

ÉCOLE POLYTECHNIQUE DE LOUVAIN  
FACULTÉ DE L'UNIVERSITÉ CATHOLIQUE DE LOUVAIN

LEPL2211 - INTRODUCTION TO BUSINESS ISSUES

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## Executive summary : Isohemp

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## Introduction

In the framework of the course LEPL2211: Introduction to Business Issues, we decided to analyse the company Isohemp, an industrial manufacturer of sustainable products for the construction and renovation sector. Isohemp is a leading manufacturer of sustainable products for the construction and renovation sector, offering its customers durable, high-performance insulating envelope solutions for all new construction and renovation projects.

Founded in 2011 by Olivier Beghin and Jean-Baptiste de Mahieu, engineers by training, working mainly on the design of a range of products made from lime and hemp. Today, after many important investments, Isohemp employs about twenty people and is expanding throughout Belgium and abroad.

### 1 What were the triggers of the launch of this business? Which were the key steps and the key stakeholders involved in that process?

#### 1.1 What are the main motivations behind this business ?

For a long time, the techniques for using hemp concrete in the building industry remained artisanal: either by mixing the components on site and applying them in formwork, or by using a spraying machine requiring highly skilled labour. IsoHemp's response to these difficulties was to launch a product that could be used by all professionals. IsoHemp thus offers a global and efficient solution for sustainable insulation.

As Olivier said : *"The development of this company comes from a real desire to make things happen, to create jobs and to develop a project on an industrial scale, which is a real passion for us."* In developing the industrial production chain, IsoHemp wanted to respect its values (**Expertise, Reliability, Ecology, Proximity and Healthy housing**) through 3 fundamental development axes : **the short circuit, natural raw materials and an environmentally friendly factory.**

#### 1.2 What were the opportunities and sources of inspiration ?

The opportunity to enter a growing market was a godsend for the founders of Isohemp, conscious of the desire and need to make things happen and convinced that *"The addition of the small initiatives of each person, in their daily life, will make things happen and this is what gives me confidence in the future."* This change of mentality that pushes us to act differently than we would have done in the past. With the hope that by changing things from below, the whole

business world, politics etc.

As the company was created and developed, investments had to be made, in particular with the support of the Walloon region through various aids, whether for the development of products or the installation of the factory.

The key dates in the development of Isohemp are listed below:

- **2011** : Foundation of Isohemp and development of a range of products made of lime and hemp
- **2013** : The transition from a small-scale production phase to industrial production, with large production capacities equivalent to the construction of several houses per day.
- **2014** : Investment of more than one million euros made to inaugurate a new industrial production plant in the Namur region.
- **2019** : 5 million investment to expand its production site and boost its production tool.

### 1.3 What are the resources and what is the value created ?

The objectives, in addition to creating materials to build houses, are to be consistent with a low environmental impact culture, to be at the forefront of technology and to be part of a sustainable development logic.

The raw materials (hemp (80%), lime and water) are 100% natural products with a low environmental impact. In addition, in order to minimise the transport footprint, the company mainly uses local suppliers. Hemp requires no pesticides and very little fertiliser, each hectare of this plant stores up to 3 tons of carbon dioxide. The objectives of low consumption and sustainable development are justified by the following points:

- The factory is **fully automated**.
- **No chemicals are used**: the blocks are made entirely of natural, local and ecological products.
- The entire site consumes the **energy equivalent of only 10 washing machines**.
- All production waste/bus is recyclable and can be re-injected into the manufacturing process, **so virtually no waste is emitted**.
- A **cleaning water recovery and recycling system** is in place, ensuring that not a single drop is discharged into the sewer.

From a more technical point of view, hemp blocks are used by professionals for both new constructions and renovations. It is used for the construction of envelopes, partition walls and insulating partitions. Due to its water vapour permeability and moisture buffering properties, it is also used as interior insulation for old walls.

## 2 What are the target needs and the key competitors/alternatives vs those needs? What are the key sources of competitive advantages?

The firm responds to two principal needs, the use of sustainable products for construction and renovation. The proposed products include: hempcrete blocks and PCS Interior Coating made from natural plaster, lime and sand. The strength of Isohemp is the sustainability of their products, so for the competitors and the alternatives let's focus on the sustainable ones.

