type details. However, this document would not have been possible without additional external input. Contractors shared experiences and needs, and we were also able to count on the help of control offices, the Belgian Interior Ministry (for the legislation), the Institute for Fire Safety and other agencies. Sitting all these different parties around a common table, we were able to produce a document that is supported by the entire construction sector.

> Extensive collaboration has led to turnkey curtain wall solutions that meet fire safety standards.

‘Changing Minds’

The Belgian population is ageing. At the same time we all want to go on living in our own homes as long as possible, even in old age. However, this poses enormous challenges for society as a whole. The construction sector has an important role to play with regard to one of the more practical issues: how do we make and keep homes suitable for the elderly?

This theme was investigated in the ‘Changing Minds’ Tetra project, a collaboration between the BBRI and the Care Innovation Expertise Centre of the PXL University of Applied Sciences and Arts (Hogeschool PXL). Together, the two organisations examined what information on living longer in one’s own home is needed for those whose job it is to advise, design and implement building projects and how this information is best made available.

The past year was spent mapping existing actors and initiatives. In addition, various tools were inventoried that can be used throughout the whole construction process, including checklists, databases and virtual and augmented reality. The needs of the target groups were identified through surveys and focus groups. Finally, an online workshop was held on labelling, certification and quality marks, seeking to answer the question: how can construction companies distinguish themselves in this area?

All these initiatives aim at motivating the sector to tackle the challenge of living at home for longer.

> How do we, as a construction sector, make homes suitable for people to continue living at home for longer?

Source: Shutterstock

Increased number of resolved cases, including in the comfort and safety area

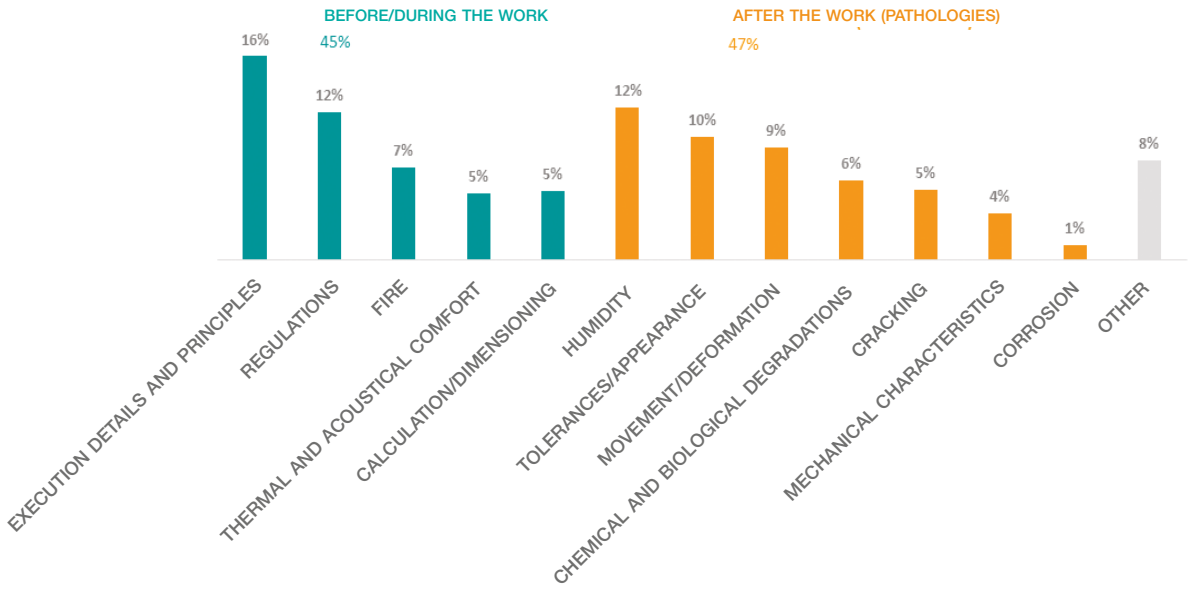
The coronavirus crisis has inevitably changed the way we support the industry. The BBRI's 'Technical Advice' (ATA) department has adapted in order to ensure the continuity of its services, while guaranteeing the safety of everyone.

With teleworking imposed on a large scale by the government, meetings on construction sites had to be suspended from the first lockdown onwards. Fortunately, the ATA was able to rely on new means of communication and the performance of its CRM system to organise virtual meetings. Only extremely urgent journeys and expert studies could still be carried out, with strict observance of the health measures. Outside the lockdown period, we saw these site visits significantly increase by as much as 18%.

Our statistics show that the number of cases solved by ATA grew by 0.8% in 2020 compared to the average of the three previous years. These data also indicate a 3% increase in the number of written notices sent. In this context, our engineers have also taken training in clearly drafting these recommendations and making them more readable. Analysis of the satisfaction forms confirms the positive effect of this training on the clarity and usefulness of the advice provided.

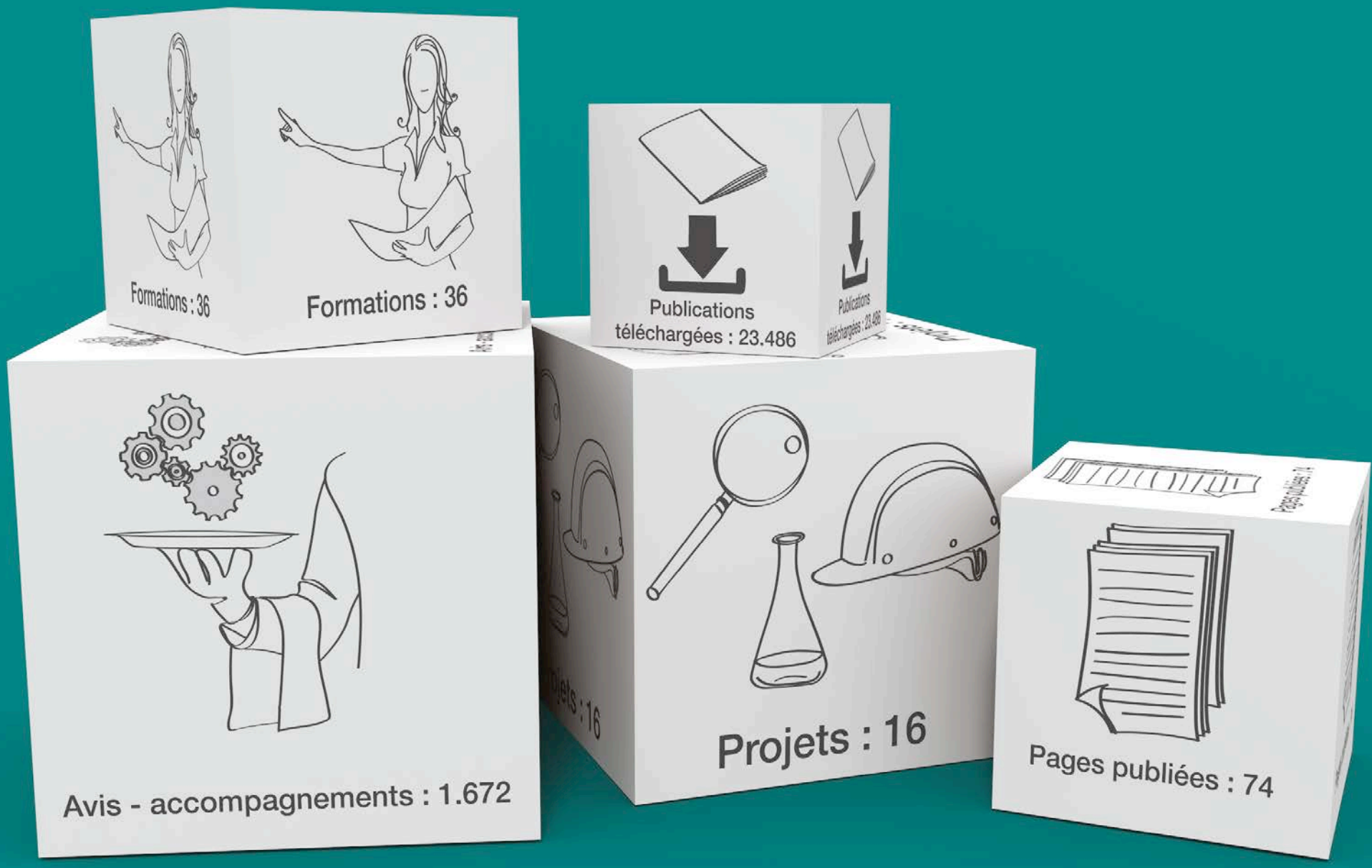
Finally, the number of telephone calls decreased by 5% during the lockdowns, owing to the reduced activity. Outside these periods, on the other hand, this number increased by 2.5%.

Nature of the questions asked of the department in 2020



Despite the health crisis, we succeeded in maintaining our services.

Technical installations



Optical fibre for structural monitoring

Fibre optic sensing has undergone an enormous evolution in recent decades (accuracy, reliability, affordability, etc.). However, its breakthrough in the construction sector was held back by a lack of detailed knowledge and doubts as to the feasibility of this technique.

At the same time, however, more and more attention is being paid to the durability, performance, efficiency and lifespan of construction works and systems. This also increases the need to monitor existing and new infrastructures and to perform quality checks. Optical fibre sensor technology offers many possibilities in this area as a supplement or as an alternative to monitoring techniques using more conventional sensors.

The BBRI therefore started a project in 2020 to boost companies' knowledge of optical fibre technologies and their use in structural applications of buildings. A test campaign was also launched with various real-scale optical fibre sensor technologies in reinforced concrete beam elements. Additionally, we set up three demonstration projects in collaboration with several companies, organised a workshop and laid the foundation for a database of cases.

The knowledge gathered in this way will enable companies to use this technology in specific projects and applications, potentially offering them a distinctive advantage over their competitors.

Find out more about this project at www.ovmonitoring.be.

> Optical fibre sensor technology is the solution for monitoring and controlling the quality of infrastructure works and building systems.

Using drones to automate construction inspections

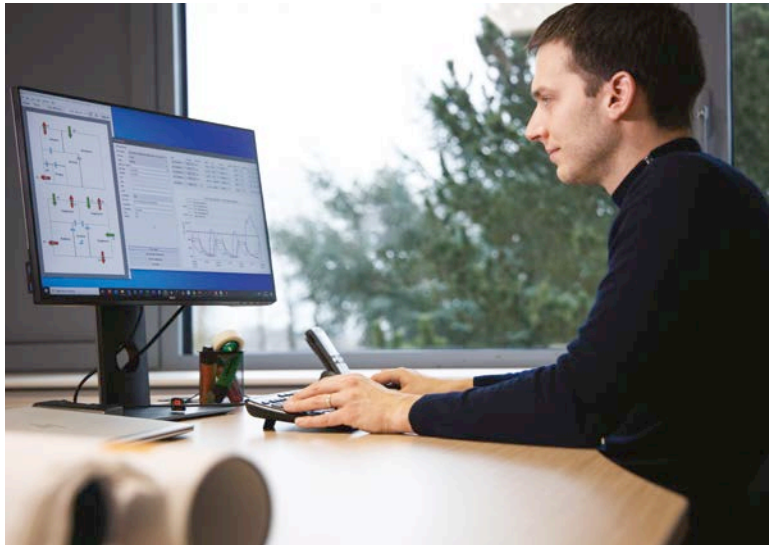
Inspecting a wind turbine, checking a bridge, digitally documenting the location of waste pipes on a parking garage site... A drone combined with various digital measuring techniques offers better visibility than the human eye. Drone techniques and digital measurement techniques come together in the 'AutoDrone' research project. The BBRI is working with several partners, in particular with the University of Antwerp, on this project, which is looking at possibilities for automating the use of drones.

At the same time, we are developing a tool to map and monitor the state of a construction. In addition, research is being conducted into photogrammetry and laser scanner techniques with which to create accurate 3D models of structures.

A good example of the possibilities offered by the combination of both techniques is the measurement carried out last year of the transition pieces for wind turbines of steel constructor Smulders. The drone has to travel a specific trajectory in order to correctly view all parts of a large construction such as a wind turbine. Automating this process saves a lot of time for the contractor and makes it easier to compare scans. On the other hand, the transition pieces require specific scanning techniques. Given the very smooth nature of the surfaces, recommendations were made to supplement the drone with a terrestrial laser scanner. The combination of images produced by the laser scanner and the drone served to map the transition pieces in a clear and efficient manner.

> With a drone and various measuring techniques, you at times see more than with the human eye.

COMISVENT: innovation in ventilation



> The ‘performance-oriented’ method supplements the descriptive approach of the current standard.

The present standard applicable to residential ventilation systems describes pretty precisely the acceptable systems: flow rate for each room, size of the openings ... In our opinion, this approach is not, however, without its limitations, as it does not necessarily guarantee good air renewal in all circumstances.

The COMISVENT (design and commissioning of ventilation systems) project is based on technological advances, especially in the field of sensors and control. Its goal is to develop a ‘performance-oriented’ calculation method to complement the current, more descriptive approach. This result-oriented calculation would make it possible to check the performance of both innovative and traditional systems in any situation.

2020 was the first year of this two-year project. Already we have designed a calculation tool that can simulate any ventilation system, even those that have not yet been developed. In 2021 we will be focusing on fine-tuning the parameters of our model. Our goal is to help every ventilation system designer (installer, general contractor and architect) go off the beaten track by offering the customer innovative solutions.

Safe, efficient and comfortable installations for domestic hot water production

There is currently no unequivocal Belgian method recognised by the sector for determining the heat load of installations for the production of domestic hot water. This shortcoming regularly causes discomfort, reduced energy efficiency, unnecessary space occupation, loss of water quality...

The main purpose of 'OptiDim' is to supplement the NBN EN 12831-3 standard with national data that will allow more reliable calculations. The second objective of this study relates to the European part of this standard and aims to improve the method itself, including drawing up a tap profile for an individual house and reviewing the tap profile of a building in function of the number of apartments.

