



PAILLE-TECH 10 YEARS: WHAT'S NEXT?



The Paille-Tech story in 3 phases

2010-2014: starting and creating



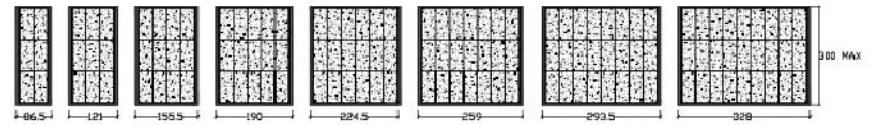
2015-2019: developing and consolidating



2020-2024: optimising, doubling and franchising ?

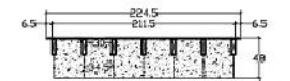
Defining the concept: wood + straw

Prefab wooden frame + straw bale insulation



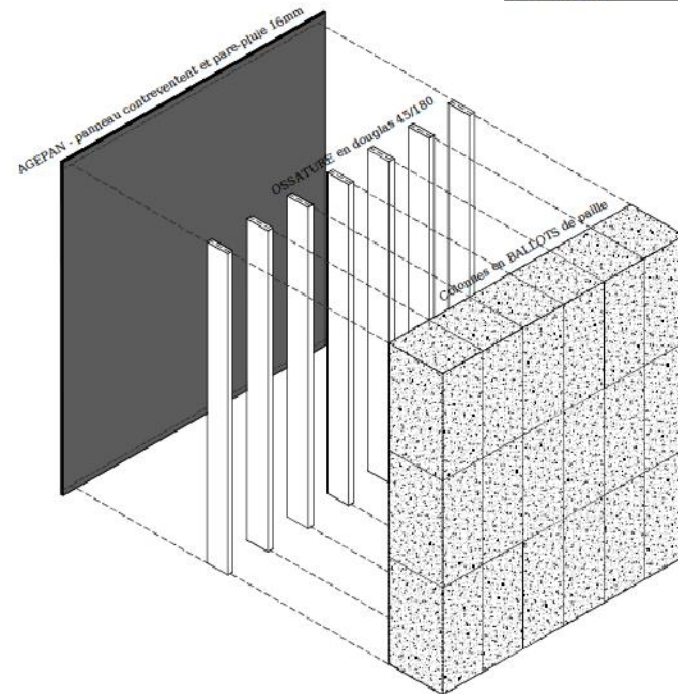
VUE EN ELEVATION :

DE 2 A 9 COLONNES DE BALLOTS



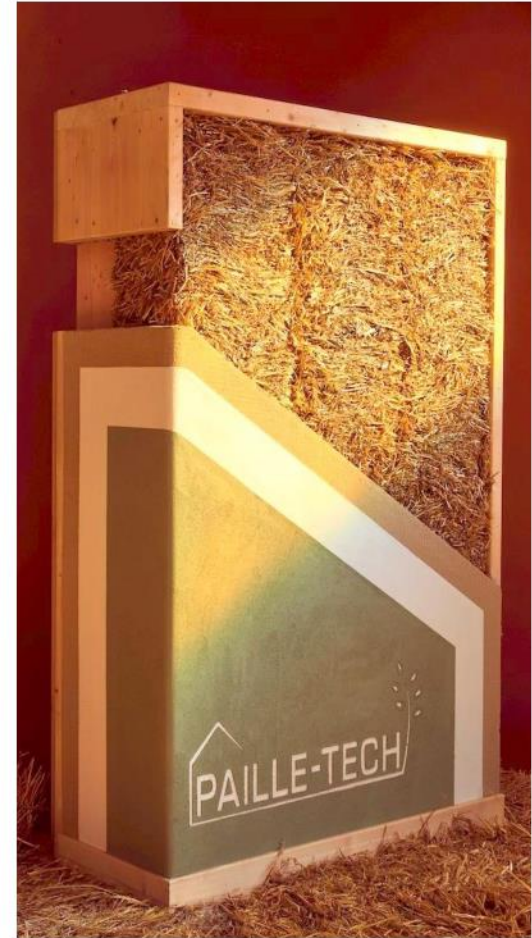
VUE EN PLAN

1/50



Defining the concept: wood + straw

Adapted process and tools



Defining the concept: straw + clay

Prefab walls horizontally plastered in clay



Defining the concept: straw + clay



Adapted process and tools



Securing straw provision



Looking for recognition and support

R&D

Public support

Architects and stability
engineers involved

La paille matière première

Recherche **APROPAILLE**

*Vers une reconnaissance de la paille
comme matériau isolant dans la construction*

