YEARBOOK 2020

SUPPORTING THE USE OF STRAW IN URBAN AND PUBLIC BUILDINGS

Interreg North-West Europe
UP STRAW
European Regional Development Fund

UP STRAW

FOREWORD

Dear Reader,

This is the 2020 UP STRAW Yearbook. This yearbook is the final book to be published during the Interreg NWE funded UP STRAW project (2017-2021).

The theme of this yearbook is 'public investment in building with straw' and should, we hope, inform and inspire you about the application of straw as a building material for a wide range of public buildings. In this document you will find articles that have been written by members of our project partners (France, United Kingdom, Belgium, Germany and the Netherlands).

In presenting this yearbook, we would like to thank all contributors. We hope you enjoy this publication.

From the UP STRAW project partners

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01 INTRODUCTION

Interreg North-West Europe
UP STRAW
European Regional Development Fund

Our society is facing many economic, social and environmental challenges. Eco-construction and, specifically, straw building provide solutions that offer high-quality economic development, social well-being and respect for the environment.

As a public officer in a regional or local authority, your role is essential. When public authorities are aware that profound reforms are needed they can provide the impetus for tangible, long-term action that then becomes mainstream. Change is needed if it is synonymous with positive development. Much progress is, however, still possible and desirable within the field of construction - a sector that directly influences our quality of life and that of future generations.

Our regions have the resources, companies and know-how needed to meet the demand for innovative buildings that are beneficial for sustainable development of the economic fabric.

Public procurement is a true driver for change in the construction sector and can play an essential role in raising the status of local companies and resources.

In this introduction, we will present the advantages of building with straw and the reasons why it is necessary or even indispensable to integrate it into our buildings.

Eco-Construction: an underlying trend but...

Recent years have seen a growing interest in more environmentally-friendly solutions. The construction and construction materials sector are no exception. The general public is also influenced by many factors.

Energy savings are at the top. The cost of energy and ever more stringent regulations have progressively made potential builders and renovators more and more conscientious - a building that uses little energy is essential. Additionally, health-related aspects are increasingly visible in the choice of materials. Handling products during the construction phase that are nice to touch and, above all, pose no health risks, is no longer a luxury. Many members of the public have understood the benefits of living in a healthy inner climate.

Finally the slow trend has also affected the construction sector. Why buy products produced on the other side of the world when products with positive effects are produced locally? This is the short circuit economy which has significant benefits for the economy of a region which is thus supported.

However, despite having companies at the cutting edge of technology, the volume of eco-materials used in construction and renovation is still low (less than 10%) in comparison to petrochemical materials. The sector has, in fact, been hampered, by falling victim to various misconceptions and prejudices, with regard to quality and performance. Increased awareness-raising and communication are indispensable for developing the use of eco-materials and straw for construction and renovation.

Why Choose Straw Building?

Straw building offers tangible solutions for the creation of high-performance buildings that are cost-effective, comfortable, long-lasting and have minimal negative impacts on the environment. The idea of building or renovating with straw is not new. Long-lasting straw buildings have been around for

several generations and remind us that the use of this material is a guarantee of quality. This is true of the famous Feuillette House in Montargis (France). We simply forgot for a time that our builder's DNA can be expressed at its best in association with nature. The era of rapid reconstruction following the Second World War deemed concrete and oil-sourced materials as the holy grail of construction. It was wrong. The rapid degradation of some structures and the depletion of non-renewable primary materials, such as sand, remind us that there are other ways.

Technical Performance in the Forefront

- Straw is a perfect insulator

Straw allows walls with very high thermal resistance to be designed. There are now many examples of passive straw buildings and their performance has been measured and proven.

- Straw regulates humidity

Building humidity management depends on several factors, including the use that is made of the building, regular and appropriate ventilation and the materials from which the building is made. Straw absorbs and releases humidity much more than oil-sourced or conventional materials. This improves the inertia of the building and provides greater comfort.

- Straw does not comprise any Volatile Organic Compounds (VOC)

The air inside buildings is more polluted than the air outside but we spend 70 to 90% of our time in closed buildings. Research projects have shown the potential consequences on health associated with this pollution and have identified the presence of VOC in the inside air as a particularly toxic factor.

- Straw is fire resistant

Straw offers fire safety levels that are equivalent or better than conventional materials. A straw wall coated on both sides can reach a fire resistance from 1.5 to more than 2 hours. What is more, it does not release any toxic gases in the event of a fire, which is vital since most injuries and deaths are associated with inhalation and asphyxia and not the fire itself.

- Straw provides superior acoustic and thermal comfort

Temperature stability is key to the comfort of a building. A coated straw wall provides considerable thermal comfort. Since it is a strong insulator there is no cold wall effect and no overheating in the summer. As a general rule, eco-materials absorb sound very well. They contribute to a serene ambiance within the building.

Local Economic Development and Raising the Status of Local Products

Our regions have many natural resources with vast potential for economic development. Most builders of wood/straw buildings find suppliers for straw bales within a few dozen kilometres of their workshop and do not need much transportation. This local product may contribute directly to the ecological transition of construction, without affecting the agricultural branches or other uses for straw. This provides diversification and additional income for the agricultural world.

Comfort and Health

A healthy and comfortable building should be a right and not a luxury. A study carried out by Approche-Paille (FR) in 2018 shows that 93% of users of straw buildings are satisfied or very satisfied with the level of comfort in their buildings during the summer. However, since the buildings are well insulated, winter comfort is no longer a problem but overheating in the summer has become a major factor that must be anticipated now since heat waves are becoming more and more frequent.

Environmental Benefits

The environmental impacts of a building reach well beyond the energy consumption associated with its use. The extraction, transformation and deployment of the construction materials also entail significant consumption of resources and energy, not to mention the costs associated with deconstruction and the processing of any waste at the building's end of life.

It is therefore important to be vigilant about the environmental impact of the materials used.

Products such as wood, straw and clay allow buildings to be built that consume very little energy and have a very low environmental impact. At the end of its life, wood can be recovered or incinerated, straw can be composted, and clay can be returned to the ground.

How should we, as a public authority, encourage straw building?

We have just demonstrated this. Our choice of building influences the development of our society. Straw building currently needs more projects and recognition for it to be disseminated more widely. Public entities, as influencers, builders and users of buildings, have much to contribute and can serve as an example to others. They have the tools needed to build exemplary buildings today that will become the norm tomorrow.

Public procurement has a very significant impact on the construction sector and is a way in which local authorities can promote a sustainable and strong local economy. Exemplary public straw buildings may lead to demand from other influencers and thereby create a positive snowball effect for the sector.

5 exemplary buildings, subject to public procurement procedures, have been built or renovated using straw are presented in the pages below.
We will also present resources developed by the Interreg NWE UP STRAW project partners to encourage you to replace your building methods with something that is local, of high-quality and environmentally friendly.

02 5 EXEMPLARY BUILDINGS WITH PUBLIC PROCUREMENT PROCEDURE

Exemplary public straw-built buildings may lead to demand from other influencers and therefore create a positive snowball effect for the sector but the criteria within the call to tender must be revised and enriched. What needs to be changed? Do you have any examples of projects that worked? In this chapter, we will share experiences obtained whilst building or renovating buildings using straw within public procurement procedures.

The actual cost of straw building

The cost of a building is more than just a number. It is also construction quality, comfort and quality of use over many years, along with energy savings and low maintenance costs. Qualified labourers and high-quality architecture and materials, of course, come at a price but economically, the choices should lean towards a quality/price balance based on the criteria defined by the project owner. A higher-quality building may well represent an investment in the short term and turn out to be more attractive in terms of overall cost over the long term.