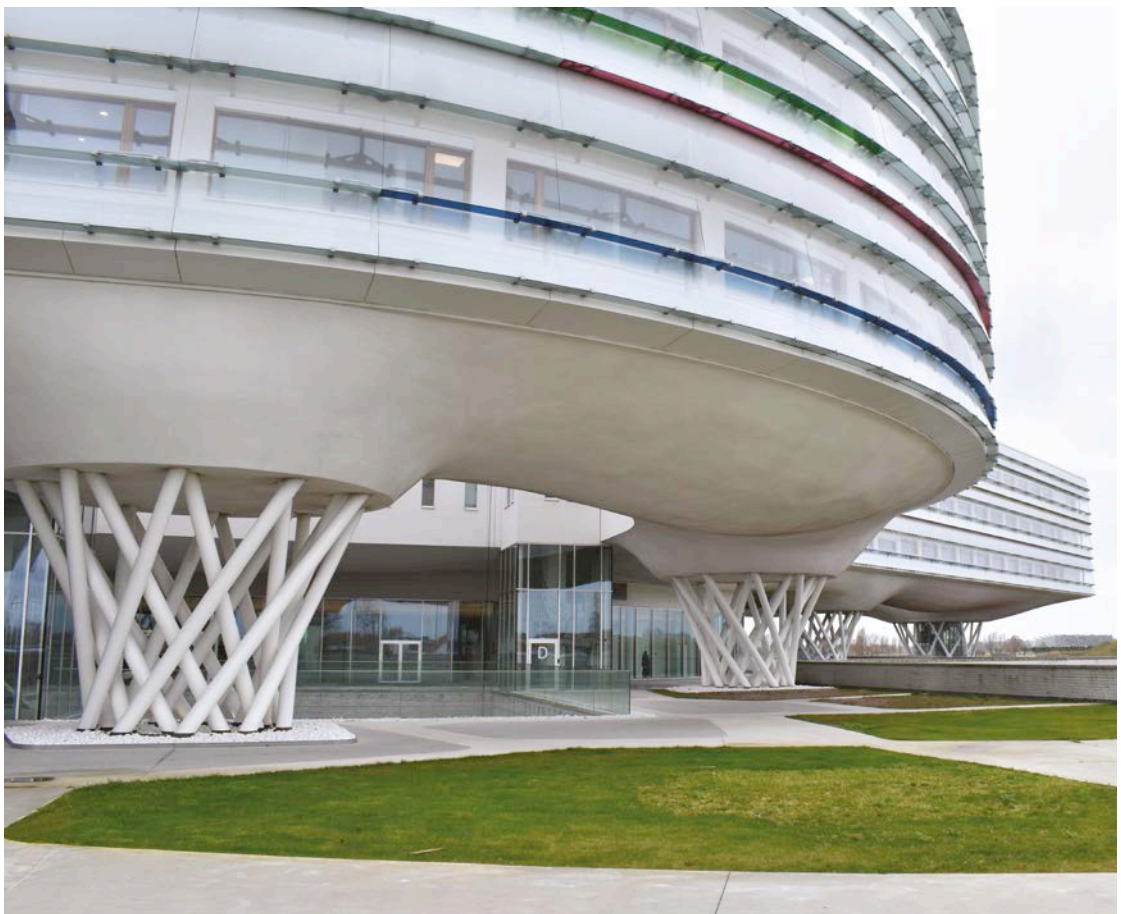
> The development of a reliable calculation method is a major challenge for the entire sector.

In 2020, our researchers took several actions:

- carrying out consumption measurements in homes, hotels and rest homes
- comparing a dozen different sizing methods to determine their advantages and disadvantages
- creating a library of hydraulic diagrams, containing standard production types and a list of parameters that affect the dimensioning (for later sensitivity studies).

‘Smart Buildings Illustrated’

> Concrete examples are intended to inspire contractors to erect smart and sustainable buildings.



This annual report focuses on digital technologies and new applications that can be useful before or during construction. But what about the other options that can be integrated into the buildings themselves? The ‘Smart Buildings Illustrated’ project uses real-life cases to provide examples of new technologies that work effectively during the use of a building.

In 2020, the project, which will also continue through 2021, examined, among others, the AZ Zeno hospital in Knokke. Here, for example, sensors were placed on all windows to monitor their opening and closing. In combination with the data from climate control, this can prevent rooms from being heated or cooled while a window is open, leading to better energy performance of the building.

Such concrete examples are intended to inspire contractors and by extension the entire construction sector. In this way, the buildings they erect not only deliver better energy performance, but also increase management and maintenance quality, improve comfort and the interior climate, optimise the user experience and reduce the total life cycle cost.

A number of cases can already be found via the following link: www.smartbuildings-inuse.be/case-study/. The webpage will be further supplemented in the course of 2021.

Construction 4.0 and management

FENESTRio facilitates the application of standards

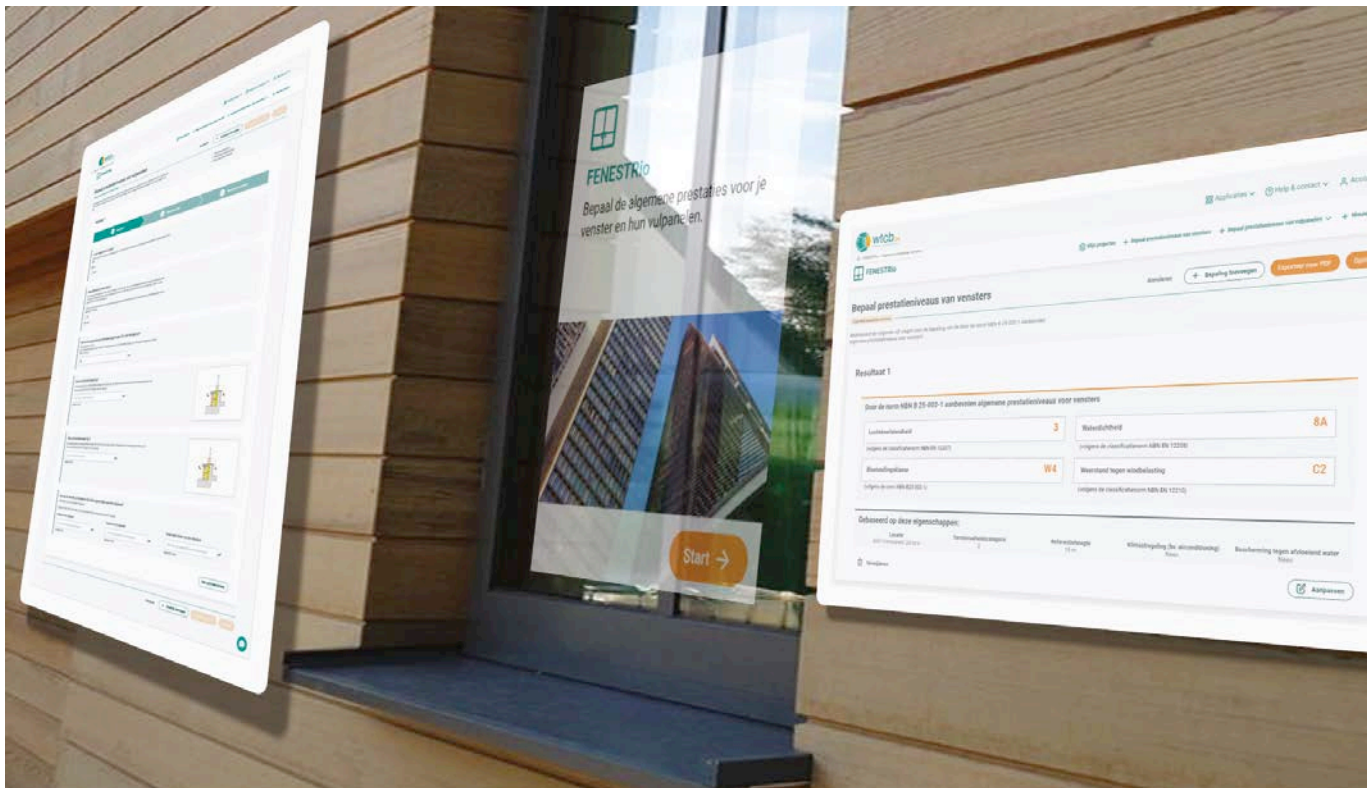
FENESTRio is a new application by the BBRI that was finalised in 2020. With this tool, contractors, architects and other construction professionals can easily calculate the performance levels for windows and filler panels recommended by the standard NBN B 25-002-1. This can be done by answering a number of questions in the tool. Where windows contain glass filler panels, the application can also be used to determine the breakage type of the glazing in accordance with the NBN S 23-002 standard.

The results obtained with the tool allow the user to choose the most suitable window system for a particular construction project. As a joiner or window constructor, you can also prepare an optimal price offer in this way.

The application lowers the threshold for consulting the normative documents NBN B 25-002-01 and NBN S 23-002, encouraging joiners to learn about these important standards and helping to avoid misinterpretation of the requirements and recommendations they contain. In addition, the tool supports them in adapting to a BIM context.

FENESTRio is the result of a thorough collaboration between various BBRI departments. The project was led by the 'Acoustics, Façades and Joinery' department, in close collaboration with the 'Digital Construction' department and the Technical Committee 'Joinery'.

> FENESTRio helps the user choose the most suitable window system.



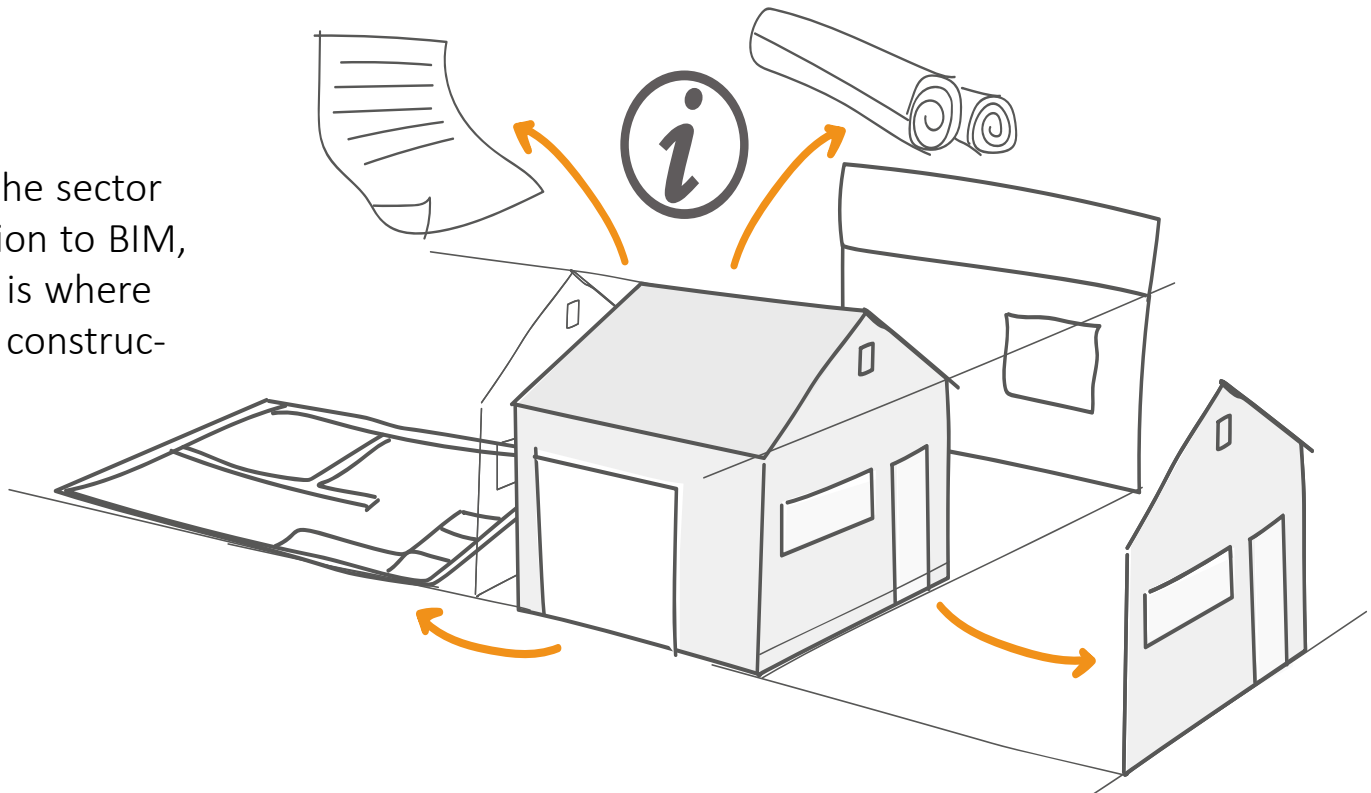
Developing and facilitating the implementation of BIM in Belgium

'CODEC II' is the follow-up to 'CODEC', a prenormative project supported by the FPS Economy, aimed at promoting and expanding the use of BIM in Belgium. BIM (Building Information Modelling) is a structured collection of information related to a building that is modelled in 3D, a kind of digital copy of the building. This collaborative tool represents a major innovation for the industry, with benefits for all phases of the construction process and for all parties involved, provided they all know how to make the best use of it.

The project aims to simplify the implementation of BIM as much as possible. In 2020, the research was expanded, in particular in the field of harmonisation of BIM modelling methods, the enrichment of generic objects and automatic checks of digital models. This project also embraces other themes, such as:

- producing up a BIM vision document for the client
- giving consideration to revising measurement codes, that are less adapted to the technological developments and automation possibilities that BIM offers.

> We support the sector in the transition to BIM, because that is where the future of construction lies.



With ‘BIMy’ towards intelligent and collaborative urban planning

The ‘BIMy’ project supplements BIM (a tool for the digital representation of construction works), offering the prototype of a collaboration platform that combines BIM and GIS (Geographic Information System)-sourced data. This platform, dedicated to contractors, designers and public authorities, is open to all BIM partners and users for sharing, storing and filtering models from this huge digital database.

In addition to good collaboration, the main challenge of BIMy is to integrate GIS data into BIM to give actors in the field an even more concrete and precise visualisation of the model they are working with, by placing it in its built and natural environment. The platform is currently used to model single buildings, but can potentially be extended to larger scale applications (e.g. smart cities).

Looking to the future, this project has the advantage of bringing together all the parties necessary for the success of the platform. It combines the resources and infrastructure of large companies, the know-how and practical knowledge of smaller companies, and the support of the research partners.

2020 provided the opportunity to experiment with the concept and demonstrate its feasibility, with encouraging results.

Source : @Assar/@GIM

> The platform will provide a secure collaboration environment for all stakeholders.

‘ConstructionSiteVision’: which applications for virtual reality?

> This project explores the potential of virtual reality.

Digitally visualising different types of window and door frames on a construction site. Sounds unreal? The ‘ConstructionSite-Vision’ testing ground brings what initially looks like futuristic digital applications close to the contractor. Virtual reality (VR), augmented reality (AR) and mixed reality (MR) can be of great value to the construction industry.