• Vadémécum 1 •



**UNIVERSITÉ CATHOLIQUE DE LOUVAIN
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DE HERDE André, Professeur
EVRARD Arnaud, Dr. Ingénieur Architecte
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LEBEAU Frédéric, Professeur
LOUIS Arnaud, Ingénieur Civil des constructions



PAILLE-TECH SCRL

BONNERT Antoine, Architecte

AVEC LE SOUTIEN DE :



Wallonie

Realising the first 20 building operations

Individual houses and annexes



Big store



1 co-housing (4 houses)



Conclusion of phase 1: exhausting but ready for phase 2

- Exciting creation time with trials and mistakes
- Machines and product ready
- Difficulty to pay all contributions + financial losses
- Exhausted people and departures
- Order book empty

=> Stop or go on?

Phase 2: new people, new money

New skills in management and administration
New direction



Increases in capital:

Capital in 2014: 160.000 €

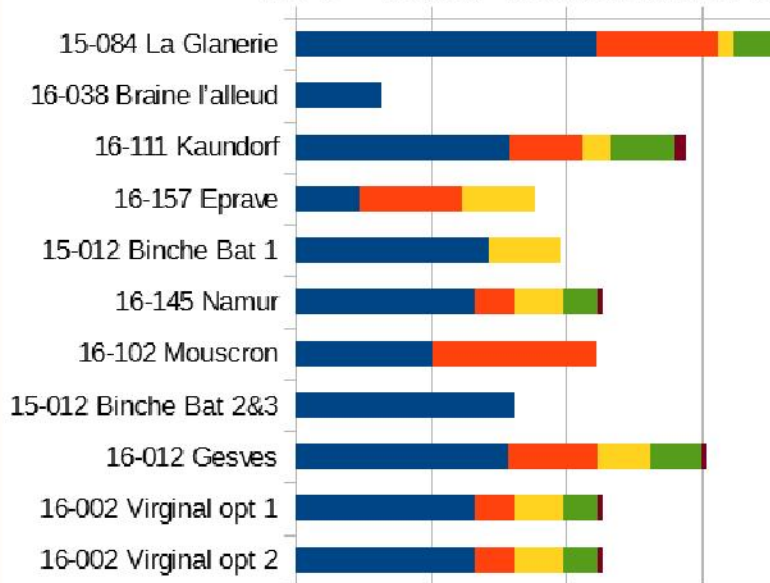
Capital in 2016: 420.000 €

Capital in 2019: 820.000 €

Investing in IT, management and communication

Temps de prefab 2017

0,00 h 500,00 h 1.000,00 h 1.500,00 h 2.000,00 h 2.500,00 h



NATUREL

Utilisation de matériaux naturels et renouvelables, la plupart d'origine végétale. Une belle solution pour



SAIN

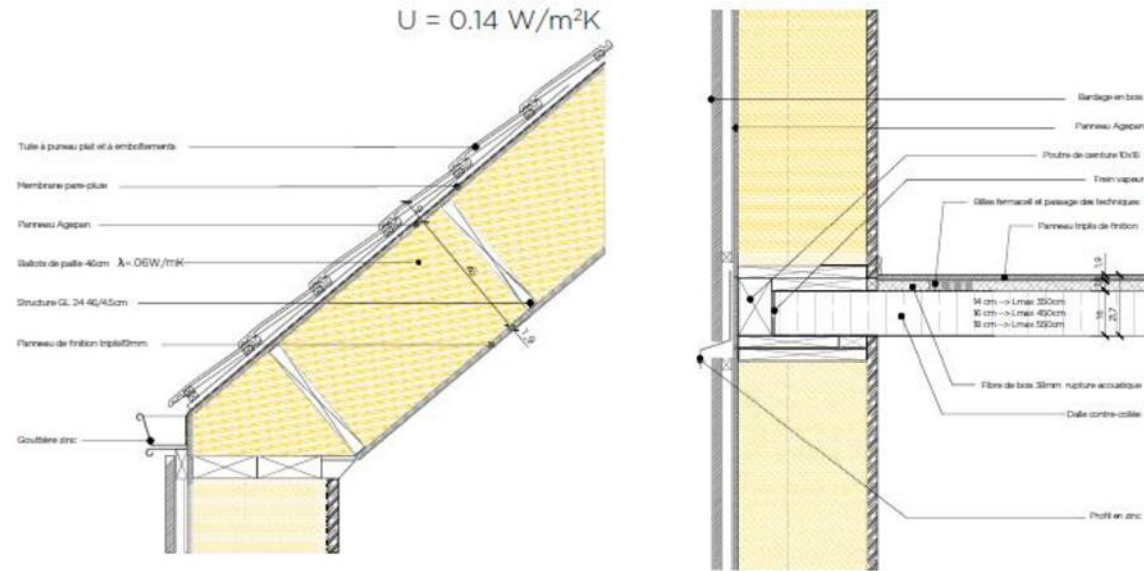
Un air intérieur de qualité grâce à la gestion naturelle de l'humidité par l'enduit terre et l'absence de