Likewise, the savings in hidden costs for the project owners, public finances and the community, such as those given below, should not be underestimated:

- Workshop pre-fabrication, very common for straw building, means the building goes up at speed on the worksite so there is less transportation, less pollution and the traffic around the worksite is not significantly affected;
- A building where it is pleasant to work, which is both comfortable and healthy reduces employee absences, thus paving the way for increased productivity;

- A building that does not use much energy means less pollution and greenhouse gas emissions and, therefore, a better environmental balance;
- A locally-sourced primary material is easy to break down, provides more possibilities for re-use or recycling and, therefore, leads to lower waste management costs in the future.

Using appropriate public procurement procedures

Most professionals in the straw construction sector are currently very small microbusinesses or SMEs (Small and medium-sized businesses) that are reluctant to tender for complex public contracts. It is therefore necessary to use simple procedures that will encourage such businesses to respond.

Give the tenderers time and resources

Design costs stand at approximately 2% of the total cost of a building. The design phase may, however, impact on the remaining lifecycle of the building. It therefore does not appear to be reasonable to reduce the design budget since the design will, in turn, affect 98% of the lifespan of the building. Calls to tender are generally not paid much or at all, whereas the requirements during this phase are becoming increasingly important. It is not easy to obtain high-quality or innovative work under such circumstances. Time is also important. The more closely a project is studied, the better it will be described in the specifications.

Five exemplary buildings at European Level

Within the framework of UP STRAW, a European Interreg project, buildings were built or renovated in each partner country in order to obtain feedback on the public procurement procedures. Five exemplary buildings in five European countries are therefore shown below. Each project is different, so as to allow a range of techniques and solutions to be showcased. They were all subject to public procurement procedures and were all addressed in meetings of experts in order to discuss the problems and successes encountered throughout the procedures and the construction phases. So many real-life examples - so many possibilities to positively change the way we build.

Interview with Hugues Delcourt, Project manager at the Cluster Eco-construction

2.1

Cluster Eco-construction Office (Namur - BELGIUM)

Design & Build public procurement procedure

The Eco-construction Cluster will have a new, straw-built, office building in 2021. What was the technical and legal process for this project? What conclusions should be drawn?

How is straw integrated into the thermal regulations?

There is an EPBD database that allows users to find out the thermal conductivity - the λUi - of different materials.A manufacturer has a specific value of λUi = 0.060 W/mK for straw. That value, however, can only be used specifically for straw bales that come from that manufacturer.

Uncertified straw bales must therefore use a default λUi value for the bio-sourced products:

- 0.06 W/mK for factory-produced heat insulation materials
- 0.08 W/mK for non-factory-produced heat insulation materials and heat insulating materials that take on their final form in situ.

The choice of one of these values can be discussed but the definition of 'in situ' in the regulatory texts corresponds to techniques for loose laying or blowing . The value of 0.06 W/mK is therefore more pertinent for straw.

Identity card

PROJECT TYPE :
Construction

BUILDING TYPE :
Office

CONTRACTING AUTHORITY :
Cluster Eco-construction

BUILDING MANAGEMENT CONSULTANT :
BEP

STAKEHOLDERS :
- General contractor : Mobic
- Architect : Helium 3 + Havresac
- Consulting engineers company : Homeco
- Health & security : Genie Tec Belgium

DELIVERY YEAR :
2021

NET USABLE AREA :
400 m^2

COST (total & €/m^2) :
840.000 € - 2.100 €/m^2

STRAW CONSTRUCTION TECHNIQUE :
Half-logs formwork compressing straw insulation

VOLUME OF STRAW USED IN THE PROJECT (m^3) :
121 m^3

DISTANCE BETWEEN STRAW SUPPLY AND THE PROJECT :
150 km

Are there any specific regulations for straw?

Belgium does not have any specific texts for straw building. The projects must respect the general construction regulations and foreign texts may be used to justify the construction solutions chosen. On a practical level, the Belgian public buildings built in straw are based on the French CP2012 rules and the German fire resistance tests.

Most of the chapters in the CP2012 rules have an introductory paragraph on the regulatory context and references. These chapters shall be covered in an addendum to the Biosourced Technical Specifications – Straw Building, presenting the regulatory equivalence between France and Belgium. The European standards are obviously common to both countries and the addendum shall provide the equivalence between the French Unified Technical Document and the Belgian Technical Information Note. Where possible, a search for Belgian documents that treat the same subject as the French DTU has been carried out but their content may differ. The addendum shall also comprise feedback on the specific practices in Belgium that diverge from the French approach.

How did you anticipate the supply and storage of the straw?

The original technique used for the Cluster building enabled many constraints to be removed.

The walls were built of panels comprising rectified half-logs. The straw was compressed between two panels to achieve the required thickness and density.

The building modules were prefabricated in a workshop, away from the elements. This process has two main requirements: the straw delivered must be very dry and it must be stored correctly. This construction method means the requirements associated with the density or the shape of the bales do not apply. The bales are opened, the straw is placed on the panels and compressed again to obtain the right density.

Are there any specific fire-resistance requirements?

The project and the construction system were presented to the fire department (fire prevention) before the planning permission request was submitted. The façades of this building must have a fire-resistance of 60 minutes. The thickness of the logs alone (approx. 160 mm) allow this resistance value to be obtained.

How did insurance companies react regarding insuring straw buildings?

Given the respect of the fire resistance standards and positive opinion of the Fire Department, this should not pose any problems. Given the state of progress on the site, the Cluster hasn't contacted the insurers specifically for this building yet but the insurance companies contacted at the beginning of the UP STRAW project did not express any particular reservations for these building systems.

Which procedure did you choose for awarding this contract? What are the advantages and disadvantages?

The public procurement procedure was launched in August 2018. We decided to use a Design & Build procedure to cut down on planning. This allowed us to launch only one call to tender for a team comprising both architects and contractors.We received two tenders on 7 November 2018 but had to refuse them owing to non-compliant administrative files (missing or incomplete documents). The Eco-Construction Cluster Working Group decided to restart the tender process.

We spoke with some professionals, mainly architects, who could have submitted a tender but chose not to do so. What was their main reason for their choice? The significant amount of time that had to be invested in a Design & Build procedure, which represents a high risk for a small company with small cash flow. The second highest reason was that the call to tender required at least one reference for straw building for the architect and one for the contractor. Since the straw building market is still in its early days, only a few teams could be created based on this criterion.

The Design & Build process involves the signing of a contract with a team comprising an architect and a general contractor but the general contractors are not usually interested in small projects and haven't mastered the straw techniques and so they tend to considerably overestimate their tenders… when they do submit a tender.

We interviewed a team that worked on a tender but which ended up deciding not to submit it. The company is well known for its wood construction work, CLT panels and glue-laminated applications. It is also currently developing a straw/COT wall product. They deemed, however, the requirements for straw building references to be too high. It is true that the call to tenders required a turnover of €125,000 for the architect and €300,000 for the contractor, in addition to the straw building reference. These requirements are high for Wallonia, thus significantly restricting the number of potential applicants.

Conclusion

The Design & Build procedure is reassuring for the Project Owner because it provides an impression of safety regarding the schedule and the budget. In practice, however, a project is never hitch-free, no matter what procedure is used.

The Design & Build principle is interesting if we want architects and companies to work together on unusual techniques. However, the complexity of public procurement procedures and the considerable workload for the preparation of these Design & Build tenders may discourage companies that don't have the cash flow needed to cover the risk of losing the tender.

The Project Owner who wants to save time will not take the risk of launching a call to tender procedure with separate batches, in which the entire consultation may be cancelled if a batch doesn't provide results. The procedure therefore favours general contractors to the detriment of more local, small companies.