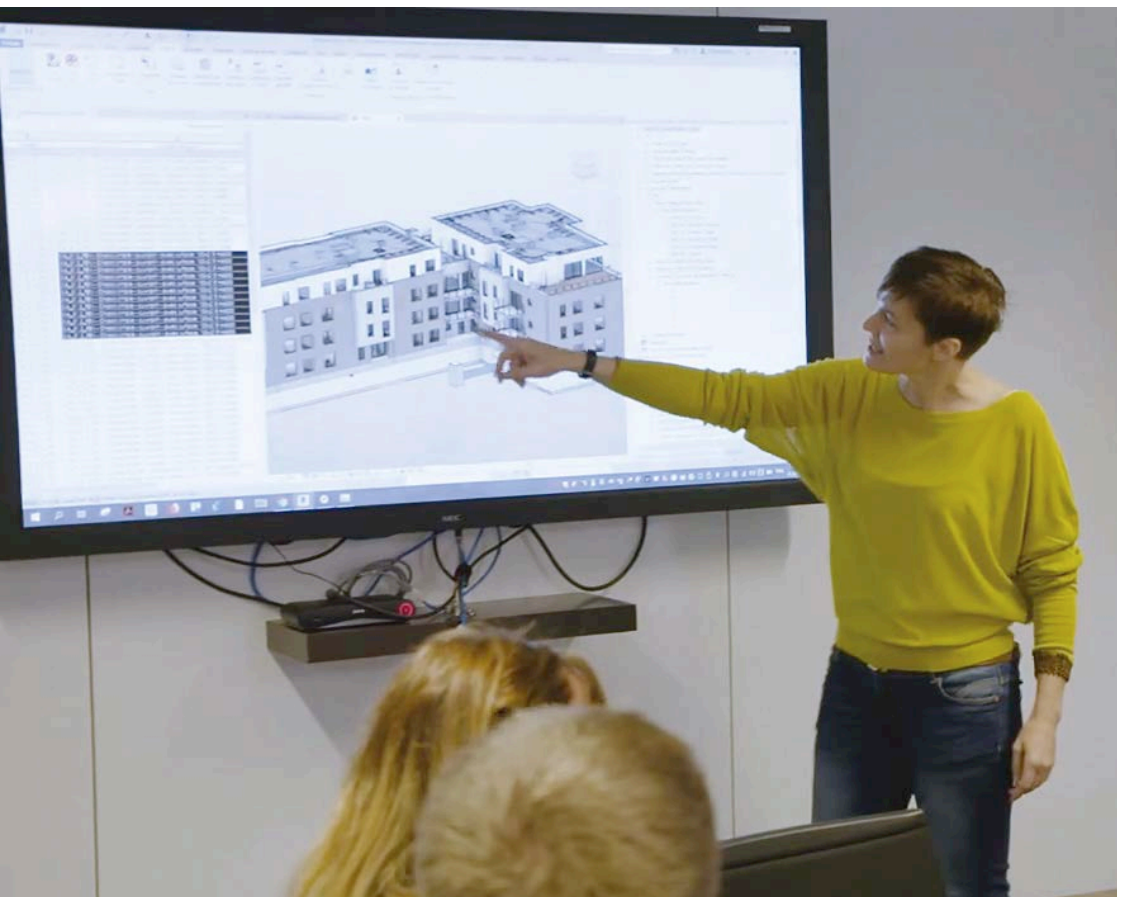
The aim of the testing ground is to explore the potential of AR and VR in construction. In this way, the construction and technology sectors are also brought into mutual contact. This can not only inspire and encourage construction companies to use new applications, but it can also lead to innovations created with input from the sector.

During the past corona year, most physical ‘ConstructionSite-Vision’ meetings had to be called off. Nonetheless, three workshops and six webinars took place online. The webinars included an introduction to augmented reality, an explanation of how to choose the right hardware and a demonstration of how to import a BIM model into a virtual environment. Each workshop revolved around a specific case that was discussed in detail. For example, the idea of a VR configurator for customer guidance was widely explored. Finally, three demonstrations were also developed, in the form of virtual or augmented reality apps, that illustrate the technologies (e.g. visualising different types of radiators in a room).

The pilot project will continue in 2021. Building contractors who are interested can still register.

Optimising data exchange quality between construction project partners

> With BIM4SUB we want to improve the cooperation between the partners involved in a project.



The BIM4SUB research project, funded by the Walloon Region, aims to facilitate access to data from a digital 3D BIM model. What is it all about? Improving cooperation between the main contractor and the subcontractors involved in the same construction project, by optimising the data exchange process. This transfer of digital data has a number of weaknesses, including repeatedly coding the same information into the system at different project phases, with an attendant increased risk of errors, loss of time and thus reduced productivity.

The project, completed in 2020, delivered two important results:

- the implementation in the BIM model of automatic control rules that guarantee the reliability of the modelled elements. Automation also saves time in the checking process, and ensures that errors are avoided as much as possible
- experimenting with a web interface linked to the data coming from a BIM model that allows any user (including subcontractors) to access the real-time updated data immediately, easily and securely, without itself having to use modelling software.

Stimulating the application of digital technologies by construction companies

The corona crisis has made clear the urgency of digitising the construction sector. This process can only enhance contractor competitiveness. The construction trades must therefore adapt to the new digital technologies. In this context, the BBRI, in collaboration with technological and sectoral partners, launched in early 2019 the projects 'BUILD4WAL' (with the financial support of the Walloon government) and 'Democentrum Bouw 4.0' (co-financed by Flanders and the European Union). Both projects aim to stimulate the adoption of digital technologies by construction companies.

Thanks to the mobile demonstration hubs, which were ready in 2020, we can meet SMEs on their construction sites to demonstrate the added value of 4.0 technologies. To this end, the needs of contractors in each construction trade are being mapped via the BBRI Technical Committees. In this way each construction trade gets the opportunity to discover, on the basis of concrete and specific scenarios, the applications that can help in its work.

In addition to the mobile hubs, demonstration buildings will also be erected at our Limelette and Zaventem sites where professionals can familiarise themselves with almost all 4.0 technologies applicable in construction. Work is already underway in Zaventem, and is scheduled to start in Limelette during the second quarter of 2021.

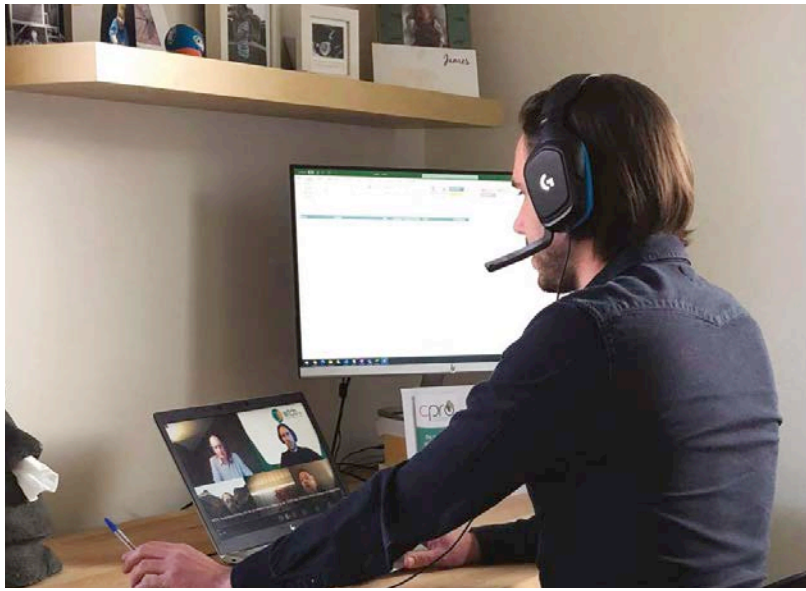
> Every construction trade will have the opportunity to discover the digital applications that can help in its work.

‘BouwRadar’

700 SMEs from the construction sector have received a full screening of their business operations over the past four years. With the support of the Flemish government, the *Confederatie Bouw*, Deloitte, FIBS, the Flemish Agency for Innovation & Entrepreneurship and the BBRI provided free-of-charge, customised audits thanks to the ‘BouwRadar’ (Building Radar) service (closed in 2020).

During this review, attention was paid to strategy, personnel and cost calculation, finance and legal aspects. Based on all these themes, a report was drawn up, including a Kiviat diagram showing the position of the companies in relation to their competitors. From that report, a domain was chosen in which the construction company in question received specialised guidance on a one-off basis.

BBRI’s Management and Quality department provided a total of 160 advice/guidance sessions on cost price calculation. In 2020, a large number of companies received guidance in this area, which became even more relevant due to the corona crisis. During the half-day guidance session, a BBRI expert/adviser reviewed the company’s annual results, starting with a helicopter view, and then zooming in to project level. Primary focus: what is the actual cost of a project for the company in question? With this knowledge, companies are able to draw up more accurate quotations and can better determine which projects to focus on. In the current difficult economic situation, this is absolutely no superfluous luxury.



> What is the real cost price of a project?

Working more efficiently with Lean Construction

In 2020 the BBRI published its monograph 'Lean Construction – What changes in the business organisation?', intended for all construction companies and more specifically for company managers, quality managers, department heads and worksite managers. The work organisation method proposed by the lean construction model aims to improve the overall performance of a building project (both on the construction site and within the company itself), optimising its efficiency through a continuous, global and sustainable approach.

The publication first takes stock of the current productivity situation in the construction sector, after which it examines the concept of Lean Construction, both the management philosophy and the various collaborative management tools necessary for its day-to-day implementation in companies.

This philosophy is based on active and transparent collaboration between the different stakeholders and on the empowerment and involvement of the teams in the company's activities. It also rests on strong leadership from the hierarchy. The aim of this publication is to enable the sector to draw inspiration from this lean model and gradually adopt it to reorganise the work of the teams step by step.

> Lean Construction is a project management model that helps improve the productivity of construction sites.

Excel tool to calculate hourly rates

Offering self-employed persons a handy tool to calculate all the important financial figures for their businesses and at the same time showing them what self-employment really means: these are the two objectives of the BBRI's Excel tool for one-man businesses, which was finalised in 2020.

Different amounts are calculated from basic data that every self-employed person can easily request from his accountant. The most important calculations: the hourly rate to be charged and the cost indicator. Both are calculated based on the manager's net monthly salary and the number of days worked per year. With those figures at hand, it is easier to draw up correct quotations.

In the course of the year, self-employed persons can also check on a monthly basis whether they are on schedule. For this a tab has been added to the tool, which makes it possible to monitor the actual number of hours invoiced and the purchase of materials.

The tool is available to all members via the BBRI website. In case of problems in determining the data, a BBRI expert is always available via gebe@bbri.be or 02 716 42 11.

Source : Shutterstock

> This new tool makes it easier to draw up correct quotations.

Building materials and systems

‘DeepCrete’: fast, reliable checking of concrete for diaphragm walls

The ‘DeepCrete’ project, started in 2018 at the request of trade federations and deep foundation contractors (grouped in ABEF), focuses on the quality of concrete used in the construction of diaphragm walls, for which a lifespan of 100 years is usually specified. The quality of this concrete depends on a number of parameters (such as the care with which the excavation work is carried out or the placing of the reinforcement cage) but above all on the use of suitable concrete recipes and reliable control of fresh concrete prior to pouring.

After a first phase devoted to studying the correlation between the test methods for bleeding under pressure, we embarked on an extensive campaign of lab and in situ trials in order to identify a fast approach for the control of fresh concrete and also shed light on the influence of certain concrete composition parameters.

The tests continued in 2020, in collaboration with the main players in the sector. These will allow us shortly to update the recommendation sheet published in 2017, in consultation with the Construction Confederation and the various federations. This updated sheet will be a useful addition to the standards related to concrete (NBN EN 206 and NBN B 15-001), which make no reference to scientifically substantiated test methods or acceptability criteria for validating the specific properties of fresh concrete for diaphragm walls.

> The updated sheet will be a useful addition to the standards on concrete.

TIN 272: the reference for wooden floor coverings

TIN 218 for wooden floor coverings dated back to the 2000s. Given developments in the field of products and installation techniques, parquet layers told us this document was now out-of-date. For this reason, TIN 272 was published in May 2020, focusing on the application of wooden floor coverings and finishes. This document supplements TIN 269, which mainly describes the materials and required performance criteria.

This new Note is the result of close collaboration between two working groups, manufacturers and the Technical Committees 'Joinery'.

A key innovation is the definition of the tolerances, facilitating the assessment of the quality of the work. The Note covers both the tolerances that are checked immediately after execution and those that are permissible as a result of the normal movements of wood.

The recommendations for wooden floor coverings installed above underfloor heating have also been completely revised, with an entire chapter devoted to this subject. From now on, parquet layers know how to meet the wishes of their customers, as there is a high demand for this type of product, especially for wide planks. Based on the tests we have carried out, we can offer solutions for planks with a width-to-thickness ratio of 10 or more and also offer the construction professionals the necessary guarantees.

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This Note is the result of close collaboration with parquet layers, manufacturers and the Technical Committees 'Joinery'.

The Standards Antenna 'Finishing': at the heart of the construction sector

The purpose of the Standards Antenna (SA) 'Finishing' is to inform the sector about the developments introduced by the European standardisation of materials used for finishing walls and floors. It also provides technical assistance in the application of these standards. The materials, products and systems dealt with relate to almost 60,000 companies and almost all construction trades.

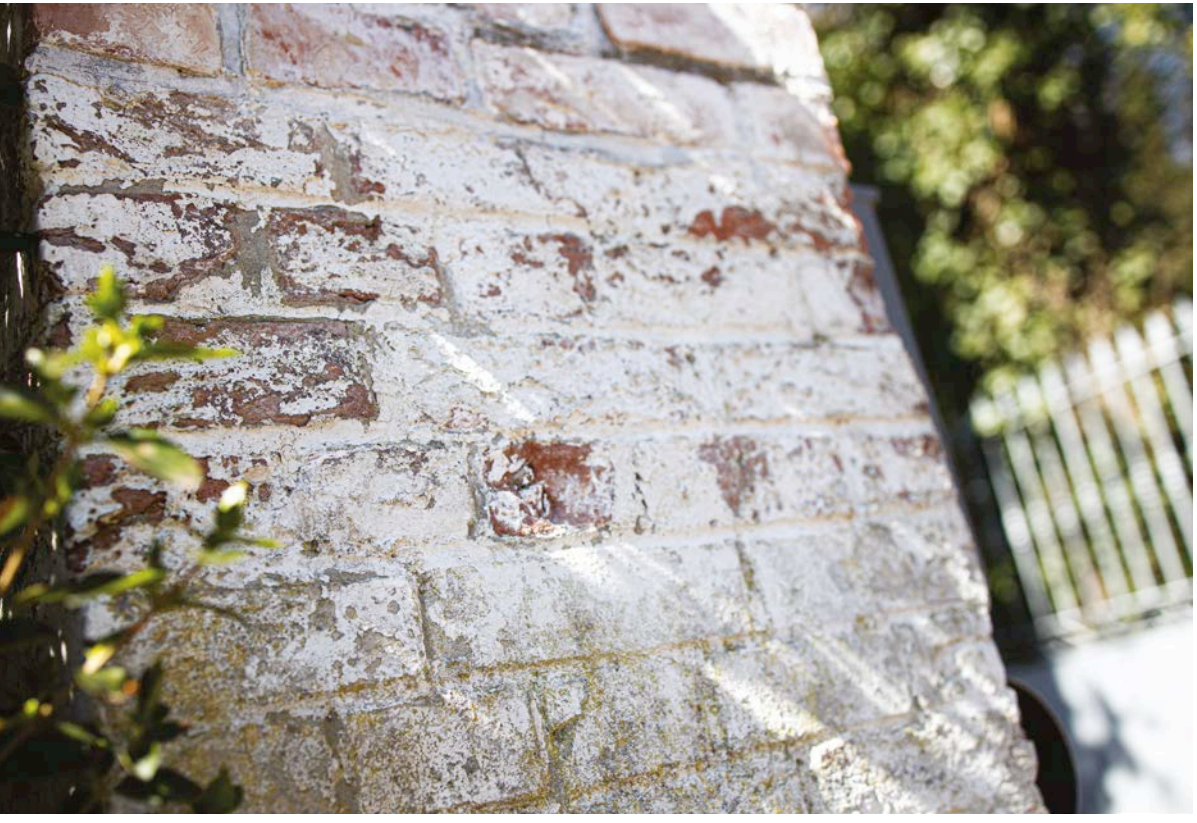
The SA 'Finishing' includes more than 100 standards. In 2020, in order to answer all the questions emanating from the Technical Committees or from the contacts between experts, members and manufacturers, we wrote 23 articles, held some 38 training sessions and online presentations and formulated direct answers for more than two hundred companies on various subjects (interior and exterior plastering, façade cladding, parquet, paints and varnishes, ceilings and light walls, hard floor and wall coverings and natural stone).