PERFORMANT

Constructions performantes sur le plan énergétique ET un système constructif avec une très faible empreinte

Systematising production and adding capacity



Facing multiple risks

Real estate: buying and adapting production halls



Technical risk: improving our self-built machines

Fire risk: improving our reaction capacity



First public procurements

Pro: size and visibility

Contra:

- Complexity
- Irregularity
- Regulation
- Lack of competition

Anyway: work with big construction firms

Won: 3 (2 halls and a school)

Lost: 3, incl cluster offices

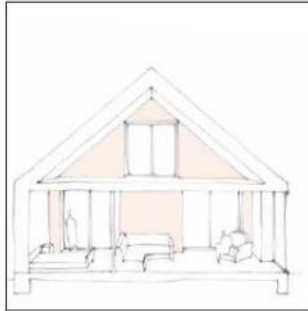


A new concept: optimal house

SMALL

4 façades
rez + toiture habitable
2 chambres dont une au rez
1 sdb
96 m² intérieurs nets

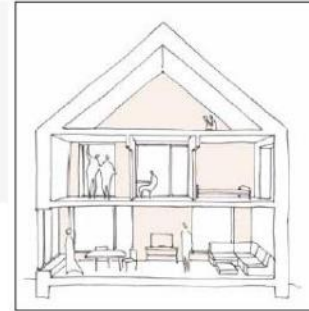
La maison idéale
pour une retraite
confortable.



LARGE

4 façades
rez + 1 + toiture habitable
4 chambres
1 sdb
160 m² intérieurs nets

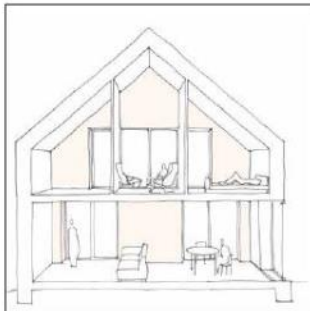
Le plaisir
d'un 2^e étage.



MEDIUM

4 façades
rez + 1 étage complet
3 chambres
1 sdb
128 m² intérieurs nets

La maison
familiale
compacte.



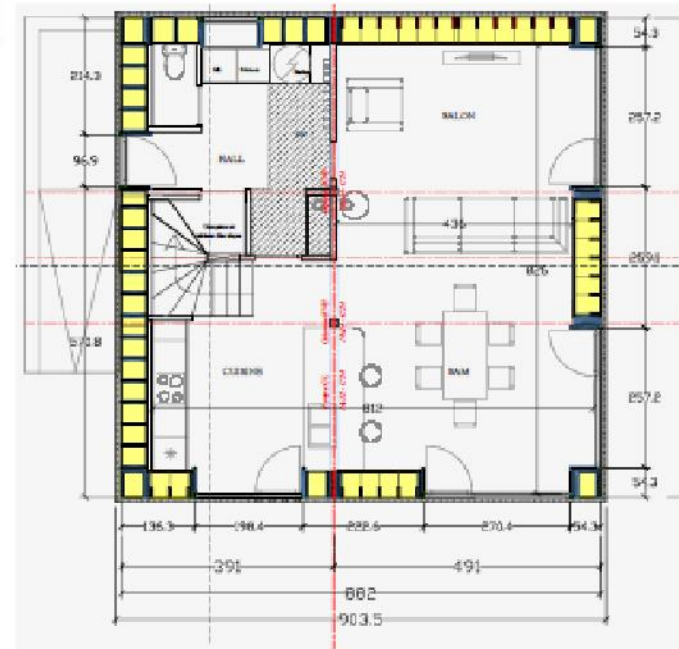
EXTRA LARGE

4 façades
rez + 2 étages complets
4-5 chambres
2 sdb
180 m² intérieurs nets

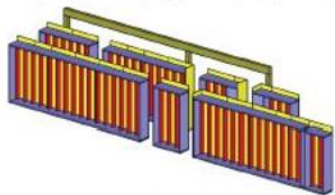
De l'espace
à profusion.

Habitation très basse
énergie
Besoins nets en chauffage :
25 kWh/m².an.