Finally, this procedure holds back creativity. The requirement for a fixed estimate during the tender phase pushes the successful tenderers to propose solutions that they know and master completely. They avoid proposing original solutions that would cause them to take too many risks in terms of the budget or the techniques to be mastered.

This procedure is therefore more adapted to large conventional projects that involve major construction players. It should, however, be discouraged for ambitious and original projects that want to showcase local small businesses.

Interview with Wouter Klijn, Strobouw Nederland

2.2 De Roomley Sports-hall (Udenhout - NETHERLANDS)

The largest renovation with Dutch straw

What was the reason for renovating a sports hall with straw?

In 2016, Strobouw Nederland (The national association for building with straw) invited the municipality of Tilburg to participate in the Interreg-NWE project with straw: UP STRAW. A joint inventory was made to see which of the more than 150 buildings in the municipality of Tilburg were most eligible for a pilot renovation with straw. De Roomley was selected as the best option at that moment because there was already a budget for mid-life maintenance on larger parts of the building due to its age.

Was it a logical choice to renovate with straw as insulation?

The use of straw in the built environment was still a completely new idea for the Municipality of Tilburg at the time. Ultimately, however, it tied in seamlessly with ambitions the municipality has been embracing for over 10 years. The current ambition was identified in 2016 within a "roadmap" towards "sustainable building exploitation" using the end of 2020 as the first evaluation point.

Identity card

PROJECT TYPE :
Renovation & extension

BUILDING TYPE :
Sports facility

CONTRACTING AUTHORITY :
The Municipality of Tilburg

BUILDING MANAGEMENT :
Real estate department Tilburg

STAKEHOLDERS :
- Design : Spacetranslators
- Installation advice : W-inst
- Main contractor : Van Der Weegen
- Prefab wood constructions : Barli

DELIVERY YEAR :
2020

NET USABLE AREA :
2.568 m^2

COST (total & €/m^2) :
2.850.000 € - 1.100 €/m^2

STRAW CONSTRUCTION TECHNIQUE :
Prefab sections with 32cm blown in straw

VOLUME OF STRAW USED IN THE PROJECT (m^3) :
260 m^3

DISTANCE BETWEEN STRAW SUPPLY AND THE PROJECT:
250 km

How did the use of straw become part of a renovation?

The first idea was to "wrap" only Roomley's two halls. This wrapping would require less energy to heat the building in the winter and would remain much cooler in the summer. The lower part of the building would be excluded from this renovation.

However, a major investment in a 40-year-old building requires a broader perspective. Therefore, a new plan was developed for a mid-life upgrade to a "zero-on-the-meter building" following the newly defined roadmap towards sustainable building exploitation.

Has the use of straw led to a different project approach?

When building with straw, the project approach does not have to be different from usual. Knowledge of the application of straw was already guaranteed through the partnership with Strobouw Nederland and other members of the UP STRAW project. And by working with companies who are committed to innovation, planning is progressing smoothly.

Was it easy to get the building permit?

There were no obstacles, not even to the use of straw nor with regard to fire safety. Only obtaining approval for the new appearance was an intensive process.

And how did the tender go?

It was a challenge to find companies willing to make an offer. During the first tender it became clear that the requested renovation could not be done within the budget. After changing the scope, a second tender resulted in one offer but this was still above budget. After approval was given to negotiate feasible savings, this ultimately led to a quotation that was feasible within an additional budget.

What were the lessons learned from the tender?

A project of fairly great complexity, with some unknown elements such as the use of straw, required intensive collaboration. The involvement of local partners made a big difference in this. And renovating a building that is in use was a much more challenging project than a completely new construction.

Did building with straw present an extra challenge?

Compared to other aspects of the renovation, building with straw has had little effect on the overall process. Discussion about the behaviour of moisture in straw was ultimately resolved with an extra film behind the straw, which is actually not necessary, but can be labelled "the exclusion of risk". For almost all parties involved it was the first time they were involved in a construction with straw.

How was the choice made for blowing in straw?

In the design phase of this renovation, together with the Interreg UP STRAW partners, many possible options for renovating with straw were examined. Designers of exemplary buildings in the UK, France and Switzerland were asked to share their experience to support the design process in the Netherlands.

Building with straw bales on the construction site was soon ruled out due to logistics, manageability and practicality. Options for using standard prefab elements seemed to fit better due to shorter installation time. However, research also showed that the existing brick facade was not strong enough to support the prefab elements. By using larger sections, these can be linked to the existing steel construction. The use of blown-in straw gives maximum design freedom in wall thickness and wall construction and the timber frame builder does not have to adjust their way of working.The expected potential of blown-in straw for use in other situations also contributed positively to the choice.

What were the requirements in terms of fire protection?

Based on a fire-load-calculation there was no need to partition the building below 1000m2 and a D-class facade is required for the fire safety of the building. With an open wooden facade, the straw must therefore be covered with a minimum D-class material. And because straw is only an E-class insulation material, a C-class wood fibre insulation board was chosen (1 class higher than required). For this, the newly introduced Gutex Pyroresist was used.

What were the challenges in the production of the straw insulated walls?

The 7-metre-long and almost 3 metre high elements were filled with straw during manufacture at Barli in Uden: a local wood-construction company. To avoid any risk of the straw settling during transport from Uden to Udenhout, the straw was blown in with 10% extra density. For the team at Barli it was a totally new element in their fairly traditional production process.

To control the quality of the straw elements several tests were executed and registered. During a pilot stage the moisture of some sample elements on the outside of the existing building was monitored. During blowing in the straw in Uden the volume of the straw was registered to calculate the density. After installation on site the straw was checked for settling by opening several elements for a visual check.

Were there planning challenges due to the use of straw?

The use of blown-in straw turns out to be an easily adaptable process. Blowing in straw turned out to be too dusty for the production environment at Barli. Blowing in could, however, still be carried out with additional measures for shielding and extraction.

It also turned out to be very important, for planning, to blow in some elements on location; then the circumstances are less favourable than for the timber frame builder but the planning remains appropriate.

Were there any technical requirements for the use of straw?
Blown-in straw is a material that meets the required insulation value within the margins of blown-in. The straw is processed dry and packed into blown straw. The packaging provides adequate protection for transport and storage. Once blown into the element, the straw is already well protected against weather influences. After installation in the facade, the prefab elements are also further protected against the weather.

The construction of timber frame elements, and filling them with straw, can best be carried out in a covered workshop. But if this is not possible, the straw can also be blown in on the construction site. Weather influences can then determine earlier if work should be postponed or the blow in aperture should be protected from rain.

For the energetic ambition of "zero on the meter", an insulation value of at least Rc = 7 is required. Because the quality of the building's existing insulation turned out to be relatively poor, calculations were only made with the new facade to meet the requirements.

Will this project be an example for others to use straw for a public building?
If you really want to serve our actual climate and if you want to preserve natural resources for future life on earth, building with straw and wood is one of the best options you have. The knowledge and experience for success is available, you only have to use it.

2.3 Hastings Visitor Centre (Hastings - UNITED KINGDOM)

Sustainable straw building for the future

The 'Bale House' is the new Visitor Centre in Hastings Country Park Nature Reserve, funded by Hastings Borough Council with grant aid from the Interreg NWE programme.

This unique straw bale building is in one of the most stunning coastal landscapes in the UK.

It is the first public straw bale building in Hastings and will act as a community facility and café with interpretation that showcases the management of Hastings Country Park Nature Reserve.

From the foundations to facade, it is constructed from natural and recycled materials which are healthy, fireproof, breathable, and they lock up carbon from the atmosphere, recycling agricultural by-products. It requires next to no energy to run and due to the level of insulation will require no additional heating to keep people comfortable.