The training sessions aroused considerable interest and also opened the door to new questions. We have therefore identified a number of these that we would like to use to add new sheets to the FAQ section on the Standards Antenna website.

In 2020, we were also able to closely monitor the expected developments in standards at European level, enabling us to anticipate problems potentially arising for companies in the sector from possible changes in standardisation.

> The materials, products and systems covered by the SA 'Finishing' relate to almost 60,000 companies.

Understanding the behaviour of painted masonry



Following numerous cases of paint peeling on exterior brickwork, we started a research project on this subject in 2020.

The project aims to improve the compatibility of bricks and paints to find answers in ongoing disputes. In a more global way, with this project we also try to gain a better insight into the influence of paint on the behaviour of masonry. The fact is that the combination of brick with paint is never taken into account by manufacturers. The more specific cases of post-insulation and inside insulation, about which many uncertainties remain, will also be studied.

Five BBRI laboratories are deployed in this research programme, bringing an aggregation of expertise that provides a considerable added value to the project. This includes a characterisation of different materials (paints and bricks), of their combinations, and modelling of the hygrothermal behaviour of masonry. The aim of this approach is to estimate more quickly the behavioural changes under the influence of the various climatic conditions that may occur, and to assess whether there are risks of damage (for example an increased risk of condensation inside the brick, which could cause the paint to peel off).

We hope to be able to announce the first results and recommendations very soon.

> Five BBRI labs are working together to better understand the behaviour of painted masonry.

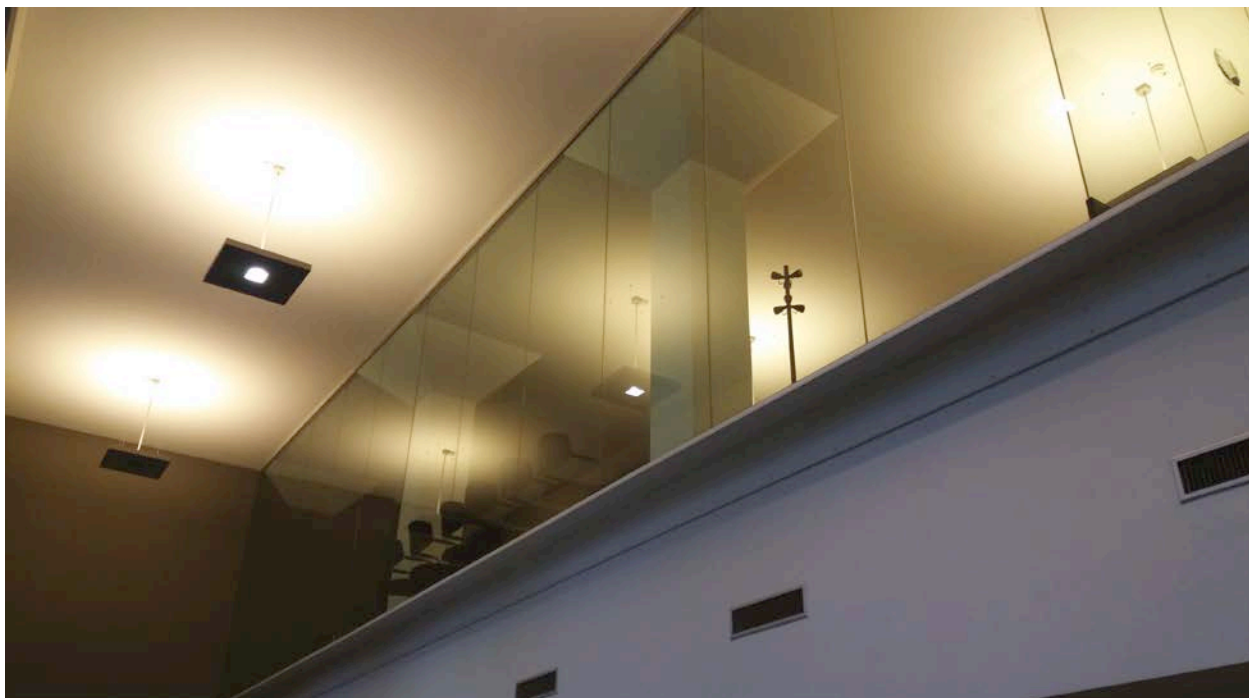
Correct dimensioning of internal glass walls guarantees people safety

In 2018, the Technical Committee 'Glazing' expressed the wish for a Note specifically dedicated to internal glass walls. The Technical Information Note 275, published in early 2021, supplements TINs 242 and 261, which relate to special glass elements in structural and non-structural situations respectively (display windows, hardened glass doors and units).

Although a European Assessment Document (EAD) exists for internal partitions, companies in the sector were of the opinion that this document does not provide the necessary guarantees for the safety of persons in the vicinity of internal glass walls. That is why in 2020 we focused on drawing up dimensioning rules, and especially precalculated tables, which allow construction professionals to choose the type of glass according to the different situations. These tables are accompanied by implementation guidelines, which form the basis of the Note.

For this, we carried out numerous tests, in particular in the workshops of a BBRI member contractor. These in situ trials enabled us to assess the relevance of the theoretical studies.

> The predimensioning tables for internal glass walls represent a real added value for companies in the sector.



Hemp lime in the construction industry

Hemp lime as an insulation material is gaining popularity in the Belgian construction sector. Its high thermal inertia and insulating and moisture-regulating properties make it interesting as a filling for wood structures or as internal or external insulation for existing walls. As a natural product obtained by mixing the woody part of the hemp stem with lime, water and additives, it also has great ecological potential.

But how can hemp lime best fit into building reality? To promote the practical use of hemp lime in the construction sector, a TETRA research project was started in 2019 with the support of VLAIO (Flanders Innovation and Entrepreneurship), together with the University of Hasselt and Pixii. The research results in 2020 were two practical handbooks with design and implementation guidelines and case studies, as well as three webinars and ten details developed for frequently occurring construction nodes. These contain, among other things, the results of the laboratory and in situ tests that BBRI conducted during the project.

On the basis of this information, contractors can set to work with hemp lime without unpleasant surprises later on. They can also better inform their customers about the expected hygrothermal performance.

> Hemp-lime-based materials are a real alternative to traditional solutions.

Better information for the sector on recurring pathologies

Based on its experience and the various pathologies that have come to light during site visits, the 'Technical Advice' department has this year drawn up new Pathology Info Sheets (*Infofiches*). These seek to inform all construction professionals about various recurring problems in a highly practical way.

The very concise sheets give the context and describe the problem, explain the causes of the damage and point to repair and prevention measures to be considered. Of course they cover all building trades in the different fields (structural work, finishing, special techniques etc.).

Themes published in 2020 include, for example:
- degradation of a liquid roof waterproofing
- backflow of wastewater in a shower
- cracking in façade masonry due to thermal movements
- damage to the fixed bottom rail of a sash in meranti
- loosening of floor tiles on an anhydrite screed.

These Info Sheets also contain links to various related standards and BBRI publications.

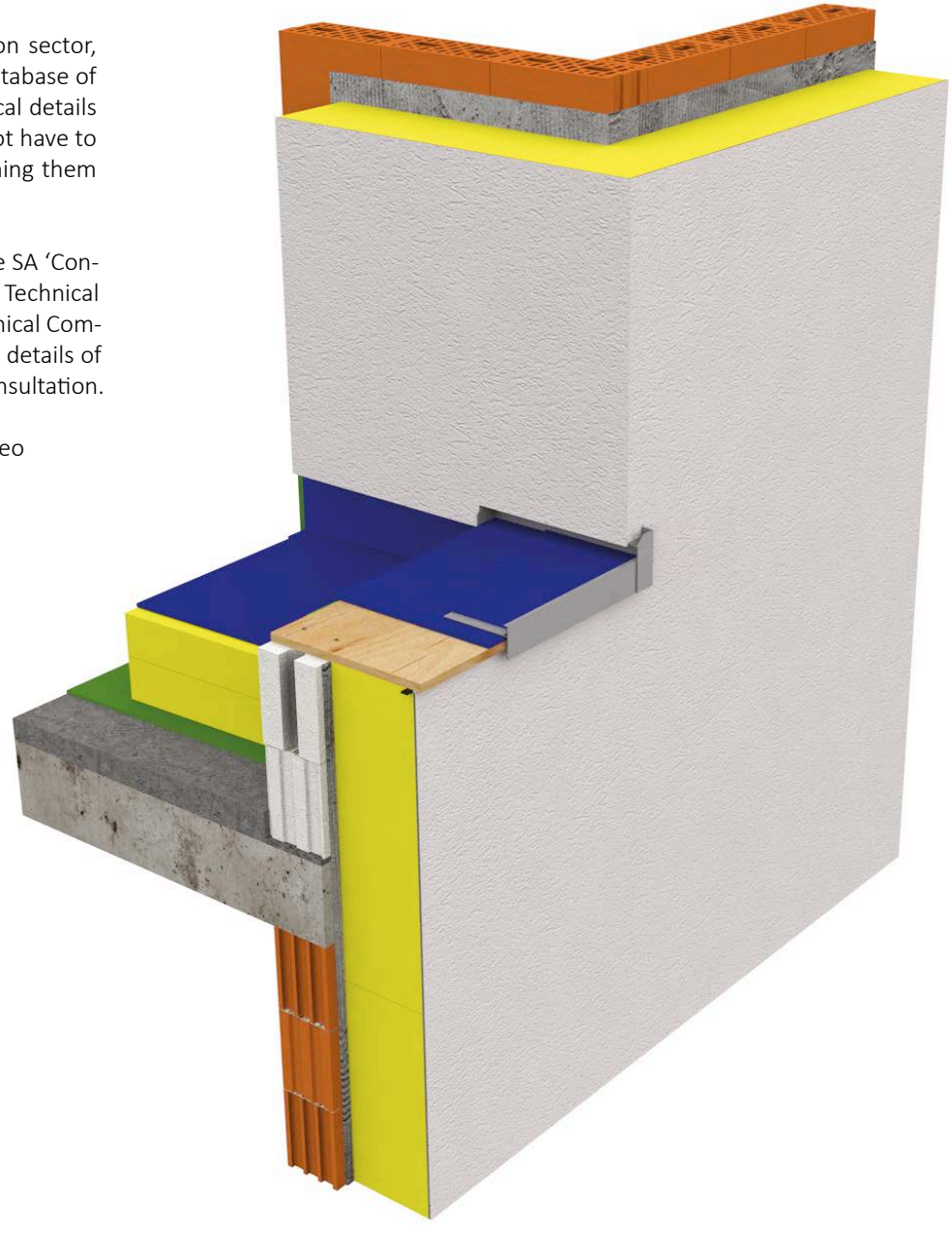
> The Info Sheets (*Infofiches*) are inspired by the problems we encounter on construction sites and offer a practical and complete tool for all contractors.

Standards Antenna 'Construction Details' (Smart Connect)

Standards Antennas (SAs) exist in various domains, including the construction sector, and are financially supported by the FPS Economy. The construction details database of the SA 'Construction details' (Smart Connect) makes it easy to consult technical details online, for example on a construction site. Moreover, a working group does not have to wait until all details have been finalised and bundled together before publishing them in the database. As soon as a detail is completed, it is quickly placed online.

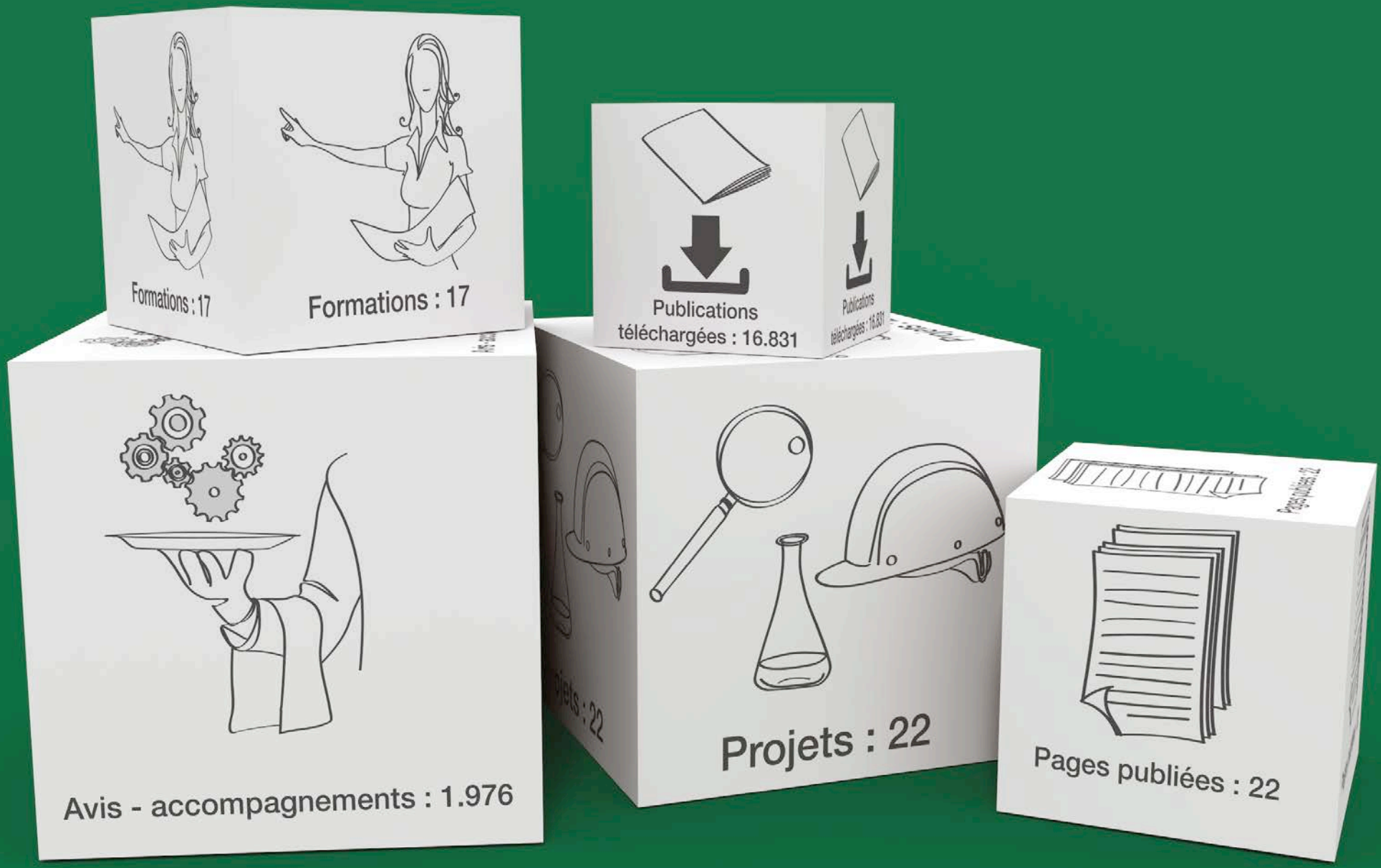
For these reasons, the ETICS Reference Details working group made use of the SA 'Construction details' last year. In this way, the group, consisting of members of the Technical Committee 'Rough Structure and General Contractors' together with the Technical Committee 'Plastering, Jointing and Façade Work', was able to make all completed details of works carried out with ETICS (exterior wall insulation) rapidly available for consultation.