### 2.1 Competitors and alternatives

There are a few firms producing sustainable building materials :

- **Ecomat** is a Belgian enterprise using timber frame for construction and they offer "insulation by insuflation" that consists of pressurizing wood or cellulose fibres in a closed box, such as floors, walls, crawlers and roofs. Plus, they propose too hempbased products.
- **Isoproc** is a Belgian firm too, in their case they have products made from cellulose for insulation
- **Recticel** is a Belgian company that offers a range of products for thermal and acoustic insulation, such as polyurethane foam and rock wool insulation panels
- **Wienerberger** is a Belgian company specialized in the production of clay bricks and tiles for construction. It also offers a range of thermal insulation products, such as insulating bricks and expanded clay insulation boards.

### 2.2 Sources of competitive advantages

Let's analyse what could be the sources of competitive advantages of Isohemp. First, their hempblocks reunite many advantages in one brick, among the biosourced insulations. Their 100 percent natural solution, derived from local channels, offers a very positive carbon balance. But above all, it offers excellent thermal regulation (its strong inertia guarantees comfort in all seasons) and water regulation (this buffer ensures a healthy and constant indoor climate), as well as good sound insulation (it naturally reduces external and ambient noise) and a nice reaction

to fire (it resists up to more than 2 hours, depending on the finishes and the thickness of the block used). Plus, they use what they call the hempro system, that consists in two types of hemp blocks of 30 or 36cm thick: solid blocks and machined blocks (drilled blocks and U-blocks). Arranged in the housing envelope, the machined blocks will serve as lost casing insulating the structural structure of reinforced concrete that will be poured there. The drilled blocks will serve as formwork for the posts and the U-blocks will allow the beams to be cast on which the beams and the roof will be installed. Finally as the implementation of a new construction with the Hempro system is very fast, the performance/price ratio is excellent.

## **2.3 SWOT analysis**

The SWOT analysis, which stands for Strengths, Weaknesses, Opportunities, and Threats, is a tool that businesses use to condense their strengths and weaknesses and view them in the context of the opportunities and threats present in their environment. This approach evaluates the favorable and unfavorable aspects of both the company's internal factors (its strengths and weaknesses) and external factors (opportunities and threats).

### **2.3.1 Strengths**

IsoHemp is a Belgian firm that specializes in the production of high-quality, sustainable hemp construction materials. The company's strengths include competence in hemp-based construction materials, a diverse product line, and an active presence in Belgian and European markets. The company's commitment to sustainability and the environment is also a fundamental strength, helping to position it as a leader in the market for sustainable building materials. Plus, their commitment give them a good brand image.

### **2.3.2 Weaknesses**

Hempcrete is a relatively new material, it induces a not aware market that could limit problem for the growth potential of the firm. Plus, because it's somewhat new, it could be difficult to educate potential customers about the benefits of the material. Finally, the manufacturing of hempcrete can be complex, for that reason it could increase production cost and limit scalability.

### **2.3.3 Opportunities**

Despite these obstacles, IsoHemp has a number of opportunities to grow and expand its business. One significant opportunity is the growing demand for environmentally friendly and sustainable building materials. As consumers become more aware of the environmental impact of their purchasing decisions, there is likely to be an increase in demand for materials such as those produced by IsoHemp. To meet this growing demand, the company has the opportunity to expand its product line. Furthermore, Isohemp has already established a presence in other

European countries, demonstrating the interest of other countries and the possibility of exporting their products. They could also explore partnerships to increase market reach and drive sales.

### 2.3.4 Threats

However, there are also threats that IsoHemp must be aware of. The sustainable building materials market is becoming increasingly competitive, and the company will need to work hard to maintain its position as a leader in the industry. Raw material and manufacturing cost fluctuations may also have an influence on the company's profitability. Finally, changing environmental legislation may provide new hurdles for IsoHemp and other firms in the market for sustainable construction materials.

## 3 What is the main product/market positioning of the firm? How does it differs from its main competitors/alternatives?

Finding out about the product/market positioning of the company can be done with the four P model.

The four P model is primarily used as a framework for developing effective marketing strategies by businesses. By analyzing each of the four components (product, price, place, and promotion) (2), businesses can gain a better understanding of their target market.

Businesses use product/market mapping to identify new opportunities for growth and development.

### 3.1 The Products

IsoHemp is an environmentally conscious company that specializes in providing sound and heat insulation solutions for both new and old buildings. Their flagship product, the hemp block, is a masonry product that is ideal for partition walls, and counter-partitions. This product is highly valued by professionals for applicability in various construction projects.

Customers have the option of purchasing the hemp blocks individually or in pallets, depending on their needs. This makes it easy for clients who require large quantities for constructing bigger walls, as well as those who only need a few blocks for smaller renovation projects.