This sustainable and exemplary building was designed by Cave Cooperative architects and built by a consortium of straw building specialists led by Huff and Puff Construction and Green & Castle.

Identity card

PROJECT TYPE :
Construction

BUILDING TYPE :
Country Park Visitor Centre

CONTRACTING AUTHORITY :
Hastings Borough Council

BUILDING MANAGEMENT:
The Cave Cooperative

STAKEHOLDERS :

- Architect: The Cave Cooperative
- Contractor: Huff and Puff Construction
- Sustainable management: Green & Castle
- Centre managers: Groundwork South
- Design & build consultancy: Red Kite

DELIVERY YEAR :
2020

NET USABLE AREA :
225 m^2

COST (total & €/m^2) :
900.000 € - 4.000 €/m^2

STRAW CONSTRUCTION TECHNIQUE :
Hybrid Load Bearing

VOLUME OF STRAW USED IN THE PROJECT (m^3) :
80m^3

DISTANCE BETWEEN STRAW SUPPLY AND THE PROJECT:
100 km

Background

At the European Straw Bale Gathering in 2015, the School of Natural Building (SNaB) was invited to become a partner in a bid for Interreg funding, which ultimately became UP Straw. Each UP Straw partner searched for an organisation who wanted to build. SNaB had previously had conversations with Cave Cooperative architects who had been asked to design a Visitor Centre for Hastings Borough Council. SNaB introduced Hastings Borough Council to the UP Straw project via Groundwork South. The rest, as they say, is history…

Public procurement and the build process

Work started in 2019 as the first tyres were filled and a frame of heavy Douglas fir beams to hold the bales was put together. The planning process began 5 years earlier. The challenges tackled by the project team have generated valuable lessons for public authorities wanting to build future-proofed energy-efficient structures.

To make it possible, the tender process was adapted to suit the needs of this ground-breaking project. After two invitations to tender failed, the council reached out to sustainable contractors to form a consortium of straw bale builders. Murray Davidson, Project lead from Hastings Borough Council says, "The council took a risk and spent a lot of time making the project work, but we have shown that straw bale construction can be a normal and central part of local authority procurement."

Councillor Maya Evans Lead Councillor for the Natural Environment and Leisure further comments, "Although constructing a new building from straw bales and sustainable materials present new and difficult challenges for the authority, it is a measure of our commitment to help address the climate crisis the planet faces." The challenges imposed by the global pandemic have delayed the construction. It is expected to be completed by the end of 2020 but not open until 2021 due to Covid restrictions.

Straw Supply and Storage

Following the council decision to build a straw bale centre, 80 cubic metres of straw were procured in 2016. The straw was stored in council-owned farm buildings at Hastings Country Park, where it remained in excellent condition until needed in 2019.

Construction Method

Phil Christopher from Huff and Puff Construction describes the method of construction, "The building was originally envisaged as load bearing straw bale, however we used a method where we erected a lightweight timber frame first and then infilled the straw. Essentially the framing is identical to robust load bearing methods, just with more posts.

I often refer to this method as a hybrid, since the straw is still a structural part of the walls, both for load and racking. This method was a good fit for our teams and for the site - which is incredibly exposed, being over 150m above sea level and on the edge of a cliff. We experienced winds of approximately 70mph about six times over the course of the build and anchoring the building solidly was imperative."

Fire Regulations

John Butler is a Sustainability Consultant who says, "Straw must comply with the same requirements of building regulations as any other building material. This is divided into requirements for Reaction to Fire (how quickly flames spread, and how much smoke and/or flaming droplets are produced) and Resistance to Fire (how long an element contains fire on one side of it without losing structural integrity). The exact requirements vary depending on the situation.

Formal certified tests have found the following compliance for straw bale walls:

- Reaction to fire: clay and lime plastered straw bale wall systems have achieved ratings of B-s1, d0.
- Resistance to fire: clay and lime plastered straw bale walls (all incorporating timber elements in differing ways) have achieved formal test results of 120 to 135 minutes without failure (equivalent to REI 120 to 135)."

Phil Christopher adds: "The usual care was taken during construction to remove loose straw at every opportunity and take it well away from the building. Finished walls were sheeted for protection and rendering/ plastering started immediately after the straw installation was completed, limiting as far as possible any opportunities for fire damage."

Energy Efficiency

"Straw has a measurable range of thermal conductivity which is commonly accepted by UK building regulations in the calculation of building u values [the rate of transfer of heat through a structure]. The low u value is an attractive property of straw as an element of sustainable design. This may have been a factor in the support for its use at Hastings, as well as straw's other qualities as a breathable and local material." (Nico Smith, Red Kite Design & Build)

The Future of the Bale House

Educating visitors about this unique part of the Sussex coastline, its geology, flora and fauna and local history will be combined with social projects, coordinated by local charity, Groundwork South, on behalf of the council. "Local people are central to the creation and development of the Bale House as a thriving hub." (Teresa Flower, Groundwork South). "Volunteers will support the running of the Bale House, the maintenance of landscaping around the building and will be actively encouraged to be part of wider conservation and heritage volunteering and educational activities".

The Bale House is a flexible space that can respond to the community's changing needs. The building will demonstrate sustainability through adaptability. Groundwork believes the work "to make green spaces more accessible to the wider community is particularly important in supporting Covid-19 recovery".

Connecting people to their environment allowed the centre to be built, and this relationship will ensure the future success of the Bale House. The team hope that lessons learnt will encourage other public authorities to look at smaller specialist sustainable contractors for their public buildings.

Hidden Hastings Heritage is one of these projects. Funded through the Heritage Lottery fund this project is working across generations to improve access to the park. The Education Officer and Conservation and Volunteering Officer are based in the park and are working on improved and new interpretation, signage and pathways connecting the wider park to the Bale House. Alongside this they are developing educational resources to engage with schools, children and families and recruiting and inspiring local people to build a team of committed volunteers to lead conservation and heritage activities out of the Visitor Centre.

Another project is Greener Futures, funded through European Structural and Investments funding, which will support residents who are the most vulnerable or furthest from being able to access employment to move closer to the labour market or access work.

Interviews with Anne-Laure Nogué, Project manager at ITG Construction & Aymeric Prigent, Technical Director at ACCORT-Paille

2.4 Centre National de la Construction Paille (Montargis - FRANCE)

Construction of a training centre and restoration of a building

For its project, the Centre National de la Construction Paille (CNCP) opted for a bio-climatic design and an overall performance close to that of passive construction. This was made possible thanks to the exceptional qualities of the straw material used for both sites. In France, the straw construction market is growing, with around 500 new constructions per year, involving all types of buildings: individual and collective housing, "establishments open to the public" (ERPs), tertiary buildings, educational establishments, agricultural and industrial buildings, etc.

There are rules which professionals can rely on for their straw construction projects: the Professional Rules for Straw Construction, the EPBD database linked to the use of straw as a building material, drawn up as a prelude to the future regulations (RE2020). In terms of fire resistance, straw, like other materials, must meet specific requirements. For our project, the ERP classification of the site is the constraint in terms of construction work.

The CNCP procured a project management consultant team managed by Anne-Laure Nogué, to help in the building programme.

Identity card

PROJECT TYPE :
Restoration and new construction

BUILDING TYPE :
Training centre

CONTRACTING AUTHORITY :
Centre National de la Construction Paille

BUILDING MANAGEMENT:
ITG, Entrevues, Acecotech

STAKEHOLDERS :
- Architect : Vivarchi
- Thermal and fluid design office: Treenergy

DELIVERY YEAR :
2021

NET USABLE AREA :
315 m^2

COST (total & €/m^2) :
920 €/m^2

In this interview, she explains about the work of a Building Management Consultant who specialises in straw and how she organised her mission for the CNCP project.