Umax / K/mn	Niveau K	Niveau L	...
✓	20.0	60.0	100.4



A new concept: optimal house



Rez-de-chaussée

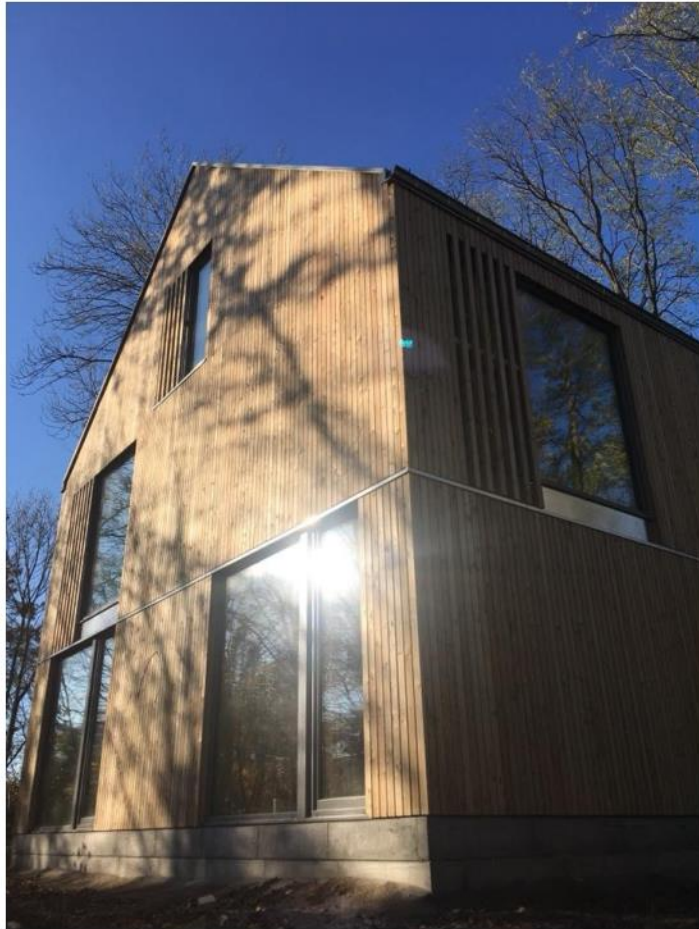


Etage



Etage sous comble

A new concept: optimal house



Irregular orders and low profitability

Planning de production 2018	Surfaces prévues			Temps prévu			Planning Préfab continue	
	Murs	Toitures	Tot surf à produire	Nb jours ouvrables	Nb jours calendriers	Semaines	Début	Fin
16-102 Mouscron (Justine)	120,00 m2	411,00 m2	531,00 m2	22 jrs_ouv	30 jrs_cal	4,3 sem	08/01/18	07/02/18
15-012 Binche Bat 2&3 (Justine)	204,99 m2	0,00 m2	204,99 m2	19 jrs_ouv	28 jrs_cal	3,9 sem	08/02/18	12/03/18
Bois et Habitat					7 jrs_cal	1,0 sem	13/03/18	20/03/18
16-007 Pont à Celles (Antoine+François)	187,02 m2	113,50 m2	306,86 m2	22 jrs_ouv	32 jrs_cal	4,6 sem	21/03/18	02/05/18
17-002 Momalle (Justine)	39,90 m2		39,90 m2	4 jrs_ouv	6 jrs_cal	0,9 sem	10/05/18	17/05/18
16-012 Gesves (Antoine+François)	199,25 m2	192,43 m2	398,75 m2	27 jrs_ouv	38 jrs_cal	5,5 sem	18/05/18	25/06/18
17-011 St Symphorien (Justine)	180,00 m2	90,23 m2	275,05 m2	21 jrs_ouv	30 jrs_cal	4,3 sem	26/06/18	26/07/18
16-002 Virginal (Justine)	168,29 m2	85,76 m2	262,73 m2	20 jrs_ouv	28 jrs_cal	4,0 sem	03/08/18	09/09/18
18-007 Braine-le-Château Rivéra (Justine)	140,00 m2	152,00 m2	449,00 m2	30 jrs_ouv	42 jrs_cal	6,1 sem	08/11/18	21/12/18
	1.239,45 m2	1.044,92 m2	2.468,28 m2	163 jrs_ouv	242 jrs_cal	34,6 sem		

Commercial efforts not always successful with particulars

Necessity to work with real estate companies to secure bigger volumes

Realising 40 building operations

▪ BRASSERIE DE LA LESSE.



▪ MAISON POLYVALENTE À LA GLANERIE.