One of the key advantages of IsoHemp's hemp blocks is that they can be used to construct walls without requiring any additional structural elements. This distinguishes them from other insulation manufacturers who rely on such elements. Additionally, the blocks are made from natural materials, which makes them eco-friendly. Different sizes of blocks are available to meet



varying thickness and insulation requirements, and their packaging ensures ease of transportation for customers.

### 3.1.1 Competitors

There are alternatives to the hempblocks, however they do not always offer the same unique characteristics. Many of the insulation options on the market today were not specifically designed to be used as walls, but rather as a part of a larger structure. For example, insulation panels or fiberglass often require additional structures around them to create a full wall.

As consumers become more conscious of their material choices, the demand for eco-friendly and sustainable products like hempblocks will continue to grow.

## 3.2 The Prices

When considering the price of a product, it's important to weigh the benefits it provides. In the case of insulation products like hempblocks, the cost of the product can be reduced by the savings it provides in terms of energy efficiency and reduced heating and cooling costs.

Customers who prioritize having a well-insulated home may be willing to pay more for a higher quality product, even if it initially costs more than other options. By choosing a better insulating product like hempblocks, they can save money in the long run.

While the initial cost may be higher than other insulation options, the long-term benefits of using a sustainable and eco-friendly product like hempblocks make it a worthwhile investment for many customers.

The prices proposed by IsoHemp (shown below) (12) can seem to be high compared to other isolation methods. However, several factors have to be taken such as the sustainability.

Thickness	Price/m <sup>2</sup>	Thermal resistance
90mm	40€	1.34 [m <sup>2</sup> /KW]
120mm	54€	1.79 [m <sup>2</sup> /KW]
200mm	83€	3 [m <sup>2</sup> /KW]

This range of isolating materials allows customers to make an informed decision that is tailored to their specific requirements.

When comparing to competitors with similar thermal isolation abilities, IsoHemp's prices are much higher per m<sup>2</sup>.

It is important to note that, in this list, the other products, require additional structural support to create a wall. When considering the cost of the entire wall, the price difference between IsoHemp's products and their competitors becomes less significant.

Competitors	Price/m <sup>2</sup>	Thermal resistance
Hempblock 200mm(12)	83€	3 [m <sup>2</sup> /KW]
"Biofib'Trio 120mm" (12)	17.80€	3.15[m <sup>2</sup> /KW]
"Rockwool 125mm"(10)	30€	3.7 [m <sup>2</sup> /KW]
"Panneau rigide Pavatherm 120mm"(12)	32.41€	3.15 [m <sup>2</sup> /KW]

IsoHemp's prices for their hempblocks are much higher than the prices for traditional insulation materials. This is partially due to the fact that IsoHemp is not a multinational company and also because of the organic nature of their product.

However, for many customers, the eco-friendliness is a major factor in their decision to choose this product for building or renovating their home. With increasing awareness of the environmental impact of construction materials, many people are seeking out sustainable options.

### 3.3 The Place

As a construction material, Hempblocks can be found in a wide variety of material distributors, just like most other construction materials.

Customers can buy the products online, mainly from construction equipment websites. The quantities and logistics are usually too large to pick up the material in the store, so the blocks are delivered to the construction site.

You can also buy the blocks on websites specialized in ecofriendly building materials. The factory itself is in Belgium, which is relevant to the promotion of the product which wants to be local and have the lowest carbon footprint as possible.

### 3.4 The Promotion

The company's promotion efforts are targeted towards two distinct groups: individuals who are looking to renovate their own homes, and builders and architects who are hired by clients. These efforts are primarily focused on the construction industry and are executed through a variety of channels such as media advertising, social media.

In order to expand their customer base, IsoHemp are present on promotional stands at events like "Batibouw" and "Bois et Habitat", where professionals from all over the country come together. These events are opportunities to inform the public about their products and services while also engaging with potential customers.

In addition to its marketing efforts, IsoHemp is promoting eco-friendly construction practices and is registered on several websites that provide tips on reducing carbon footprints while building a home.

IsoHemp also offers helpful tips and training to professionals who are looking to construct and

sell their products.

To expand its customer base, IsoHemp has created a panel of tutorials on its social media platforms to encourage non-professional builders to renovate their homes themselves.

All of these promoting methods are aimed to show the best abilities of their product to both types of clients, including the environmental impact, thermal regulation, sound isolation, and humidity regulation.

By focusing on sustainability and providing resources and information to both professionals and non-professionals, IsoHemp is able to differentiate itself from competitors and attract more customers who are interested in eco-friendly construction.