What is a Building Management Consultant who specialises in straw?

It is primarily operational support with sufficient knowledge of the specificities of the material to anticipate, for example, the sourcing of contributors, a coherent budget envelope, a schedule for implementation during the summer months, storage capacity, implementation logistics, etc.

What is the benefit for the project owner of this specific support?

The ability to accompany and advise a novice project owner in the use of straw as a construction material is vital. Other benefits are a good understanding of the needs of various project contributors and the link between experienced professionals and those using straw for the first time.

How can a Straw Building Management Consultant contribute to public procurement?

By highlighting feedback from previous straw constructions, by drawing up an operating programme open to bio-sourced solutions, by advising on suitable purchasing strategies, and by ensuring that consultation documents are consistent with the project owner's strategy in terms of the final performance.

Are there specific requirements for this type of project with identified skills and know-how?

Not to my knowledge for the CNCP project. For this project, the specifications did not impose any requirements. However, at the very least Pro-Paille training was mandatory as well as a knowledge of eco-construction themes. In public procurement related to an architect, for example, Pro-Paille training was compulsory and the references and experience of the candidates spoke for themselves, demonstrating their full mastery of one or more techniques!

Your work at the CNCP has integrated a reflection on a building to be renovated listed as a public heritage building and a new construction. What is the feedback on this project?

This project for the CNCP starts in feasibility/pre-programme and continues until the architect submits the building permit, so it is a mission in the preliminary phases. The context is quite particular since the project owner is an NGO of straw builders. No need to convince them that building with straw is possible, that it is legitimate, that the sector is organised and dynamic!

The registration of the "Feuillette House" and its barn as a public heritage building does not call into question the work decided at this stage. A consultation is initiated with the relevant services (town planning, architect of the Ministry of Culture etc) to ensure that nothing will stand in the way of constructing the CNCP training centre in Montargis. In all projects, voluntary consultation is a crucial step in making the planning elements known and adjusted.

Why did you wish to respond to this call for tender? What appealed to you?

It's a desire to develop my work as a Building management consultant and to offer an alternative to decision-makers, as well as the choice to move towards the best environmental solutions. Within the context of the UP STRAW project, we were able to share our respective practices between our five partner countries.

A Building Management Consultant who specialises in straw is not a role yet developed among our partners, but rather takes the form of technical experts and legal advisers for public procurement processes.

Thanks to the partnership working in the UP STRAW project and the increases in the number of straw buildings, we can hope for the development of this role in the future.

The following interview with Aymeric Prigent reports on the experiences of the ACCORT-Paille agency, for which building management consultancy in straw has been a speciality since 2016.

What is a Building Management Consultant who specialises in straw?

The use of straw bales, a non-industrialised agricultural material, is today a challenge for most players in the building sector. It is a material with many advantages but also very specific constraints and a supply network totally outside the usual channels of the construction sector. Despite the training of various players, as the techniques and projects are all unique, there is a real need for support throughout the project to ensure that it runs smoothly. Building management consultants who specialise in straw facilitate the work of all those involved and ensure that the project goes well. They also ensure that important information circulates well and that professional rules are followed. They can also act as a contact person for control offices, insurers and other safety committees to ensure that the rules for designing and using straw material are understood and applied.

Are there specific requirements for this type of project with identified skills and know-how?

There are no national or shared specifications, but for 4 years now, ACCORT-Paille has been developing its processes and methods to offer different types of project management the support that best suits them.
Obviously, this requires people engaged in the project to be "Pro-Paille" trained. This then goes much further: they should master the professional rules of straw construction perfectly as well as the associated regulatory knowledge (wooden structure, thermal, fire safety, etc.). It is also very important to have real experience in the field to know what is realistic or not. The building management consultant cannot be at a distance, they must be in contact with companies and designers at all times.

Since you have been working in this field, what can you tell us about your experiences?
Feedback is very positive as often the straw building management consultancy allows us to provide solutions in related areas.

For example, on a project that I am involved in, thanks to the contribution of a global vision, we noticed that the heat release from the server room could be used to heat the building and that we could thus eliminate the heating system initially planned. This is a good example of how to turn a problem into a solution and thus save on the bottom line.This was possible because the building has a very low heat requirement due to its straw insulation.

Is a training course for straw building management consultants conceivable?
In the long term perhaps, but today it is more a question of field training accompanied and monitored by experienced people.

Is there more project management assistance for building with straw and other bio-sourced products?
Yes, that's for sure, as the act of building is becoming increasingly technical and complex, building management missions are developing in all fields, but especially on innovative subjects: HQE labelling, biodiversity, bio-sourced products, etc.

How do you see the bio-sourced market in the construction and renovation sector in France?
It's a market that is very unequal depending on the territories. Some regions use them a lot and others very little, but generally speaking, we can see a strong increasing trend.

As far as straw is concerned, we have no concern in terms of quantity of resources and supply, but we are beginning to see that the limit of development will be that of the timber construction sector, which needs to increase in power everywhere in France.

Interview with Brother Andreas Schmidt, OSB, project manager and representative of the builder „Benedictine Abbey Plankstetten".

2.5 Benedictine Abbey Plankstetten (Berching - GERMANY)

Monks build the largest straw bale building in southern Germany with their own wood and straw

Why did you build a new building in your monastery?

Since 1998, the historical and listed monastery buildings have been renovated in several construction phases. The new building - «Haus St. Wunibald» - is a sub-project of the general renovation of our Benedictine Abbey. We need the building to accommodate our guests while the existing rooms are being renovated and we also want to increase the number of our guest rooms in general. The multi-purpose building will also house the parish administration and a kindergarten.

You have chosen to build with straw because it meets your spiritual mission to preserve creation. Did you encounter any resistance?

At the very beginning the project team was sceptical about what we monks had in mind, and even the sponsors had reservations. But we stubbornly stuck to our goal of building in an ecologically sustainable manner using our own raw materials.

Identity card

PROJECT TYPE :
Construction

BUILDING TYPE :
Multi-purpose building

CONTRACTING AUTHORITY :
Benedictine Abbey Plankstetten

STAKEHOLDERS :
- Architect: Hirner + Riehl Architekten BDA
- Structural design: LERZER ING + Plan GmbH
- Construction management: Engineering office Seibold + Seibold
- Timber & straw construction: Holzbau Bogner GmbH

DELIVERY YEAR :
2021

NET USABLE AREA :
1.555 m^2

TOTAL COST :
6.000.000 € - 3.858€/m^2*

STRAW CONSTRUCTION TECHNIQUE :
Wooden stand construction with straw bale infill made of prefabricated elements

VOLUME OF STRAW USED IN THE PROJECT (m^3) :
300m^3

DISTANCE BETWEEN STRAW SUPPLY AND THE PROJECT:
5 km

*The costs include expenses related to special requirements for fire protection, cultural heritage protection and the geological hazard of a landslide.

You needed 300 m³ of straw for the new building. Did this come entirely from your farm?

Yes, it was important for us to use our own straw as a building material. That way we ensured organic quality and benefited from short procurement channels. With the mobile pressing machine of the Austrian company SonnenKlee GmbH we produced over 2000 small straw bales on site from our big bales and had them designated as building material by Baustroh GmbH. The finished bales were temporarily stored in our barns.

Where do the 400 m³ of construction timber come from and what kind of wood did you use?

For both the shell of the building and the interior, we only use spruce wood, which comes 100% from our own monastery forest. Around 500 trees were carefully selected for this purpose.

Was it difficult to obtain the building permit for St. Wunibald?

No. However, it was helpful to coordinate with those involved in the construction process and with the relevant authorities before the official building application was submitted.