In 2020, six sheets with practical points of interest plus clarifying photo and video material were placed online. These were also bundled in Technical Information Note 274, which contains links to this database. New data sheets will be systematically made available in the future. The information can also be easily adapted and supplemented.



> Thanks to the database, new technical details can be quickly posted online.

Energy


Formations : 17
Formations : 17
Publications téléchargées : 16.831
Avis - accompagnements : 1.976
Projets : 22
Pages publiées : 22

‘Brugeo’ brings shallow geothermal energy a step closer in Brussels

Today, geothermal energy is not yet frequently used as a technology for renewable energy. The ‘Brugeo’ project aims to promote it in the Brussels-Capital Region, in particular the use of shallow geothermal energy in combination with heat pumps for heating and cooling buildings. To this end, the geothermal potential of our capital was accurately mapped, in close collaboration with the Belgian Geological Service. During test drillings, the BBRI installed the sensor cables required to measure the temperature and thermal conductivity of the subsoil.

To make the project results widely accessible, they were incorporated into the online tool ‘Brugeo’ (available at environnement.brussels). This demanded regular consultation with Brussels Environment. The BBRI contributed to the project on the basis of the experience gained with the ‘Smart Geotherm’ tool, the result of a similar mapping previously carried out in Flanders. We also ensured smooth interaction between the new ‘Brugeo’ tool and the existing ‘Smart Geotherm’ tool.

Using this new tool, one can learn in just a few clicks the subsoil structure in a certain location, the properties of the component layers, and what legislative requirements or restrictions apply. Furthermore, the user can quickly evaluate the feasibility of a geothermal project. For the BBRI, this project meant a fruitful collaboration, with a practical tool as a result.

> The online ‘Brugeo’ tool will give a boost to the application of shallow geothermal energy in Brussels.

Energy-storing windows

The ‘Clearpower’ research project, launched in 2020 in collaboration with UCL and co-funded by the EU and Wallonia, aims to develop electrochemical energy conversion systems. This technology is of great importance to the construction industry. The integration of nanostructured lithium-ion batteries into glazing will permit energy storage – a fundamental issue in the development of renewable energy sources – and contribute to the energy efficiency of buildings by means of ‘intelligent’ windows.

The technology already exists, but has to be adapted to the window frame, to which an ‘energy component’ is added, while retaining its functionality. In 2020 we started work on developing a prototype window frame by determining how and where we can best integrate these batteries. This is a real challenge as the lithium has to be encapsulated to avoid reaction with water and to maintain the sealing properties of the frame. Once completed, this prototype will be integrated into a building and monitored for several months to demonstrate the technical feasibility of the system.

Although still almost unknown to construction companies, this technology will enable the sector to make a technological leap forward. With their energy storage capability, these ‘smart’ windows offer new functionalities and contribute to the overall energy saving of buildings.

> Incorporating lithium-ion batteries in glazing will enable the construction sector to contribute even more to the green transition.

Better controlling inside insulation of existing walls

To be climate neutral by 2050, a target set by the EU, it is crucial to insulate existing buildings on a large scale. Insulation is usually done from the outside or through the cavity, but sometimes neither of these two options is possible. In this case, insulation along the inside offers a solution.

This technique is difficult to carry out. Despite its great potential, there is insufficient information about it in the literature, and professionals still lack the necessary tools to determine which product or system to apply and how best to proceed.

To compensate for this deficiency, the BBRI is taking part in 'IN2EuroBuild', a European research project that aims to draw up clear and practical guidelines for inside insulation. For this we are collaborating with German institutes that possess extensive expertise in this field. Thanks to the work undertaken in 2020, we have made significant progress, which will soon lead to simplified guidelines adapted to the needs of contractors.

In the meantime, we wanted to provide construction professionals with didactic tools giving them a very concrete insight into the basic principles of interior insulation (risks, application criteria, implementation details, etc.). In 2020, we therefore produced various videos that are available via the BBRI YouTube channel.

“

Establishing clear guidelines adapted to the needs of contractors in the area of internal insulation.

Making the building heritage energy-efficient

How can we reconcile the requirements for the energy renovation of the building stock and respect for the building heritage? To answer this question, the 'P-Renewal' project was launched at the request of the Walloon public authorities. The aim of the project, being carried out in collaboration with UCL, is to design a methodological tool for energy renovation adapted to old Walloon buildings, in particular residential buildings built before 1914.

After an initial phase of technical analyses based on real in situ cases, we focused in 2020 on synthesising the results and drafting renovation strategies (architectural, material and technical) in the form of practical tools that can be used directly by those involved in the field. With this we respond to a request from renovation professionals who are keen to preserve the buildings heritage. They are well aware of these buildings' added value (social, cultural and economic), but at the same time regret a lack of training on the specificities of such buildings.

In order to connect as closely as possible to the daily reality in the field, this tool is being developed in close collaboration with users, after which it will be made available to everyone via a web interface.

The results of the ongoing research into techniques that combine energy efficiency and respect for the building heritage will soon be the subject of seminars and training. In the longer term, we hope that the tools developed under 'P-Renewal' will lead to new skills that can be applied throughout the territory.

> A methodological tool for energy renovation adapted to old buildings and directly usable by construction professionals.

‘Prio-Climat’: innovative ventilation systems better adapted to renovation

Although ventilation is not only essential for air quality, but also indispensable for our comfort and health, it is often overlooked in renovation work: a ventilation system is not always easy to install and involves costs that are not considered as priority. The aim of the ‘Prio-Climat’ project is therefore to devise innovative and efficient ventilation systems that are easier to install, less expensive and consume little energy.

Two new systems with convincing results were first studied and optimised using numerical simulations, before being tested in real life in two Brussels social housing units. One supplies the house with fresh air and mechanically removes the polluted air; the other uses natural supply and mechanical removal. In 2020, the BBRI worked on the design, implementation and eventual adaptation of these systems on site.

To ensure that these new forms of ventilation are readily accepted, ‘Prio-Climat’ provides for a detailed evaluation of both the technical and the more ‘sociological’ aspects, based on interviews with residents and questionnaires. The ultimate goal is to develop a matrix of the various high-efficiency ventilation concepts available for different renovation situations, allowing all professionals involved in this type of work to choose the most appropriate system.

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‘Prio-Climat’ wants to make ventilation systems in renovation projects affordable, efficient and comfortable.

BBRI'S ASSOCIATIONS

The BBRI participates in the work of various associations related to construction and has even contributed in the establishment of some of them. Dedicated to a wide range of activities within the sector, these institutions aim to support companies as their continuous priority.

Tradecowall
Tradecowall (www.tradecowall.be) looks for solutions for the processing of inert waste and excavation soil from construction and demolition sites. The certification and traceability of soil movements in Wallonia came into effect in May 2020. A big step forward for the construction industry!

Belgian Construction Quality Society (BCQS)
BCQS (www.bcqs.be) trains and advises building professionals involved in a labelling and/or certification process (e.g. quality management (ISO 9001), safety management (VCA and ISO 45001) and environmental management (ISO 14001)). BCQS also organises training courses on sustainable building management. As a privileged partner of BCCA and Construction Quality, it supports companies that have signed up for the quality programmes set up by these two associations.

Belgian Construction Certification Association (BCCA)
BCCA (www.bcca.be) is one of the leading Belgian certification bodies in the construction sector and has, thanks to this status, an accreditation from the BELAC office. This non-profit making association is a leading operator for ATG and BENOR certification, and carries out activities in the context of the CE marking of construction products.

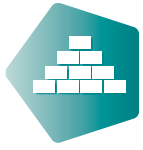
Belgian Centre for Domotics and Immotics (BCDI)
BCDI (www.bcdi.be) describes itself as a study and information centre on home domotics and immotics. Themes such as energy management, intelligent maintenance, facility management, safety and security in smart buildings and smart districts belong to the BCDI's field of action. In recent decades, the centre has collaborated on various national and European research projects, as well as on conferences, forums and workshops.

Organisatie voor Duurzame Energie (ODE Vlaanderen)
As a coordination body for sustainable energy in Flanders for more than 20 years, ODE (www.ode.be) brings together more than two hundred companies, knowledge centres, universities and organisations to exchange experience. It also ensures the dialogue between companies and organisations from the renewable energy sector and the public authorities through thematic platforms on: heat pumps, photovoltaics, biomass, wind energy, heat networks, etc. Within this context, the BBRI is involved in the integration of renewable energy systems in buildings and the transition to climate-neutral solutions.

Vlaanderen Bouwt (Vlabo)
Vlabo vzw (www.vlaanderenbouwt.be) aims to build quality housing at affordable prices, with an architecture that forms an enrichment in less evident places (e.g. in towns and city centres). Furthermore, it also strives for optimal technical quality, sustainability and town-planning coherence. Landowners – both public authorities and individuals – can call upon Vlabo as a project manager.

The BBRI's activities are guided by fifteen Technical Committees. While eleven of the Committees directly represent a specific construction trade and are composed primarily of contractors, the others focus on subjects of interest to several trades. In order to guarantee this bottom-up approach, each Committee defines the actions that will be carried out in the following year, via work plans submitted to the Standing Committee of the BBRI for approval.

Rough Structure and General Contractors



Chairman: X. Braet
Members: K. Andries, J. Bosmans, L. Courard, G. De Schutter, P. De Vylder, J. Deceuster, F. Demeulemeester, R. Dhuyvetter, P. Dresse, T. Eeckhaut, B. Geentjens, E. Gelaes, P. Goetinck, J. Govaerts, P. ibens, S. Kaye, F. Lederer, J. Maertens, K. Neutens, P. Pirotton, M. Seculier, R. Van Acker, D. Van Campenhaut, E. Vandewiele, A. Vermeyen
Engineers-leaders: V. Dieryck, N. Huybrechts, B. Parmentier
Engineers TAC: M. Ghislain, A. Van der Auwera

Heating and Climate Control

Chairman: D. Peytier
Members: P.-Y. Badot, W. Beeck (since June), M. Blondiau, L. Brees, J. Caerels (since January), M. Decat (since January), L. Dedeyne, G. Diericx (until May), G. Diricq, G. Gronsfeld, E. Maertens, J. Mampaey, L. Mehaudens, W. Neuville (since January), C. Nonneman, J. Nouwynck, A. Palumbo, I. Piette (since January), F. Santucci, J.-P. Somers (since January), M. Therer, K. Vanlancker (since January), W. Vanmeert (since January), K. Van Campenhout, E. Vandenbosch, K. Wuyts (since January)
Engineers-leaders: C. Delmotte, P. Van den Bossche
Engineers TAC: I. De Pot, V. Jadinon

Paintwork, Flexible Wall and Floor Coverings

Chairman: S. Magnee
Members: G. Baert, P. Carlier, A. Cassauwers, C. Callandt (since September), F. Coveliers, T. De Jaegher, J. Debuf, O. Delvaux, B. Dethune, E. Fleurinck, L. Gailly (since August), A. Gulisano, R. Hermans, B. Klinkers, J.-P. Lempereur, J. Lerot (until May), J.-C. Leroy (until May), J.-L. Louis (†), A. Mertens, P. Noé, J. Philippart (until August), M. Piron (until May), I. Simonet (until September), M. Van Den Branden, D. Van Kerckhove, D. Vanden Driessche, L. Vanrenterghem, L. Verhelst, T. Vrambout
Engineers-leaders: E. Cailleux, E. Nguyen
Engineers TAC: K. Janssens, T. Rondou

Hard Wall and Floor Coverings

Chairman: P. Goegebeur
Members: T. Archambeau, R. Baugnies, V. Baumard, M. Bauters, T. Beernaert, H. Berth, A.-M. Bonnet, B. Broekaert, D. Crombez, G. De Smet, J. De Smet, P. De Stobbeleir, E. Godderis, T. Hemelsoet, S. Hens, P. Holderick, M. Keulen, V. Lefort, A. Mahaux, G. Mahaux, M.-M. Mennens, N. Naert, G. Pardon, G. Ponzo (since November), B. Roten, B. Royaux, C. Van De Velde, D. Van Kerckhove, E. Van Rumst, L. Vandewiele (since November)
Observers: C. Arnould, B. Vangeersdaele, T. Verstaen
Engineer-leader: T. Vangheel
Engineers TAC: L. Firket, J. Van den Bossche

Glazing

Chairman: A. Sanchez
Vice-chairman: J. Jacobs
Members: J.-P. Aubert, L. Bonnave, A. Cassauwers, D. Ceyssens, H. Ceyssens, G. De Landtsheer, L. Delvoie, D. Dequidt, J. Devilers, P. Dresselaers, V. Goethals, T. Hens, T. Laurens, G. Martens, M. Martinez, A. Minne, P. Mistler, R. Nokerman, W. Reniers, F. Symoens, F. Triekels, J. Verhaert, L. Verhaert
Engineer-leader: V. Detremmerie
Engineers TAC: F. Caluwaerts, R. Durvaux, L. Lassoie

Sealing Works

Chairman: R. Evens
Members: S. Baelen, F. Belin, D. Bellanger, H.-C. Boulanger, F. Coninx, J. Coumans, C. Coussens, K. Derde, M. Kersschot, P. Kerstenne, J. F. Labrouche (since June), F. Louwers, K. Mangelschots (since November), H. Michot, J. Moens, R. Naert, E. Schomus, S. Terryn, G. Timmermans (†), P. Van Acker, L. Van Audenhaege, G. Van Dyck, D. Van Genechten (since May), D. Van Kerckhove, P. Van Rysseghem (since May), M. Wagneur, K. Wienen
Engineers-leaders: E. Mahieu, E. Noirfalisse
Engineer TAC: D. De Bock

Roof Coverings

Chairman: C. Vandermosten
Members: U. Bal, F.-X. Bocage, A. Bountzouklis, F. Cauwelier, S. Couez, J.-F. Crohin, P. Crohin, S. Daelman, C. Degreef, S. Depuis, G. Derde, P. Donner, Y.-M. Dron, M. Dubois D'Enghien, J.-F. Fontenoy, B. Fournet, R. Geens, D. Gouverneur, J. Lemmens, M. Lesenfants, B. Rahier, C. Résimont, P. Segers, T. Stockman, C. Suarez, A. Thierens, G. Timmermans (†), J.-M. Tong, J. Van Leeuwen, N. Vander Putten, A. Vanhove, R. Vignix, D. Wattel, L. Zanussi
Engineers-leaders: F. Dobbels, D. Langendries
Engineers TAC: D. De Bock, L. Geerts