## 4 What is the value chain positioning of the firm? Who are the key suppliers and customers?

### 4.1 Value chain positioning

First step of the value chain, the *design* of the offer. In order to create value for the customers, the company is constantly working, researching and experimenting such that their products respect as much as possible the typical requirements for a building material: insulating, fire resistant, acoustic isolation and waterproof. Moreover, IsoHemp develops a 100% natural material with low carbon footprint (the hemp cultivation requires no pesticides and very little fertilizer). Also, regarding the construction aspect, hemp blocks are thought to have a flexible design, a long-term sustainability, an ease of implementation and a wide choice of finishing: brick, roughcast, cladding... This offer is compelling regarding what already exists for raw materials in construction (often not natural and pollutant, not very flexible and not always well isolated).

The *operations* performed to obtain the final product are divided in 3 steps:

1. Supplies: hemp, lime and water. More details in section 4.2.
2. Production: hemp and lime are mixed together with water, moulded in a block and pressed. Then, stocked on pallets and open-air dried for 6 to 10 weeks.
3. Delivery: IsoHemp doesn't sell their products directly to customers but they work with a network of distributors who have their products in stock.

The cost of the operations are low, they need to buy the raw materials but the production requires almost no money or energy as the drying is made naturally. The network of distributors allows for an efficient and wide spread delivery.

To ensure to satisfy and help *clients* in the handle of the product, IsoHemp has designed diverser and various services and strategies. First, they propose a rental service of the equipments

needed for constructions with their building blocks. Plus, they organize training course on implementing hemp blocks and offer the possibility to customers to have experts on their building site. There is an FAQ and an exhaustive technical documentation on their website with specifications, technical data sheet, installation guide, product sheet and brochure. Finally, they also have a youtube channel with tutorials on how to start an Isohemp hemp block masonry.

## **4.2 Key suppliers**

The key suppliers are for the raw materials needed: hemp and lime. Hemp comes principally from hemp farmers and lime from lime producers. To stay in harmony with their ecological vision, the firm maximizes the short route and have different suppliers in Belgium and neighbouring countries like France and the Netherlands.

## **4.3 Key customers**

The key customers of IsoHemp can be from various horizons. It meets the demands of clients with a certain wealth, looking for modern and natural housing and a will of being eco-responsible in their life choices. Any building project can be made whether it is residential, real estate development, renovation, extension or social housing.

# **5 What are the key elements of the organization and governance of the firm? Which are the key partners and support mechanisms involved?**

## **5.1 Organization and governance**

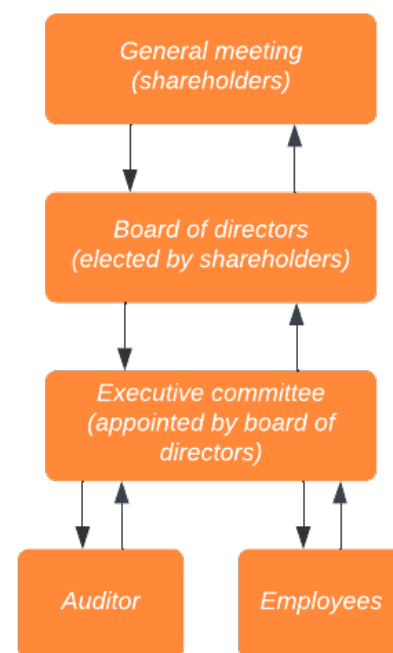
IsoHemp was founded by a civil engineer and a management engineer who joined forces in a business creation project at UCLouvain. They both have a passion for construction, the ambition to have a positive impact on the environment and their entrepreneurial spirit. And for these same reasons, a third engineer quickly joined them in this venture. They were convinced that all their ambitions lay in a promising but too little-known plant : hemp.

As engineers they have the required technical skills, leadership capabilities and thanks to the people they met at university and more specifically a researcher working in the same field, they had a network and could gather knowledge of the environment in which they will have to operate. All these features are fundamental in an entrepreneurial project as they reflect the quality of the team, which is the most important part for the achievement of success.

After 12 years, the company has grown considerably and has thousands of new constructions and renovations in its portfolio.