How did the public procurement process proceed?

Due to the budget size and the fact that subsidies make up a large part of the budget, a public procurement procedure had to be carried out according to European rules. The awarding procedure for the planning team was initiated in 2012 by a specialist in accordance with the awarding regulation. Contracts were awarded for planning, sector planning, construction management and building construction. The EU-wide tender was published on www.aumass.de.

Most of the companies awarded are regional business. What was the reason for this?

Due to the current boom in the construction industry, it was difficult to get enough offers at all. About 70% of the construction contracts were finally

Abbot Dr. Beda M. Sonnenberg OSB

awarded to companies within a radius of 30 km. This turns out to be advantageous for the construction project and the regional construction companies also benefit from the fact that they have short distances to the construction site, for example. In addition, the new St. Wunibald building is a prestige project for the contracted companies. In order to rule out the possibility of certain companies being favoured in the tendering process, the procedure was highly transparent. One measure to ensure this was to link the Internet platform for EU-wide tenders to the monastery website. This way every website visitor could find out about the trades being tendered for.

Were there any challenges in the planning with regard to the use of straw as a building material?

The planning was a challenge because all those involved were building with straw for the first time. However, the building companies are very committed, courageous and open to new ideas and all of them are interested in sustainable building. The good cooperation with the fire protection engineers of Rassek & Partner was also very important for the planning success.

What were the requirements in terms of fire protection?

The building is a so-called «Special Building» («Sonderbau») according to the Bavarian building regulations, so that it has to meet the highest requirements for fire protection, for example. Compared to other countries, the fire protection requirements in Germany are generally very high - regardless of the building material straw. An essential part of our fire protection concept was the construction of the outer walls. They contain a non-combustible layer both inside and outside: clay plaster on the inside and a gypsum board on the outside. In addition, the escape and rescue routes were built of concrete and a fire alarm system with fire detectors in all rooms was installed which is directly connected to the control centre of the fire brigade.

What were the challenges in the production of the straw-insulated walls?
The entire building was assembled from 50 straw-filled walls, 25 ceilings and numerous roof elements, making it one of the largest straw-bale buildings in Germany. The carpentry company, for whom this was their first straw-insulated building, decided to pre-fabricate the construction elements in the factory hall and then to store them temporarily in a marquee set up especially for this purpose. In good weather, the wood-straw elements then had to be delivered, erected and assembled quickly and covered until the outer shell was further clad.

To what extent is straw as a building material advantageous for the thermal insulation and thermal protection of the building?
As an insulating material, straw achieves every common insulation standard. As a builder we had the ambition to reach the passive house standard with the building and we did so.

Which guidelines were used as a basis for building with straw?
Straw has been a recognized building material in Germany since 2006. How to build professionally with it is described in the straw construction guideline of the German Straw Bale Building Association (Fachverband Strohballenbau Deutschland e.V.). On this basis, the specialist companies involved were able to familiarise themselves with the topic.

What were the reactions from the building insurance companies regarding the insurance of the straw-insulated building?
None. The premium for building insurance is based on the cost of construction and not on the building materials used.

Would you recommend building with straw to other public building owners and if so, why?
We monks recommend building with wood and straw to all builders who want to protect the climate and preserve the earth's resources for future generations. This method of construction is now technically mature and has an outstanding ecological balance.

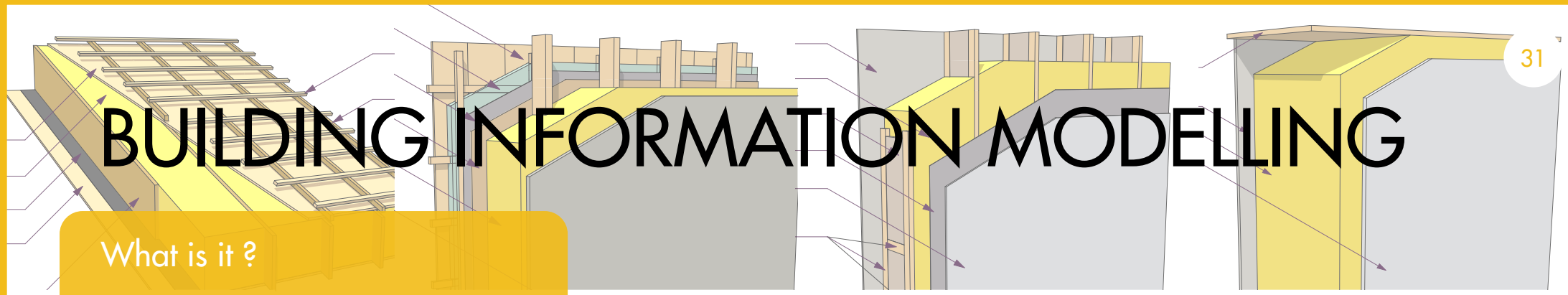
03 USEFUL RESOURCES

This chapter comprises useful resources that will help you with your reflections and approaches regarding straw building. Our aim is to help you and encourage you to change your construction methods to locally-sourced, high-quality and environmentally friendly methods.

The 5 resources that we showcase have been developed by the partners of the European Interreg Project, UP STRAW, to boost the straw building sector and remove as many obstacles as possible:

- **BIM : integration of straw.** Building Information Modelling is a collaborative building design tool. The partners of the UP STRAW project have created a library of straw walls that BIM tools can access.
- **A MOOC : Building for Change - Naturally.** Training is crucial to developing straw building. The UP STRAW partners have introduced a distance learning course in both French and English.
- **LCA : a new tool.** The UP STRAW partners developed a lifecycle analysis tool for straw walls in order to demonstrate the low environmental impact of straw and make comparisons.
- **ZOTERO : an open library.** The UP STRAW project has allowed a library of more than 400 publications on straw building to be created.
- **National Networks.** A network of professionals exist in each partner country. Your local contact point for information!

BUILDING INFORMATION MODELLING



What is it ?

The notion of a «digital mock-up» (or Building Information Modelling-(BIM)) relates to the production and management of digital information in the construction sector.

It includes parametric and structured representations with (3D models) that facilitate the exchange of digital information between participants in the same operation.

Thus, in our increasingly virtual world, managing a project «in BIM» consists of doing what was previously done on paper via digital tools.

Such tasks include : design, 2D and 3D drawing, pricing, acoustic, thermal, structural and environmental modelling, asset management, planning, deconstruction, waste management etc.

In order to develop a straw construction, 12 «typical walls» were therefore modelled in BIM as part of the UP STRAW project.

How does it work ?

Within the framework of the UP STRAW project and by the use of BIM, 12 walls representative of straw construction were designed and documented by Eco-Etudes and drawn by its partners (jö), miga, margecobim. The walls were described in 3D and commented on in French, English and Spanish, with a list of materials used and environmental and thermal performance levels estimated with the cocon-bim software.

This information was described by documents in pdf and docx format and available as «BIM files» (skp, rvt, pln format) which can be imported into software such as Archicad, ArchLine, Sketchup, Revit, etc.

All these documents can be downloaded for free on the BimObject website. These walls are thus easily usable by construction professionals in order to design and build straw buildings with contemporary digital tools.