Sanitary and Industrial Plumbing, Gas Installations

Chairman: P. Deweer
Members: W. Beeck (since September), K. Beenaerts, J. Caerels (since January), V. Cazier (since January), B. Claessens, S. Creffier (since January), M. Decat, L. Dedeyne (since January), G. Diericx (until April), J.-P. Geerts, G. Gronsfeld, E. Maertens, J.-F. Minne, C. Nonneman, D. Peytier, F. Santucci (since January), Y Simar (since January), M. Spector (until January), K. Van Campenhout (since May), M. Van der Beken (until January), C. Van Dinter, P. Van Rompaey, K. Wuyts
Engineers-leaders: B. Bleys, V. Jadinon
Engineer TAC: I. De Pot

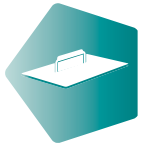
Joinery

Chairman: M. Collignon
Members: C. Allard, M. Charlot, F. Corbesier, B. Corman, M. D'Haene, F. De Frutos, E. Defays, C. Delvaux, O. Dumoulin, H. Frère, A.-W. Laurent, Y. Lemince, C. Liegeois, C. Louis, C. Macors, N. Maquet, L. Mohymont, R. Perard, C. Smetz, J.-M. Vandegaar
Engineers-leaders: S. Charron, B. Michaux
Engineer TAC: G. De Raed

Stone and Marble

Chairman: H. Vanderlinden
Members: A. Abraham (since March), J. Abraham, R. Baugnies, K. Callebaut, H. Callewier, G. Claerbout (since March), J. P. Cnudde, V. Cnudde, A. Demesmaeker (since March), P. Dethier, J. Elsen, M. Flament, P. Goegebeur, E. Latour, G. Legein, A. Matthys (until September), M.-M. Mennens, B. Misonne, C. Mordant (since March), P. Noé (since January), D. Pallix, S. Piedboeuf, S. Renier, T. Schotte (until March), F. Tourneur, G. Van Gucht, K. Vandenneucker, B. Wauters
Engineers-leaders: D. Nicaise, G. Van Den Bleeken (since March)
Engineers TAC: L. Firket, J. Van den Bossche

Plastering, Jointing and Façade Work



Chairman: D. Verhaegen
Members: P. Beaujean, J. Beke, B. Broekaert, P. Cherchye, O. Cremer, R. De Haes, P. De Kinder, J.-P. Demuynck, C. Denayer, M. Dutry, E. Godderis, J. Govaerts, H. Hendriks, J.-Y. Huberty, S. Jamar, G. Mostenne, N. Naert, M. Oldyck, J. Peeters, U. Peter, S. Piedboeuf, J. Schalley, H. Spoormakers (since August), P. Timperman (until February), D. Van Kerckhove, V. Verachten, G. Veys
Engineers-leaders: I. Dirkx, Y. Grégoire
Engineers TAC: S. Korte, M. Lignian

Building Physics, Comfort and Safety

Chairman: E. De Kempeneer
Vice-chairman: M. Ruebens
Engineers-leaders: L. De Geetere, X. Loncour, Y. Martin, J. Van der Veken
Engineers TAC: A. Acke, G. De Raed, S. Eeckhout, J. Goovaerts, M. Lignian

Hygrothermy

Chairman: /
Members: M. Bonnarens, A. Dawans, E. De Kempeneer, V. De Meulenaer, P. Deweer (representative of the TC 'Sanitary and Industrial Plumbing, Gas Installations'), V. Feldheim, M. Frederic, H. Geeraerts, A. Gillard, A. Janssens, K. Ludwik, J. Lavens (until March), J.-P. Minne, D. Peytier (representative of the TC 'Heating and Climate Control'), I. Piette, B. Present, S. Roels, M. Ruebens, N. Spies, V. Szpirer, A. Van Eycken, D. Van Kerckove, C. Van Loock, E. Van Overmeire, R. Van Rossem, J.-P. Wintgens
Engineers-leaders: X. Loncour, J. Van der Veken
Engineer TAC: A. Acke

Acoustics

Chairman: C. Decaesstecker
Members: S. Cassiman, J. Coose, R. De Block, C. Debonne (until October), E. Degrave (until July), E. De Kempeneer, P. Dresse, R. Dumont, H. Fabri, R. Geens, A. Gillard, F. Goes (until October), A. G. Graceffa (until April), C. Grimonpont, S. Hayen, B. Heymans, B. Justin (since July), J.-P. Lahaye, J. Lavens, J. Marinus, K. Maroy, A. Minne, H. Mostmans, J. Nemerlin, G. Oushoorn, P. Roman, M. Ruebens, P. Toussaint, M. Van Damme, H. Van Keymeulen, C. Van Loock, E. Van Overmeire, P. Vandewiele, M. Vanstraelen, L. Vasseur, G. Vermeir, J.-F. Winant
Engineer-leader: L. De Geetere
Engineers TAC: J. Goovaerts, M. Lignian

Fire safety

Chairman: M. Leysen
Members: B. Akkermans, M. Berckmoes, S. Cassiman, M. Colson, C. Decaesstecker, M. Delruelle (since November), V. Detemmerman, R. Goovaerts, B. Heymans, G. Janssen, E. Mackelbergh, J. Marinus, C. Pimpurniaux, M. Ruebens, B. Stockbroeckx (until November), W. Van de Voorde, T. Van Helden, K. Van Herpe, N. Van Houten, C. Van Loock, A. Van Steelant, K. Vercaempt, A. Verhoeven (since March), P. Verhoeven (since October), J.-P. Veriter
Engineers-leaders: S. Eeckhout, Y. Martin
Engineers TAC: G. De Raed, J. Goovaerts

Architects

Chairman: J. Beke
Vice-chairman: C. Bourgois
Members: J. Alboort (until October), A. Boutemadja, G. Colliers, Y. Craeye (since May), M. D'Anvers, B. Dangoisse (since May), D. De Clerck, R. De Lathouwer, S. De Nolf (since October), P. De Smet, L. Dedeyne, S. Demon (until May), E. Dufrasnes (since July), J.-C. Embrechts, E. Geens, E. Germijns, J. Glaude, T. Hermans, N. Huysmans, J. Jadoul (since November), J. Kessler (since November), H. Krokaert, T. Lamy, P. Laporta, C. Lemmens, F. Luyckx, J. Mariën, T. Modave, S. Motte, H. Poncin, M. Procès, T. Serck, E. Spitzer (since November), M. Vercruysse, D. Versluys, M. Wagneur
Engineers-leaders: S. Danschutter, P. Wouters

BIM & ICT

Chairman: M. Moens (since October), T. Vandenbergh (until October)
Members: P. Abeel, J. Alboort (until November), A. Argeles, M. Baetens (until November), K. Baggen (until November), J.-P. Bauwens, X. Bindels, A. Bitar, S. Boeykens, M. Bonnarens (since June), A. Boutemadja, W. Bouttery, M. Brochier, W. Bulens (until November), N. Calicchia, F. Campion (since November), R. Collard, J.-P. Couwenbergh, F. Crovato, C. Dalhuizen, J. De Cock (since November), S. De Nolf (since November), J. De Smedt, R. De Smedt (since November), B. De Smet (since November), B. De Spiegeleer (since November), V. Detemmerman, J. Dhondt (until November), A. Dubuisson, G. Duyckaerts (until November), D. Froyen, B. Geerinckx, T. Gretry, K. Grietens, R. Hageman (since April), D. Hellemans, P. Janssens (until November), G. Kerckhofs, R. Klein, K. Kozlowski (since June), J. Kuppens (until November), B. Lambert (since January), F. Lederer (since January), P. Legros, J. Lhoëst (until November), U. Linden, O Linder (since November), K. Luckx (until November), N. Maes, V. Marbach, V. Martin (until November), R. Meuleman, R.-H. Meurisse, M. Moens (until October), E. Moeyersons, P. Moutschen, F. Naeyaert (since November), J. Nolet, T. Nuttens, K. Nys, M. Oumzil, B. Pauwels (since November), P. Pauwels, G. Pierrard, E. Piers (until November), P.-B. Pousset, P. Present, A. Sagne, L. Schiltz, F. Schwall (until November), Y. Sottiaux (until November), N. Smets (since May), J.-M. Stiernon, W. Tanghe (until November), F. Van de Velde, M. Van Den Berg (since November), A. Van den Borre, J. Van Den Driessche, P. Van Den Eynde, S. Van Der Have, C. Van Loock (since November), J. Van Mol, H. van Oosterhout (since November), E. Van Overmeire, E. Van Overwaele, J. Vandamme, B. Vande Kerckhove (until November), K. Vandenbogaerde (since October), E. Vanmechelen, S. Verhaert, M. Verhiel, R. Voshol, T. Vyncke, A. Wouters
Engineers-leaders: N. Cauberg, M. Huerdo Fernandez (until November), G. Zarmati (since November)
Engineers TAC: R. Durvaux, S. Vercauteren

Smart & Sustainable Constructions

Chairman: R. Van Boeckel (until April), T. Vanderbergh (since October)
Members: K. Allacker, A. Argeles, P. Ballon, K. Beenaerts, J. Beneens, F. Blockx, M. Bonnarens, S. Breels, P. Callewaert, F. Cauwelier, T. Clerinx, M. Croufer, A. Dawans, X. De Bueger (until April), P. De Kinder, K. De Landsheere, G. De Landtsheer, G. De Schutter (until September), N. De Temmerman, J. Declercq, V. Detemmerman, K. Dupon, A. Fuhr, B. Gentens, G. Goossens, B. Huberlant, P.-H. Lefebvre, J. Lhoëst, S. Magnee, M.-M. Mennens, J. Michiels, J. Moens, S. Motte, V. Naessens, D. Peytier, L. Schiltz, W. Simoens, Y. Sottiaux, N. Stevens, M. Strobbe, F. Tourneur, S. Trachte (until November), L. Van de Loock, K. Van Dingenen, G. Van Gucht, L. Van Thienen, S. Vande Meulebroucke, S. Vanden Brande, A. Vanden Eynde, K. Vanderbruggen, J.-C. Vanderhaegen, R. Vereecken, D. Verhaegen, B. Vuyge
Engineers-leaders: R. Delvaeye, J. Vrijders
Engineers TAC: K. Janssens, S. Vercauteren

FINANCE

The accounts department aims to give a true picture of the financial situation of the Institute and to justify the management decisions made.

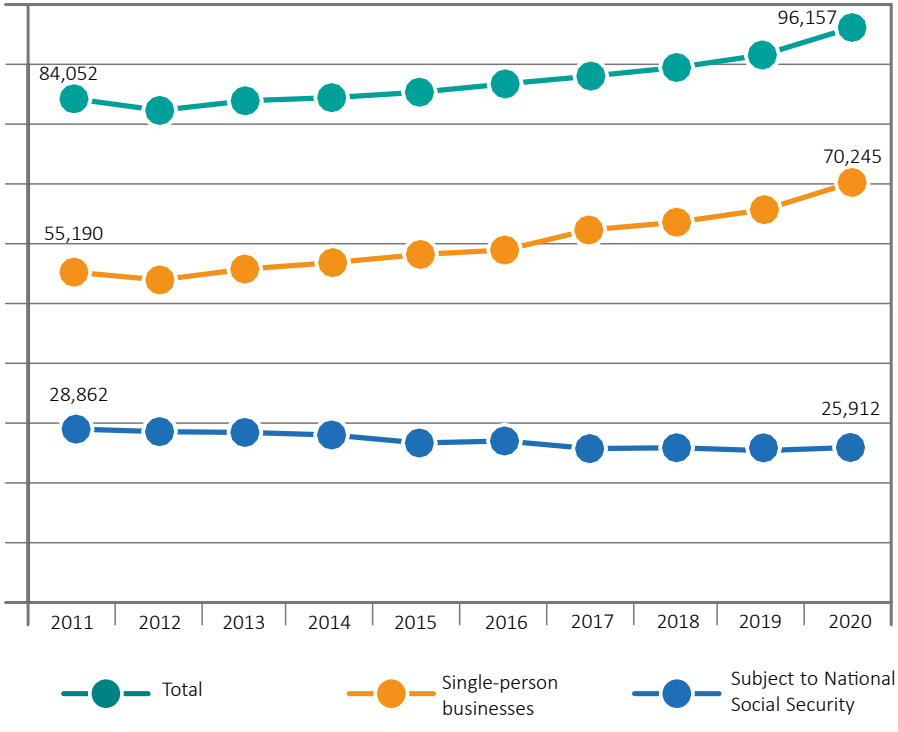
Affiliated members

On 31 December 2020, the BBRI had 96,157 members, including 70,245 single-person businesses. The graph below shows that this number has increased by 14.40% over the past 10 years.

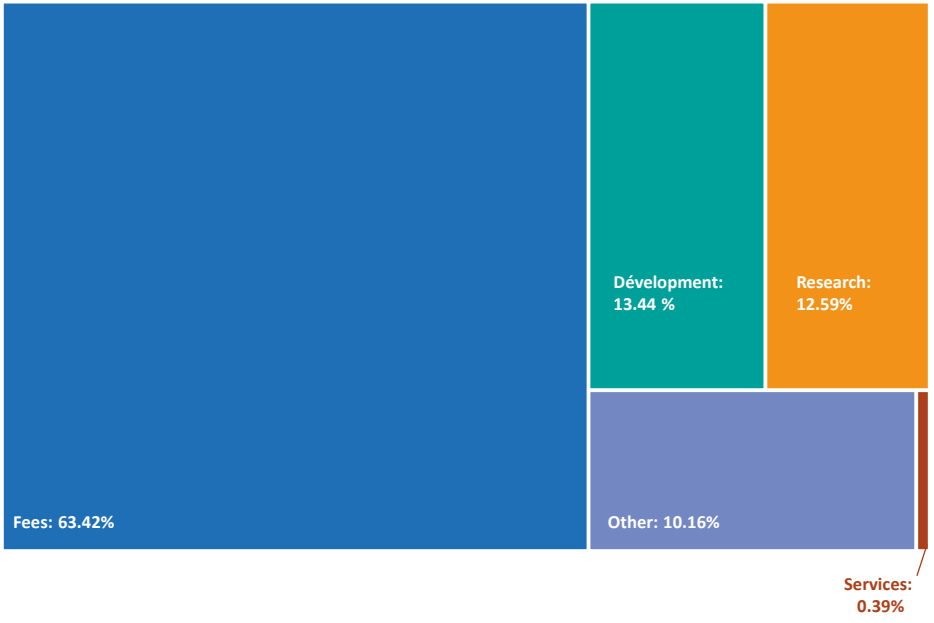
Operating revenues and expenditures

The graphs to the right illustrate the composition of the different revenues and expenditures in relation to the total. These show that members' fees represent around 63% of the total revenue. Personnel costs – the largest expenditure item – amount to 63% of the total outgoings.