In terms of organizational structure, the company follows the classic structure of a Belgian public limited company (SA) which is made of :

- **General meeting :** The general meeting is the supreme decision-making body of the SA and meets at least once a year. Shareholders have the right to vote at the general meeting and can make important decisions such as the election of directors, the distribution of dividends, and the approval of annual accounts.
- **Board of directors :** The board of directors is the governing body of the SA and is elected by the shareholders at the annual general meeting. The board of directors is responsible for the general management of the company and making some operational decisions. The shareholders of IsoHemp elected 7 people as board of directors during their last general meeting.
- **Executive committee :** The executive committee is appointed by the board of directors and is responsible for the day-to-day management of the company as well as corporate strategy. It is composed of 3 people for the Walloon and Brussels regions, 1 person for Flanders and 2 other people for France.
- **Employees :** The company hires employees to perform various functions such as administration, production, marketing and sales. IsoHemp counts about 30 employees.
- **Auditors :** Auditors are appointed by the shareholders to check the annual accounts and report to the annual general meeting. IsoHemp nominated “Cabinet Bruno Vandenbosch & Co” as their auditor in 2020.



Corporate structure of IsoHemp

## 5.2 Innovation support mechanisms

The innovation support mechanisms involved are the search for social entrepreneurs and labels. Indeed, IsoHemp is continuously looking for entrepreneurs that have an innovative project with an environmental impact. It also has labels as they are recognized by the FEDER (“Le Fonds Européen De Développement Régional”), the UBAtc (“Union Belge pour l’Agrément Technique dans la Construction”), the Solar Impulse Foundation, VIBE (“Regenerative design and construction is the future.”) and Wallonia Clusters.

Furthermore, they collaborate with architects, individuals, contractors, distributors, and entrepreneurs concerned about their ecological footprint and wanting to provide a high-performance solution to their clients' or their own insulation problems.

They also make partnerships with more formal structures such as the European commission which chose IsoHemp for a renovation project for a former electrical central in Belgium.

Thanks to these partners and accomplishment, they expanded gradually, starting in Wallonia, they got to Flanders, then to France and they are now active in 5 countries in total with more than 80 specialized resellers.

## 6 What are the key elements of the financial structure of the firm? What are its prospects and main sources of funding?

### 6.1 IsoHemp's financial statement

As a first impression to IsoHemp's financial structure, the financial statement (6)(7) allows to make two observations :

1. Since its creation, IsoHemp has consistently invested more than it has earned in profits. As a result, the company has maintained a continuous level of indebtedness and a negative overall financial position.<sup>[1]</sup> While these figures might typically indicate an unhealthy financial situation, it's important to note that for a young start-up like IsoHemp, this actually demonstrates the company's commitment to investing heavily in research and development, building infrastructure, and driving growth within the organization. The company's strategy is to prioritize long-term investments that will fuel sustainable growth over time, rather than focusing on short-term profits. This approach allows IsoHemp to maintain its competitive edge in the market and continue to innovate its product offerings. However, we can see since 2021 a change in this trend, indicating a certain maturity of the company which should in the coming years continue to generate more profit than losses and finally reach cumulated financial balance.
2. The company has opted for a combination of equity financing and debt financing to strike a balance between the two according to their stage of development. Like many startups, in their initial years (up to 2019), they relied heavily on equity funding, with almost half of their financing coming from equity sources. As they became more established, they shifted towards a greater reliance on debt financing to meet their funding needs. This change

in strategy coincided with a major investment in a new facility that required significant capital investment of 5 million euros.(5)

The company's financial approach reflects its cautious and pragmatic approach to funding, balancing the need for capital to fuel growth and investment in new infrastructure with the desire to avoid over-reliance on either equity or debt financing. This strategy has allowed the company to maintain flexibility in its funding approach, ensuring that it has the resources it needs to continue to innovate and expand, while also minimizing the financial risk associated with too much debt or too little equity.