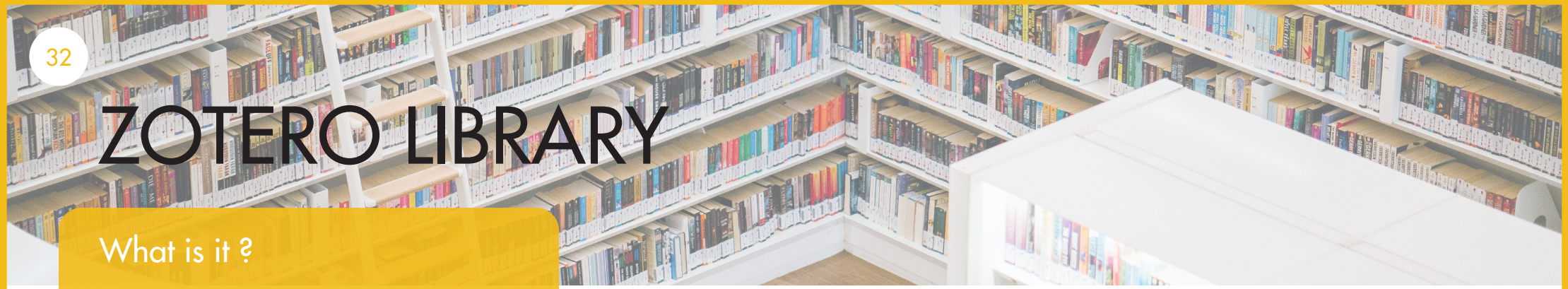
Where is it ?

These BIM objects describe 12 walls representative of main current practices:

- Straw bale infill wall with :
  - single wooden frame offset to the outside.
  - single wooden frame offset to the inside.
  - double external timber frame (GREB).
  - frame and technical void.
  - non-load-bearing, centred lightweight frame
- Straw bale filling box with :
  - LMC spinning timber frame.
  - double wooden framework.
- Load-bearing wall :
  - in small straw bales.
  - in large straw bales.
- Wooden structure roof with straw bale filling.
- Roof with straw bale filling on wooden structure.
- Flat roof with straw bale filling.

www.bimobject.com/fr/up-straw

ZOTERO LIBRARY



What is it ?

The partners of the UP STRAW project have created a library of more than 400 publications dedicated to building with straw. It is for everyone - amateurs, construction professionals, promoters, scientists or those who simply want to know more.

The publications cover all subjects associated with building with straw, i.e. regulatory aspects, construction techniques, technical and environmental performance, fire security and acoustics and scientific publications. They gather together publications from every country in the world. Most of the publications are in English.

The library is hosted on the ZOTERO platform, a free reference management tool that allows the user to manage bibliographical data and documents such as websites, videos, scientific articles, books and PDFs.

This library is always being updated. Feel free to check it regularly and let us know about documents that it doesn't include yet.

How does it work ?

The publications are classified by subject:

- Building codes - Technical assessment
- Mechanical Resistance - Stability
- Safety in case of fire
- Hygiene Health Environment
- Safety in case of fire
- Protection against noise
- Energy economy - Heat retention
- Sustainable use of renewable resources
- Hygrothermal properties
- Life Cycle Assessment
- Acoustics
- Renovation with straw
- Durability
- Loadbearing - Strength of materials
- Technical books and guides
- Non-technical information
- Feedback and Straw Model Buildings
- Fire reaction

Where is it ?

The link below only allows the user to see the titles in the library, without giving access to the content because some documents are subject to copyright. The access to the content of the library is free but you must register.

The library is laid out as follows: the folders and sub-folders are in the left-hand column, the titles, authors and publication dates are in the centre column and the information and summary for the selected item are given in the right-hand column.

The library can be accessed via a web browser but the data can also be synchronised to your computer in the same way as Dropbox or OneDrive.

www.zotero.org/groups/2187655/upstraw

MASSIVE OPEN ONLINE COURSE

What is it ?

A Massive Open Online Course is an online learning programme, also known as a MOOC.

The UP STRAW partners have written a brand new MOOC, to help you learn more about straw and natural building.

The objective of this MOOC is to increase the skills of professionals in the building sector, within the themes of natural and sustainable building. This free training course enables anyone, familiar with the world of construction, to discover or improve their knowledge of straw building techniques.

At the end of the MOOC, a general test validates the knowledge acquired and provides the learner with a certificate of achievement. This MOOC is bilingual English/French and the audience for this course is extended to all the partner countries of the UP STRAW project.

How does it work ?

By registering for the MOOC 'Building for change – Naturally' you will find 6 sequences, each comprising 3 to 4 modules:

Sequence 1: Inspirations and origins
1. Diversity of straw construction
2. Why build with straw
3. Perspectives and development

Sequence 2: Straw as a building material
1. The qualities of straw
2. What is a Construction Bale and where to source them
3. Everything you wanted to ask about building with straw

Sequence 3: Construction methods
1. Infill
2. Prefabrication
3. Load bearing
4. HVAC systems

Sequence 4: Building physics
1. Heat transfer
2. Moisture transfer and buffer effect
3. Thermal mass
4. Acoustics

Sequence 5: Finishes
1. Earth plaster
2. Lime plaster
3. Cladding

Sequence 6: Project management
1. Organisation
2. Planning
3. Cost estimation
4. Risk management

Where is it ?

It is intended that the MOOC 'Building for change – Naturally' will be made available to learners at various points throughout the year. It lasts 6 weeks and learners can join at different times during the course.

www.mooc-batiment-durable.fr/

>>> Go to 'Building for Change – Naturally'.

LIFE CYCLE ANALYSIS

What is Life Cycle Assessment ?

In construction, each element of a building has an environmental impact. To quantify this impact and address its effects, the Life Cycle Assessment (LCA) method is used. It is an internationally standardized method.

LCA is a cradle-to-grave environmental approach which provides an overview of the environmental emissions and resources consumed by a product or process during its lifecycle. Therefore the environmental performance of a building is directly impacted by the nature of the construction products used. An LCA may identify and quantify the potential impact of a product and, it can also identify the potential relocation of impact from one media to another, and/or from one life-cycle- stage to another. LCA studies help to avoid environmental problems, often called "shifting of burdens", where the impact at one point in the lifecycle is reduced, only to be increased at another point.

How does it work ?

Straw is a natural product -with beneficial properties- that make it an alternative for more commonly used insulation materials such as rock wool or EPS. The LCA makes it possible to see in detail what all the impacts at all stages of the straw bale value chain might be. For the UP STRAW project this means that different types of straw and different types of construction techniques are being compared. Straw bales from different countries are compared to each other; are there any differences in the production process per country that result in a higher or lower environmental impact? Straw bales are used for twelve construction techniques, which are also compared to each other in order to establish which kind of construction technique has a better environmental impact. The techniques all have a different process but are commonly used throughout Europe.

Where is it ?

Several tools can be used to calculate the environmental performance of a building or product.

NIBE will write a report on the environmental performance of building with straw compared to using more traditional building materials. This report is expected at the end of 2020.

Additionally, NIBE will support each country which would like to have an Environmental Product Declaration (EPD) of their straw -LCA in the national or European database. This process involves an external review and allows the EPD to be used in tenders, BREEAM-calculations or other impact assessments. The central European database for EPDs' is the EcoPlatform-database: https://www.eco-platform.org/.

Additionally, most countries have their own specific environmental database as well.

NATIONAL NETWORKS

What is it ?

There is a strong network of straw bale construction - nationally and internationally. In many European countries construction experts and those interested in sustainable building with straw are organised in national associations.

In Belgium, Germany, France, the Netherlands and the United Kingdom these associations offer information to their members as well as to the public and drive forward market development for straw bale construction. The purpose of these networks is to recognise and promote the use of straw in construction in their country. They also invest in research and development and aim to professionalise the sector.

In addition to the national networks, the European Straw Building Association (ESBA) was founded to cooperate, exchange and communicate in the topic of straw building in Europe.

How does it work ?

Are you working on a construction project using straw? Do you have questions about straw bale building? Contact your national network! On their websites you will find professional publications, building guidelines, examples of straw buildings, events related to straw construction as well as educational opportunities. In addition, you will find contact data of straw construction experts in your region who will be happy to advise you on your building project.