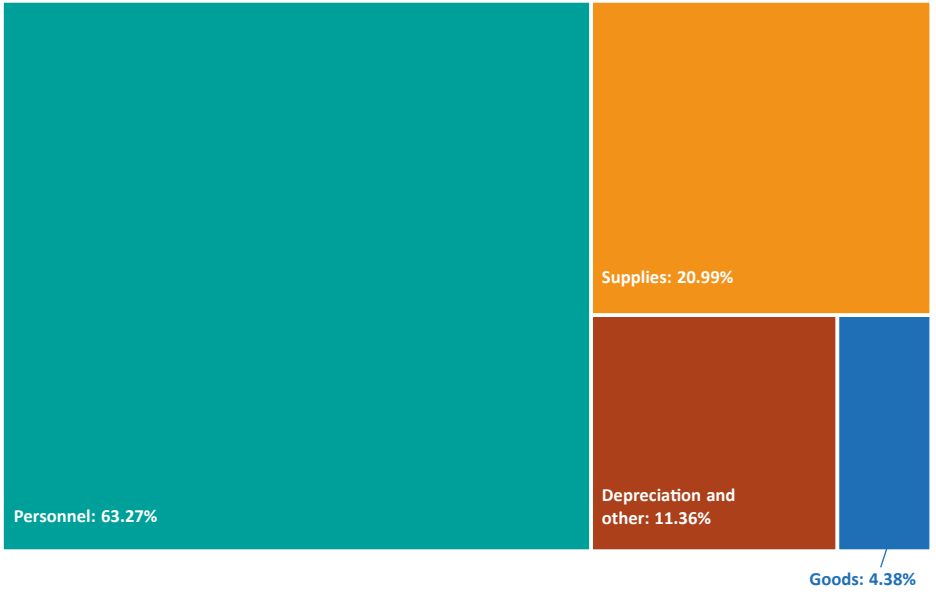
Evolution in the number of affiliates



Revenues



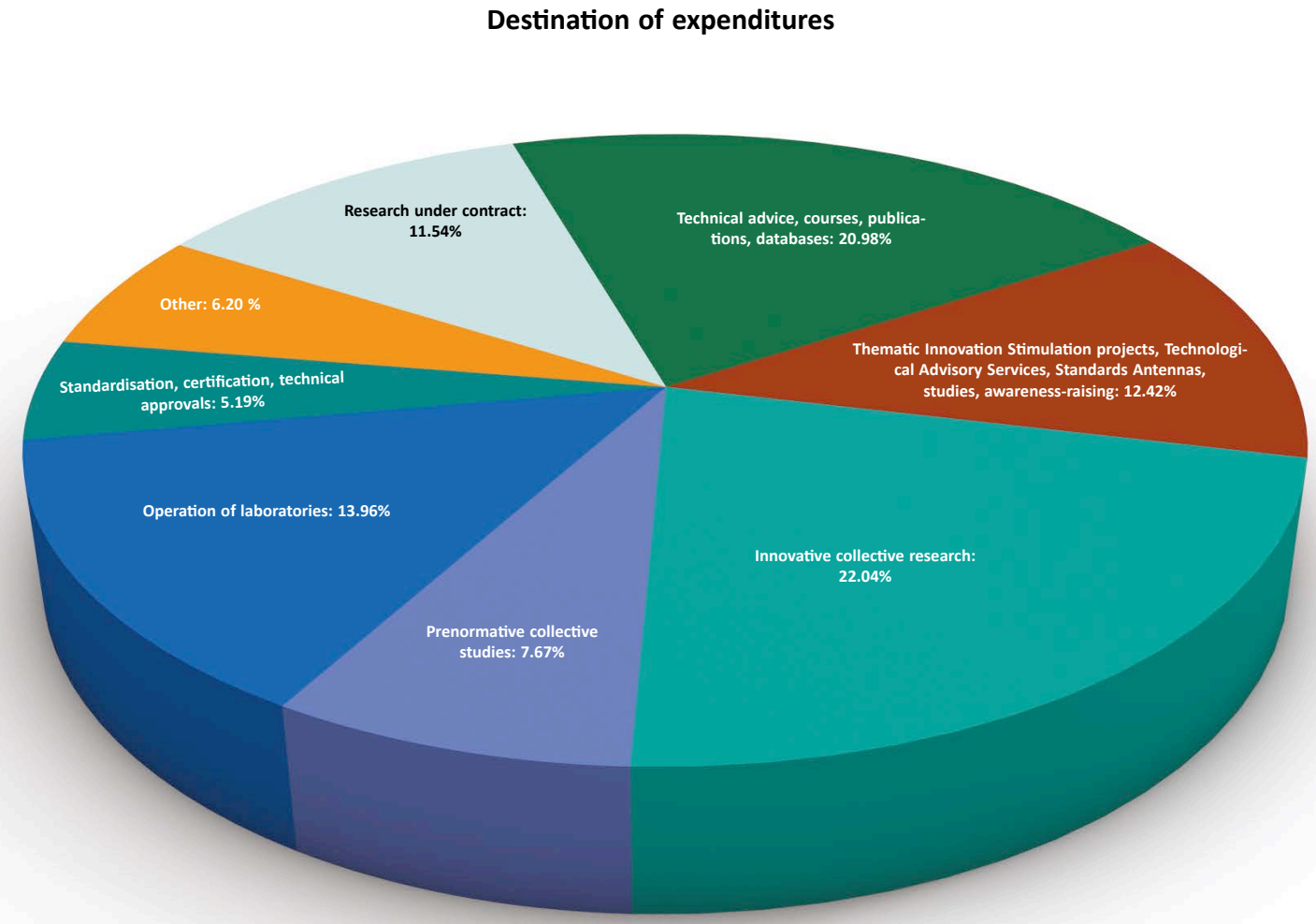
Expenses



Destination of expenditures

The pie below shows the destination of the expenditures that result from the BBRI's activities, after allocation of the structural costs. The latter represent not only the costs relating to the buildings and equipment, but also the administrative costs. This illustrates that all available resources are used, directly or indirectly, for the benefit of construction companies.

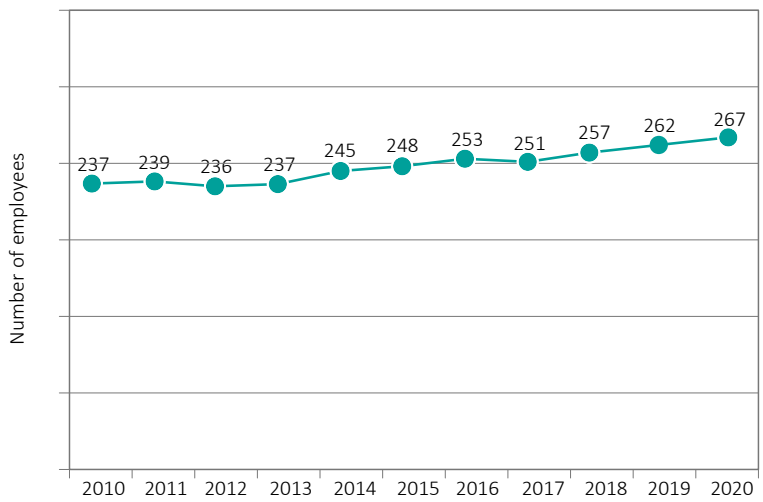
88% of the total budget is invested back directly into the sector, while 12% is spent on research activities under contract that, in the long run, also benefit construction. In other words, our entire income is spent on improving the quality and competitiveness of the sector, which is ultimately the primary objective of our institute.



STAFF

The BBRI can count on the expertise of motivated employees from various disciplines to successfully carry out its mission. This synergy of professional competence, commitment and versatility contributes to making the Institute the authoritative body it has become for the sector.

Evolution of the workforce during the period 2010-2020 (situation as at 31 December)



The BBRI makes great efforts to improve quality in construction and to strengthen the skills of professionals in the sector. This task is far from easy, given the fragmentation of the building process and the diversity of the partners involved.

To accomplish its mission and to anticipate technological evolutions, the BBRI relies on a dynamic and multidisciplinary team. Our personnel ensure that the fruits of scientific and technical research conducted by the Institute are used to benefit building contractors, as well as other professionals (architects, consultancy offices, chartered surveyors, education, administrations, etc.).

The experience and pragmatism of some staff members combined with the innovative vision of others make it possible to publish practical reference guides, provide customised technical advice, and also offer courses and training sessions corresponding to the actual needs of the industry.

Given these constantly increasing calls on the BBRI's services and its need to strengthen its impact, a further growth in personnel is foreseen in the coming years in order to realise the ambitions for 2025.

During the meetings of the General Council of the BBRI on 2 June 2020 and 24 November 2020, the composition of the General Council and the Standing Committee was approved as follows:

General Council

Chairman
J. Willemen

Vice-Chairmen
E. Devos, C. Golinvaux, T. Scorier

Honorary chairmen
J. Gheysens, R. Lenaers

Members appointed by the Confédération Construction
P. Crohin, R. de Mûelenaere, P. De Roover, J. Jr Devilers, R. Evens, B. Geentjens, B. Georges, F. Goes, A. Graceffa, R. Hinnens, S. Jamar, S. Kaye, E. Keijers, J. Lembrechts, E. Leskens, C. Maes, S. Magnée, G. Mahaux, O. Mareschal, L. Mohymont, J. Pérard, J. Polet, M. Ruebens, B. Schrevens, M. Schwanen, P. Segers, W. Simoens, W. Straetmans, B. Tasiaux, M. Therer, G. Van Gucht, H. Vanderlinden, E. Vandewiele,

Members coopted by the Confédération Construction
N. De Smet, E. Devos, C. Hautier, B. Heiderscheidt, D. Holemans, C. Peeters

Members appointed by the Bouwunie
G. Baert, J. Debuf, B. De Malsche, D. Hellemans, K. Kempeneers, P. Suys, L.-J. Vancauwenberghe, F. Verkest, J.-P. Waeytens

Member appointed by the FEB
C. Golinvaux

Members appointed by the Federal Public Service Economy
R. Collette, G. Jansens

Member appointed by the Walloon Region
A. Gillin

Member appointed by the Brussels-Capital Region
O. Eugene

Members appointed by the Flemish Region
S. Faignet, L. Van de Loock

Members appointed by the workers' organisations
P. Cuppens, G. De Vlaminck, J.-L. Teheux, J. Vandycke

Auditors
J. Lembrechts, B. Tasiaux

Statutory auditor
HLB Dodémont-Van Impe

Standing Committee

Chairman
J. Willemen

Vice-Chairmen
E. Devos, C. Golinvaux, T. Scorier

Members
R. Collette, R. de Mûelenaere, G. De Vlaminck, K. Kempeneers, J. Lembrechts, K. Neyrinck, L. Mohymont, M. Ruebens, E. Vandewiele, J.-P. Waeytens

Observers
A. Gillin, L. Van de Loock

LIST OF PROJECTS IN 2020

A-LIGHT II – Integrating lightweight concepts in acoustical standardization (FPS Economy and NBN)

ADEKIT II – *Développement d'un kit de détection d'amiante in situ dédié aux éléments inclus dans le bâtiment et l'industrie* (Development of a kit for rapid detection of asbestos on site for building and industrial components) (Greenwin - Wallonia)

ADERSOL – *Critères d'adhérence pour revêtements de sol* (Adhesion criteria for floor coverings) (FPS Economy and NBN)

AGGLOSTO – *Pierre agglomérée : vers un cadre normatif adapté pour l'utilisation de la pierre agglomérée dans le bâtiment* (Agglomerated stone: towards an adapted normative framework for the use of agglomerated stone in buildings) (FPS Economy and NBN)

AN Acoustique (SA Acoustics) (FPS Economy and NBN)

AN Béton-mortier-granulats (SA Concrete-mortar-aggregates) (FPS Economy and NBN)

AN Détails constructifs (Smart Connect) (SA Construction details) (FPS Economy and NBN)

AN Eau & Toitures (SA Water & Roofs) (FPS Economy and NBN)

AN Eclairage (SA Lighting) (FPS Economy and NBN)

AN Eléments de façades manuels et motorisés (SA Manual and motorized façade elements) (FPS Economy and NBN)

AN Energie et climat intérieur (SA Energy and indoor climate) (FPS Economy and NBN)

AN Eurocodes (SA Eurocodes) (FPS Economy and NBN)

AN Géotechnique (SA Geotechnics) (FPS Economy and NBN)

AN Parachèvement (SA Finishing) (FPS Economy and NBN)

AN Prévention du feu (SA Fire prevention) (FPS Economy and NBN)

AN Qualité de l'air intérieur (SA Indoor air quality) (FPS Economy and NBN)

AN Tolérances et aspect (Eye Precision) (SA Tolerances and appearance) (FPS Economy and NBN)

ATISOL C2C – *Système constructif comportant une membrane biosourcée pare-vapeur et d'étanchéité à l'air couplée à une isolation pour les bâtiments neufs à ossature en bois et pour la rénovation par l'intérieur, en suivant la démarche Cradle to Cradle* (Bio-based vapour barrier and airtight membrane construction system paired with insulation for new woodframe buildings and interior renovation, following the cradle-to-cradle method) (Greenwin - Wallonia)

AUTODRONE – *Geautomatiseerde inspectie van infrastructuur aan de hand van drones* (Automated inspection of infrastructures using drones) (VLAIO - Flanders)

B-LCA II – *Cadre méthodologique pour la réalisation de LCA dans la construction. Modélisation belge et ajustement du cadre européen* (Methodology framework for the execution of LCA in the construction sector. Belgian modelling and further development of the European framework) (FPS Economy and NBN)

BBSM – *Le bâti bruxellois : source de nouveaux matériaux* (Brussels' buildings: a source of new materials) (ERDF - Brussels)

BCCC – Brussels Construction Consolidation Centre (Innoviris - Brussels)

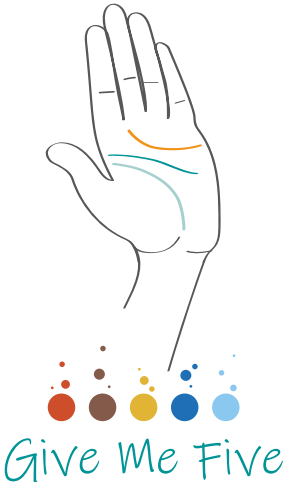
BE REEL! – Belgium Renovates for Energy Efficient Living (EU LIFE - European Union)

Betonherstel – *Nieuwe technologieën, producten en inzichten voor een duurzame herstelling van betonproducten* (Concrete Repair – New technologies, products and perspectives for sustainable repair of concrete products) (VLAIO - Flanders)

BIM MENUISERIES – *Outil intégré BIM-compatible sur les exigences des menuiseries extérieures et les performances des châssis en bois* (Integrated BIM compatible tool for the requirements of outdoor joinery and the performances of wooden frames) (BBRI)