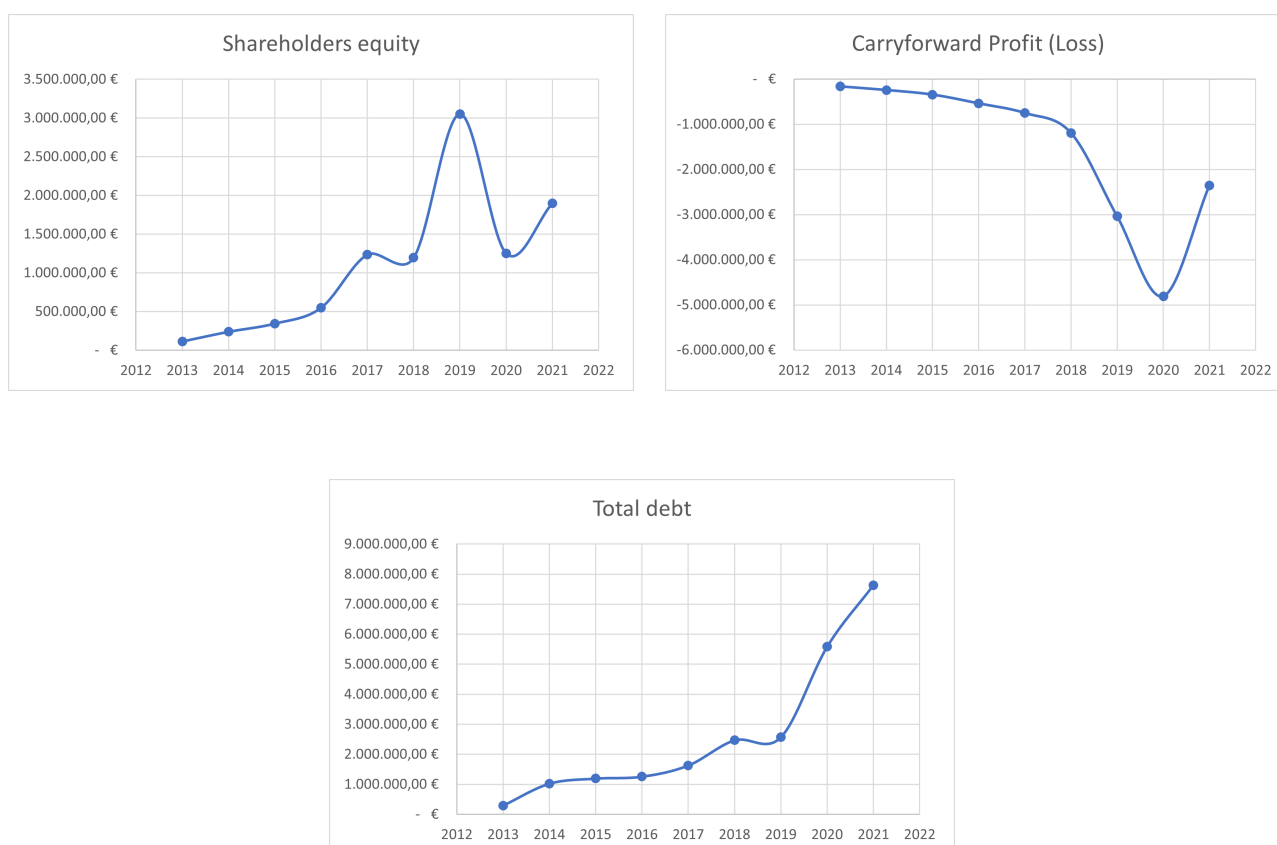


Figure 1: Financial report analysis of IsoHemp

## 6.2 Subsidies

In 2019, the EU and Wallonia have subsidized a joint research project between IsoHemp and Desimone (Industry and Development) in the amount of 1.8 million euros as part of the European Regional Development Fund (ERDF) program. The EU financed 40% of the total subsidies. This project aims at translating the technology and standards of the concrete industry to the industrial production of bio-based blocks and deploying it on a global scale. (8)

### 6.3 Buisness model & repartition of revenues

IsoHemp is a company that has been experiencing rapid growth in recent years, with its revenue doubling each year. As a result, the company is looking to meet the increasing international demand for its product, which currently accounts for 40% of its sales.(5)

IsoHemp's project is aligned with the context of sustainability, which is becoming more and more important in the building sector. By offering products that help reduce CO2 emissions, such as biosourced blocks, IsoHemp is able to position itself as an environmentally responsible company. Additionally, the company is focused on using short circuits, meaning they prioritize local sourcing to reduce their environmental footprint and support local economies.

IsoHemp's revenue is primarily generated from renovation projects (75%) and new construction (25%).(5) This emphasis on renovation demonstrates the company's commitment to reducing waste and promoting a circular economy by repurposing existing buildings. By using their biosourced blocks in renovations, IsoHemp is able to offer an eco-friendly alternative to traditional building materials.

## 7 What are the main ethical and/or sustainability challenges faced by the firm? How is it dealing with those challenges?

### 7.1 Theory behind the business ethics

As César Vieira Cervera refers in "Código de Ética"(19), the social responsibility of the firm, is a way of management based in the ethical relationships with partners and in the establishment of business goal that preserves the sustainable development of the society. This means that the main challenges of a firm are achieving their own goals while preserving natural resources, encouraging the culture, the diversity, and promoting the reduction of the social inequalities.