Where is it ?

Europe
European Straw Building Association (ESBA)
www.strawbuilding.eu

New European Strawbale House Register with more than 1200 buildings on a map:
www.strawbuilding.eu/strawbale-houses-europe

France
Réseau Français de la Construction Paille (RFCP)
www.rfcp.fr

The United Kingdom
Strawbale Building United Kingdom (SBUK)
www.strawbalebuildinguk.com

The Netherlands
Vereniging Strobouw Nederland (SBN)
www.strobouw.nl

Germany
Fachverband Strohballenbau Deutschland (FASBA)
www.fasba.de

Belgium
Réseau Belge francophone de la Construction Paille (RBfCP) www.rbfcp.be

04 UP STRAW PROJECT

5 countries and 7 partners are involved in the UP STRAW project, convinced that the construction sector has to bring about a paradigm shift by adopting sustainable ways of building.

UP STRAW is an Interreg-North West Europe (NWE) funded programme (2017-2021) in which French, Belgian, Dutch, British and German partners cooperate. It funded for 60% by Interreg NWE, with a total project budget of € 6,4 million (EU funding: € 3,8 million).

The aim of the project is to position straw as a premium bio-based building material, positively affecting healthy buildings, reducing greenhouse gas emissions and environmental impact.

The project also stimulates and facilitates the application of straw in Urban and Public buildings by undertaking research, education and knowledge, market development and communication.

In addition to these activities, five pilot sites demonstrate different straw construction techniques with buildings built or renovated with straw : in Hastings (UK), construction of The Country Park Visitor Centre built using load bearing technique, in Tilburg (NL), restoration of the Roomley Sports Hall, insulated with « blown in straw » panels, in Namur (BE), construction of the new office of the Cluster Eco Construction with straw panels, in Plankstetten (DE), construction of a new building at the Plankstetten Abbey built with straw panels, and in Montargis (FR) renovation and construction of the straw bale building education centre at the Maison Feuillette site.

The Interreg North-West Europe Programme fosters transnational cooperation to make Northwestern Europe a key economic player and an attractive place to work and live, with high levels of innovation, sustainability and cohesion.

All UP STRAW partners have contributed to these goals !

CITIZENS' SUMMARY

Annual Implementation Report

2019

Innovation

€ 109.6M allocated

38 projects approved

Low carbon

€ 164.3M allocated

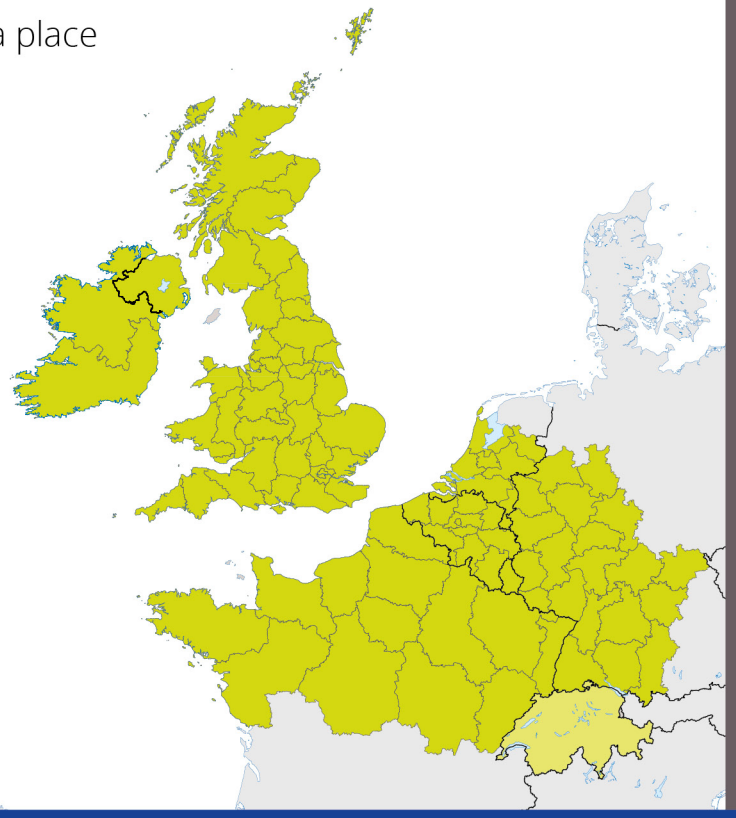
35 projects approved

Resource and materials efficiency

€ 77.6M allocated

22 projects approved

Since 2014, the Interreg North-West Europe Programme supports **outstanding ideas that have already made a difference for local communities throughout the area.** This part of Europe is a place of great economic performance and growth in major cities. Yet, surprising discrepancies still exist. Our role is to **reduce these differences by supporting cooperation** across the borders of eight European countries and tackle common challenges in the area.



95 APPROVED PROJECTS

€ 351.5M ERDF ALLOCATED

983 PARTNERS

EXPECTED RESULTS

12,639 households with improved energy class

3,080 citizens benefiting from social innovation

3,397 businesses supported

871 jobs created

45.23 mega watts of additional renewable energy capacity

05 PARTNERS CONTACT SHEET

LEAD PARTNER ORGANISATION

FRANCE

CNCP-Feuillette

Stéphanie Ventre

@ stephanie.ventre@cncp-feuillette.fr

www.cncp-feuillette.fr

FRENCH SUB PARTNERS

Odeys

ACCORT-Paille

ARPE Normandie

ECHOBAT

RFCP

PARTNERS

BELGIUM

Cluster Eco-construction

Hugues Delcourt

@ hd@ecoconstruction.be

www.ecoconstruction.be

GERMANY

Benediktinerabtei Plankstetten

Benedikt Kaesberg

@ info@bau-mit-stroh.de

www.bau-mit-stroh.de

NETHERLANDS

Municipality of Tilburg

Maikell van Rooijen

@ maikell.van.rooijen@tilburg.nl

www.tilburg.nl

Strobouw Nederland

Wouter Klijn

@ wouter@strobouw.nl

www.strobouw.nl

UNITED KINGDOM

The School of Natural Building

Eileen Sutherland

@ eileen@schoolofnaturalbuilding.co.uk

www.schoolofnaturalbuilding.co.uk

Hastings Borough Council

Murray Davidson

@ mdavidson@hastings.gov.uk

www.hastings.gov.uk

06 COLOPHON

Issued by:
NWE Interreg UP STRAW | January 2021

Contributions by:
Carole de Fays
Fabienne Pasquier
Luc Floissac
Joost van Leeuwen
Hugues Delcourt
Nicolas Rabuel
Wiebke Kaesberg
Allan Sutherland
Wouter Klijn
Brother Andreas Schmidt, OSB
Stéphanie Ventre

Layout/editing:
David Delangh

Proofreading:
Allan Sutherland

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p 12-13	Cluster Eco-construction
p 14 - 17	Wouter Klijn
p 18 - 20	Indiana Hamilton-Brown - Green & Castle Ltd and #Constrawtium
p 22 - 25	CNCP
p 26 - 29	Lorenz Märtl - Wiebke Kaesberg - Lorenz Märtl - Lorenz Märtl
p 30	/
p 31	Co-Etudes, (jö), MARG'ECO BIM, Miga arquitectura
p 34	Dauphins architecture
p 38	Cluster Eco-constrution

Interreg
EUROPEAN UNION
North-West Europe
UP STRAW
European Regional Development Fund

UP STRAW

YEARBOOK 2020

SUPPORTING THE USE OF STRAW IN URBAN AND PUBLIC BUILDINGS

Interreg North-West Europe
UP STRAW
European Regional Development Fund

UP STRAW