BIMEXPO – *Réalisation d'un prototype (Poc) de la plateforme intelligente UX (User eXperience) qui combine les technologies BIM, VR (virtual reality) et HUB de données pour la salle d'exposition de Thomas & Piron* (Realisation of a prototype of the intelligent UX (User eXperience) platform which combines BIM, VR (virtual reality) and data HUB technologies for the Thomas & Piron showroom) (SPW EER - Wallonia)

BIMy – BIM in the city (Innoviris - Brussels)



BIO-CLAY-MASONRY – *Cadre normatif pour l'argile non cuite et les produits de maçonnerie biosourcés* (Normative framework for unbaked clay and bio-based masonry products) (FPS Economy and NBN)

Bouwhubs – *Logistiek in de bouw* (Logistics in construction) (VIL and VLAIO - Flanders)

BruGeo – *Valorisation du potentiel géothermique de la Région de Bruxelles-Capitale* (Exploiting the geothermal potential of the Brussels-Capital Region) (ERDF - Brussels)

BUILD4WAL – *Démonstrateur Construction 4.0* (Demonstrator Construction 4.0) (Digital Wallonia and DG06-Wallonia)

BuildCircular.brussels (Bruxelles Environnement)

C-Bridge – *Stappenplan naar ontwerp, regelgeving en constructie van composietbruggen in Vlaanderen* (Step-by-step plan for the design, regulation and construction of composite bridges in Flanders) (VLAIO - Flanders)

CBCI – Circular Bio-based Construction Industry (Interreg 2 Seas)

Centrum Bouw 4.0 (ERDF - Flanders)

Changing minds – *Op weg naar levenslang zorgeloos wonen. Het kruispunt tussen bouw en zorg* (Towards lifelong carefree dwellings. Where construction and people care meet) (VLAIO - Flanders)

Circulaire school van de toekomst (Circular school of the future) (Vlaanderen Circulair - Flanders)

Circular.Concrete – C^2 (SIM Flanders and VLAI0 - Flanders)

Clean.ETICS – *Guide pour le nettoyage des ETICS* (Guide for the cleaning of ETICS) (BBRI and BCCA)

Climate Change Resilience (BBRI)

CODEC II – Communication framework for digital construction (FPS Economy and NBN)

CoDyNi II – *Détermination in situ des performances énergétiques réelles des bâtiments à l'aide de tests de coheating dynamiques et de mesures non intrusives II* (On-site determination of the real energy performances of buildings using dynamic co-heating tests and non-intrusive measuring II) (FPS Economy and NBN)

COMISVENT – *Evaluation des performances des systèmes de VENTilation en phase de COnception et de MISe en service* (Evaluation of the performances of ventilation systems in the design and commissioning phase) (FPS Economy and NBN)

ConCure – *Mise au point d'une méthode et de critères robustes pour déterminer l'efficacité des produits de cure* (Development of a robust method and criteria to determine the efficiency of curing products) (FPS Economy and NBN)

Construire adaptable (Adaptable construction) (SPW - Wallonia)

CRAMIC – *Crane Dynamics* (SPW EER - Wallonia)

Création d'une application 'Spécification du béton' (Creation an application for concrete specification) (BBRI)

Création d'une application 'Diagnostic des bâtiments' (Creation of an application for building diagnosis) (BBRI)

CSiteVision – *Virtual en augmented reality in de voorbereidingsfase en uitvoeringsfase van gebouwen* (Virtual and augmented reality in the preparation phase and the execution phase of buildings) (VLAIO - Flanders)

C-Tech – *Guidance technologique Construction durable et Développement durable en Région de Bruxelles-Capitale* (Technological Advisory Service Sustainable construction and development in the Brussels-Capital Region) (Innoviris - Brussels)

Décollement de peinture appliquée sur maçonnerie de briques de terre cuite (Paint peeling on clay brick masonry) (BBRI)

DeepCrete – *Exécution de parois moulées : spécification du béton et contrôle de qualité* (Execution of cast walls: concrete specifications and quality control) (FPS Economy and NBN)

DigiPLACE – Digital Platform for Construction in Europe (H2020 - Europe)

DigitalDeConstruction - Advanced Digital Solutions Supporting Reuse and High-Quality Recycling of Building Materials (Interreg North-West Europe)

Digitale 3D-meettoepassingen voor een geïndustrialiseerd bouwproces bij nieuwbouw en renovatie (Digital 3D measurement applications for an industrialised construction process in new construction and renovation) (VLAIO - Flanders)

Doorgedreven implementatie van innovaties binnen ETICS met harde bekledingen (Extensive implementation of innovations for ETICS with hard coverings) (VLAIO-Flanders)

Drones in de bouw en landbouw (Drones in construction and agriculture) (VLAIO - Flanders)

Evacode II – *Méthode d'évaluation des performances des appareils de conditionnement d'eau destinés à prévenir la formation de tartre* (Evaluation method for the performance of water treatment devices designed to prevent limescale formation) (FPS Economy and NBN)

FCRBE – Facilitating the circulation of reclaimed building elements in NEW (Interreg North-West Europe)

FiSaF – Fire Safety of multi-story building façades (with combustible materials) (FPS Economy and NBN)

Garde-corps en verre : réévaluation (Glass railings: reassessment) (BBRI and BCCA)

LIST OF PROJECTS IN 2020

GeoCamb – Geothermal Energy potential in Cambrian rocks focusing on public buildings (Belspo BRAIN-BE)

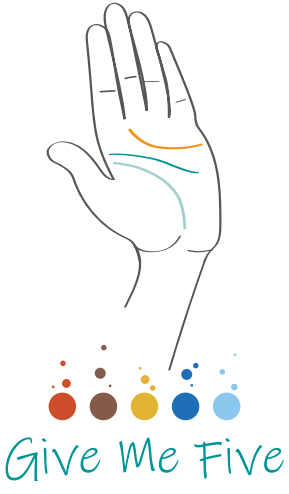
Gespecialiseerde energieconsulenten voor onroerend erfgoed (Specialised energy consultants for building heritage) (Agentschap Onroerend Erfgoed – Klimaatfonds)

GRANISEC – *Méthodologie pour l'évaluation de l'aptitude à l'emploi des granulats inertes secondaires dans le béton* (Methodology for evaluating the suitability of secondary inert aggregates for use in concrete) (FPS Economy and NBN)

GREEN ROOFS UP! – *Samen voor meer kwaliteitsvolle groene daken* (Together for more quality green roofs) (VLAI0 - Flanders)

HAMSTER – *Heat, Air and Moisture real scale Test facility for building elements* (ERDF and Innoviris - Brussels)

Hygrimpact II – *Impact des caractéristiques hygrothermiques des matériaux sur la performance thermique et le confort des bâtiments* (Impact of hygrothermal properties of materials on the thermal performance and the comfort of buildings) (FPS Economy and NBN)



Impact environnemental des revêtements de façade en bois et en panneaux à base de bois (Environmental impact of wood and wood-based panel façade cladding) (BBRI)

In-Vent-Out II – *Positionnement relatif des ouvertures d'amenée d'air par rapport aux évacuations d'air et de fumée des bâtiments* (Positioning of air supply openings in relation to the air and flue gas openings of buildings) (FPS Economy and NBN)

IN2EUROBUILD – Consistent European Guidelines for Internal Insulation of Building Stock and Heritage (Cornet - Wallonia and Europe)

Intégration d'un outil de calcul acoustique pour les systèmes de ventilation dans Optivent (Integration of an acoustic calculation tool for ventilation systems in Optivent) (BBRI)

Intellicht – *Intelligente lichtregelsystemen* (Intelligent lighting control systems) (VLAIO - Flanders)

KalkHennep_VL – *Ontwikkeling van ontwerp- en uitvoeringsondersteuning voor de toepassing van kalkhennep in de Vlaamse bouwsector* (Development of design and execution support for the application of hemp lime in the Flemish construction sector) (VLAIO - Flanders)

Kwalitatieve warmtenetten (Qualitative heat networks) (VLAIO - Flanders)

LARCOWALL – *Développement d'un hourdis-voile en béton extrudé, peu coûteux, utilisant des matériaux recyclés, tout en garantissant les performances d'inertie thermique et acoustique du béton* (Development of a low-cost extruded concrete hollow-core wall using recycled materials, while preserving the thermal and acoustic inertia of concrete) (SPW EER - Wallonia)

LifeMACS – *Multi-layer Bayesian life-cycle methodology for the structural assessment of existing concrete structures* (FWO - Flanders)

LLAB Retrofit – Living Labs Brussels Retrofit (ERDF and Innoviris - Brussels)

Modul'Air – *Modules de façade préfabriqués pour la rénovation accélérée de l'enveloppe et des systèmes de ventilation* (Prefabricated façade modules for a faster renovation of the building envelope and the ventilation systems) (ERDF and Innoviris - Brussels)

Monitoring van structuren en systemen met optische vezel (Monitoring of structures and systems with optical fibre) (VLAIO - Flanders)

NeoCem – *Aptitude spécifique à l'utilisation des nouveaux ciments belges* (Specific suitability for the use of new Belgian cements) (FPS Economy and NBN)

NEPBC – Next generation building energy assessment methods towards a carbon neutral building stock (VLAIO - Flanders)

Nuisances sonores de type claquement dans les menuiseries aluminium (Slamming noise in aluminium joinery) (BBRI)

OPTIDIM – *Vers une méthode pour déterminer la charge thermique nominale des systèmes d'eau chaude sanitaire dans le secteur résidentiel* (Towards a method for determining the nominal heat load of domestic hot water systems in residential applications) (FPS Economy and NBN)

Out2In – *Impact des techniques de filtration et de purification de l'air sur la pénétration des polluants de l'air extérieur par ventilation pour améliorer la qualité de l'air intérieur dans les bâtiments durables* (Impact of air filtration and purification techniques on the penetration of outdoor air pollutants via ventilation to improve the indoor air quality in sustainable buildings) (Innoviris - Brussels)

Outil de calcul de développement pour le drainage des eaux pluviales (Rainwater drainage sizing tool) (BBRI)

Outil de liaison des coûts et de la planification (Tool for linking costs and planning) (BBRI)

P-RENEWAL – *Rénovation énergétique du bâti wallon d'avant-guerre à valeur patrimoniale* (Energy renovation of prewar Walloon heritage buildings) (DG04 - Wallonia)

PEPSE – *Conception, développement, validation et mise en service d'un poste d'essai semi-virtuel pour le test de systèmes de production, de stockage et de distribution d'énergie* (Design, development, validation and commissioning of a semi-virtual station for the testing of energy production, storage and distribution systems) (ERDF - Wallonia)

Poussée des acrotères en toiture plate et dilatation de l'isolation PU (Thrust of flat roof parapets and expansion of PU insulation) (BBRI)

Prio-Climat – *Priorisation et optimisation des stratégies de rénovation dans le logement social : vers un meilleur climat intérieur* (Prioritisation and optimisation of renovation strategies in social housing: towards a better indoor climate) (ERDF and Innoviris - Brussels)

RECURWOOD – *REnovation and REdevelopment in a Changing URban environment using WOOD* (VLAIO - Flanders)

REINFORCE – *Armature minimale des éléments de dalle de béton* (Minimum reinforcement of concrete slab elements) (FPS Economy and NBN)

RETROFIT – *Développement de solutions innovantes pour la rénovation des fenêtres. Cas du retrofit (remplacement du vitrage seul) par un nouveau vitrage sous-vide super isolant* (Development of innovative solutions for the renovation of windows. Replacement of the glazing with new super-insulating vacuum glazing) (SPW EER - Wallonia)

Rinçage des conduites d'eau potable (Flushing of drinking water pipes) (BBRI and BCCA)

SBO EcoCities – *Green roofs and walls as a source for ecosystem services in future cities* (FWO - Flanders)

SCLT – *Développement d'un panneau sandwich composé de CLT (Cross Laminated Timber) et d'une âme isolante participant aux propriétés mécaniques* (Development of a sandwich panel consisting of CLT (Cross Laminated Timber) and an insulating core contributing to the mechanical properties) (SPW EER - Wallonia)

SCoolS – *Sustainable Cooling Systems* (CORNET via VLAIO - Flanders)

Smart Buildings Illustrated – *Études de cas documentées* (Documented case studies) (BBRI)

Smart Buildings in Use (VLAIO - Flanders)

Smart Maintenance (BBRI)

SmartPower – *Puissance correcte pour le chauffage des bâtiments* (Correct capacity for the heating of buildings) (FPS Economy and NBN)

SOLIS – *Cadre normatif et critères d'utilisation pour l'isolation appliquée sous chape* (Normative framework and criteria for the use of insulation under screeds) (FPS Economy and NBN)

SOLRENF – *Remblais renforcés* (Reinforced embankments) (FPS Economy and NBN)

STOCC – *Stockage de chaleur par matériaux à changement de phase* (Heat storage using phase change materials) (ERDF - Wallonia)

SWW 2.0 (VLAIO - Flanders)

TASSEMENT CELLULOSE – *Tassement des isolants insufflés et en vrac* (Compacting of blown and loose insulation materials) (BBRI)

TERRASSE EN BOIS (BBRI)

To bio or not to bio (VLAIO - Flanders)

Towards Smart Ventilation in Midsized Buildings (VLAIO via Flux50 - Flanders)

VENT TOITURES – *Résistance au vent des toitures. Evaluation en labo et in situ* (Wind resistance of roofs. Laboratory and on-site evaluation) (BBRI and BCCA)

Wonder Walls – *Facilitating green façades* (VLAIO - Flanders)

LIST OF PROJECTS IN 2020

In order to meet the requirements of the sector, the BBRI collaborates on various research projects and awareness initiatives. These projects are supported by the following bodies:

EU Horizon 2020

Interreg 2 Seas Mers Zeeën

Interreg North-West Europe

cornet

Life

BCCA

Belgian Science Policy Office belspo

economie

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Researches • Develops • Informs

Primarily financed through the membership fees of some 95,000 Belgian companies, representing almost all of the construction trades, the BBRI has been considered the leading scientific and technical institute for over 55 years, contributing directly to the improvement of quality and productivity.

Research and Innovation

The introduction of innovative techniques is vital for the survival of an industry. Oriented by the construction professionals, contractors and experts sitting on the Technical Committees, the Institutes's research activities are closely aligned to the day-to-day needs of the sector.

With the help of various official bodies, the BBRI encourages companies to innovate, by offering advice in various fields that is tailored to the current challenges.

Development, standardisation, certification and approval

At the request of public or private players, the BBRI also works on various development projects under contract. Actively collaborating in the activities of the standardisation institutes – on the national (NBN), European (CEN) and international (ISO) levels – as well as in those of bodies such as the Belgian Union for Technical Approval in Construction (UBAtc), the Institute is ideally placed to gain insight into the construction sector, and thus to better respond to the future needs of the various construction trades.

Dissemination of knowledge and support to companies

The BBRI makes extensive use of information technology in order to efficiently share the results of its work with all companies of the sector. Its website, adapted to the diverse needs of construction professionals, contains the publications of the Institute as well as more than 1,000 construction standards.

Personalised training and technical assistance contribute to the Institute's commitment to disseminating information. Alongside some 750 information sessions and thematic conferences involving the BBRI's engineers, over 18,000 advice notices are issued each year by the Technical Advice Division.

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