Edward Freeman, a famous North American philosopher, is the father of the Theory of the Stakeholders. This term refers to those people or entities that have been affected positively or negatively by the activity of the firm. Then, we can conclude that a firm that performs with social responsibility is a firm that take care of their workers, respect their rights, is aware of the environmental care and their goals benefit the society, among other things.

Focusing in Isohemp, as we have previously mentioned in other sections, it relies solely on natural resources for the construction of hempcrete blocks. The key behind this huge project is not only the resources from which they build the blocks, but also the techniques and procedures



they use to construct them, and their restricted partnerships. Actually, IsoHemp wanted to stand true to its values with three fundamental development factors: short distances, natural raw materials and an environmentally friendly factory.

## **7.2 Minimization of energy consumption**

In the case of IsoHemp, the company has stated that their production process is energy-efficient and uses a low amount of energy. They use natural resources like water and sun to grow their hemp plants, and their production process does not involve high-temperature processes or the use of synthetic chemicals, what leads the company to a high compromise with the reduction of energy consume. Actually, the factory where they build these blocks only consumes the amount of energy needed to power ten washing machines, which is a surprising fact compared to other similar firms in the construction field.

## **7.3 Enviromental care**

All the processes involved in the construction of these blocks are completely natural. This is because the main idea behind these innovative blocks is to be a green, natural and eco-friendly enterprise that minimizes harm to the planet, and utilizes as many natural resources as possible. IsoHemp has implemented sustainable farming practices such as the use of organic fertilizers and crop rotation to reduce the environmental impact of the large amount of hemp needed. Additionally, they use solar panels to reduce their carbon footprint. Moreover, their processes do not involve chemical substances, and they have implemented a recovery and recycling system for waste water. These factors have earned IsoHemp the recognition of the famous foundation, Solar Impulse, which praise the environmental involvement of the firm.

## **7.4 Social compromise**

In terms of social responsibility, IsoHemp has developed a wide network of local companies, suppliers, and partners, requiring them to adhere to ethical labor practices and environmental standards. Using local suppliers allows them to reduce the transport footprint. They also state that their partners and suppliers are severely attentive to their energy consume.

In conclusion, IsoHemp faces several sustainability challenges, and their main philosophy to address them is a green mentality during all the construction processes of the hemp-based material and strict guidelines for its suppliers and partners. These factors have earned IsoHemp the title of "sustainability and ethical responsibility".

## Appendices

### Appendix A : Technical Datasheet



**Bloc de chanvre**  
Bloc 20 – Épaisseur 20 cm



**PAL20EX**

**Bloc 20 – Épaisseur 20 cm**

#### Caractéristiques techniques

	Valeur	Unité	Norme
Épaisseur	20	cm	
Dimensions modulaires	60 x 30	cm	
Nombre de blocs par m <sup>2</sup>	5,5	blocs/m <sup>2</sup>	
Poids maximum d'un bloc	16,5	kg	
Masse volumique apparente sèche	340	kg/m <sup>3</sup>	EN 772-13
Consommation de colle	7,8	kg/m <sup>2</sup>	
Résistance thermique sèche	3	m <sup>2</sup> K/W	EN 12667
Résistance thermique à 50% HR	2,82	m <sup>2</sup> K/W	EN 12667
Conductivité thermique $\lambda$	0,071	W/mK	EN 12667
Déphasage	13,1	h	ISO 13786
Indice d'affaiblissement acoustique*	40 (-1 ; 5)	dB	ISO 10140-2
Coefficient d'absorption acoustique $\alpha$	0,85		EN ISO 354 : 2003
Épaisseur équivalente de diffusion Sd	0,56	m	EN ISO 12572
Facteur de résistance à la vapeur d'eau $\mu$	2,8		EN ISO 12572
Résistance à la compression	0,22	MPa	EN 772-1
Réaction au feu	B, s1, d0		NF EN 13501-1
Résistance au feu avec enduit	EI 120	min	EN 1364-1

\* Bloc enduit 15mm sur une face – Valeur simulée

#### Avantages

- Confort d'été et confort d'hiver
- Déphasage thermique important
- Mise en oeuvre facile et rapide
- Durabilité de l'isolant et de ses performances

#### Applications

-  Isolation intérieure
-  Isolation extérieure
-  Murs intérieurs
-  Nouvelles constructions
-  Sol & toiture

#### Conditionnement

	Valeur	Unité
Dimensions d'une palette	120 x 100 x 114	cm
Poids maximum d'une palette	521	kg
Nombre de blocs par palette	30	blocs/palette
Nombre de m <sup>2</sup> par palette	5,4	m <sup>2</sup> /palette
Nombre de blocs par m <sup>2</sup>	5,5	blocs/m <sup>2</sup>
Stockage	3	mois/extérieur
Conservation	2	ans si couverte



NATURAL BUILDING

Figure 2: An example of technical sheet about the product

## Appendix B : Financial report

Donnée	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Capitaux propres</b>									
Capital	113.925,00 €	239.603,00 €	344.846,00 €	549.975,00 €	1.236.724,00 €	1.195.141,00 €	3.052.922,00 €	1.251.450,00 €	1.899.565,00 €
Bénéfice (Perte) reporté(e)	275.000,00 €	480.296,00 €	686.888,00 €	1.086.983,00 €	1.987.056,00 €	2.387.119,00 €	4.587.135,00 €	4.587.135,00 €	2.528.067,00 €
Dettes	-161.075,00 €	-240.693,00 €	-342.042,00 €	-537.010,00 €	-750.332,00 €	-1.191.977,00 €	-3.037.400,00 €	-4.809.585,00 €	-2.354.606,00 €
Dettes à plus d'un an	295.827,00 €	1.025.238,00 €	1.194.929,00 €	1.257.715,00 €	1.630.662,00 €	2.468.878,00 €	2.569.896,00 €	5.581.983,00 €	7.634.330,00 €
Dettes à un an au plus	252.048,00 €	815.312,00 €	928.383,00 €	1.050.993,00 €	1.221.445,00 €	1.541.174,00 €	1.526.704,00 €	4.329.817,00 €	4.482.237,00 €
Comptes de régularisation - Passif	43.779,00 €	209.776,00 €	266.545,00 €	206.722,00 €	406.080,00 €	927.704,00 €	1.032.288,00 €	1.200.807,00 €	3.133.376,00 €
Passif	409.752,00 €	1.264.841,00 €	1.539.775,00 €	1.807.689,00 €	2.867.386,00 €	3.664.019,00 €	5.622.817,00 €	6.911.433,00 €	9.533.895,00 €
<b>Actif</b>									
<b>Frais d'établissement</b>									
Actifs immobilisés	287.902 €	974.606 €	1.079.435 €	1.184.750 €	1.443.632 €	1.953.797 €	2.230.449,00 €	4.288.328,00 €	6.637.512,00 €
Immobilisations incorporelles		22.946 €	139.390 €	230.057 €	406.619 €	478.623 €	444.530,00 €	402.502,00 €	429.460,00 €
Immobilisations corporelles	287.852 €	948.267 €	925.324 €	953.143 €	1.028.062 €	1.467.224 €	1.768.569,00 €	3.877.375,00 €	6.189.851,00 €
Immobilisations financières	50 €	3.394 €	3.394 €	1.550 €	8.951 €	7.951 €	17.351,00 €	8.451,00 €	18.201,00 €
Actifs circulants	121.851 €	290.235 €	460.339 €	610.443 €	1.372.746 €	1.662.640 €	3.305.153,00 €	2.564.423,00 €	2.842.904,00 €
Stocks et commandes en cours d'exécution	25.762 €	115.684 €	107.470 €	258.387 €	301.664 €	1.082.693 €	919.614,00 €	923.278,00 €	1.371.795,00 €
Créances commerciales à un an au plus	28.799 €	32.559 €	56.296 €	168.582 €	207.438 €	211.419 €	206.477,00 €	457.534,00 €	641.714,00 €
Autres créances à un an au plus	6.017 €	15.890 €	166.207 €	30.449 €	149.260 €	122.866 €	407.608,00 €	460.786,00 €	564.718,00 €
Valeurs disponibles	59.372 €	124.181 €	126.417 €	140.494 €	667.163 €	218.480 €	1.306.491,00 €	464.931,00 €	190.245,00 €
Comptes de régularisation - Actif	1.900 €	1.921 €	3.949 €	12.531 €	47.221 €	27.183 €	12.642,00 €	75.512,00 €	74.432,00 €
Actif	409.752 €	1.264.841 €	1.539.775 €	1.807.689 €	2.867.386 €	3.664.019 €	5.622.817,00 €	6.911.433,00 €	9.533.895,00 €

Figure 3: Summary of the balance sheet liabilities and balance sheet assets as found on Welipro and completed with published financial report at the National Bank of Belgium.(6)(7)

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