Conclusion of phase 2: first class product but not profitable yet

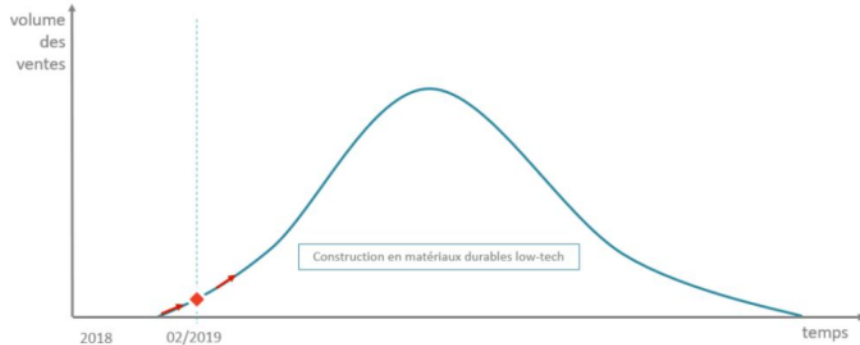


Improving the business model and doubling the market

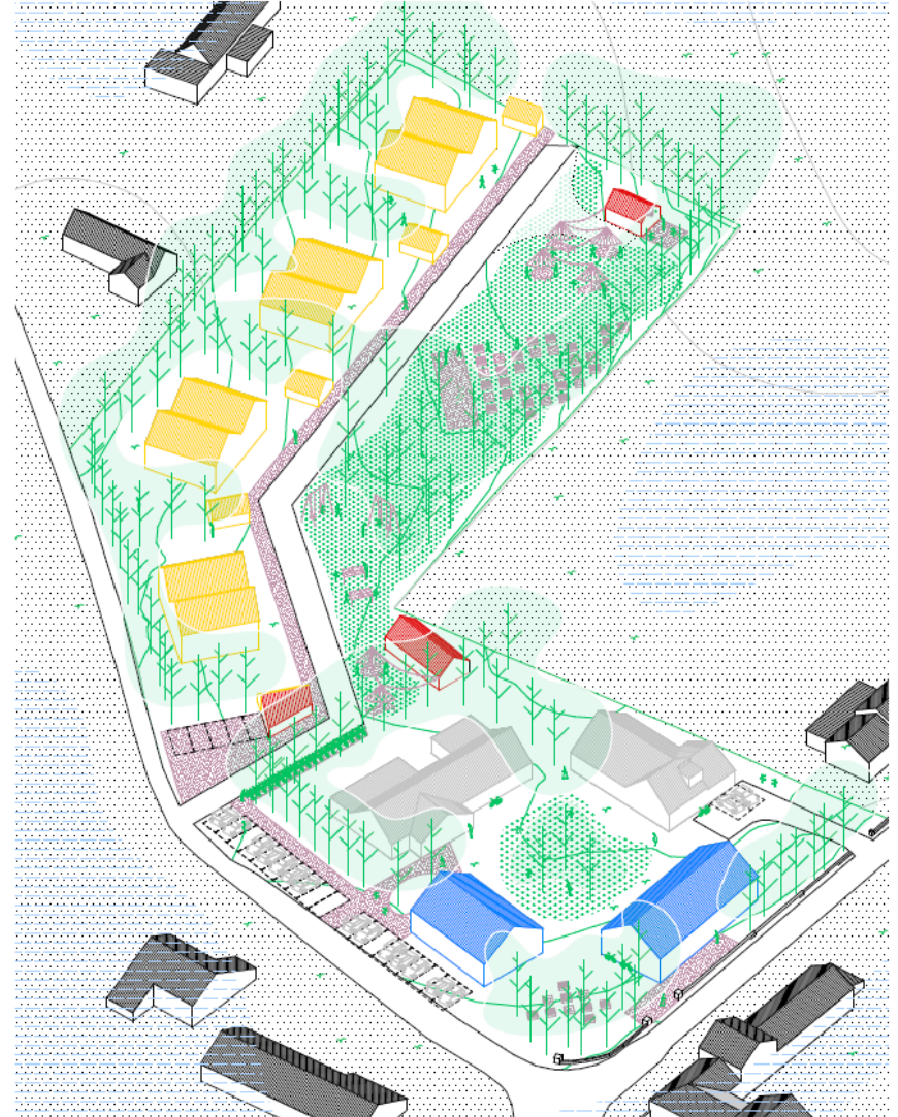
Daring higher prices,
related to high quality

Working on bigger projects
with real estate actors

Cooperating with more
architects



PAILLE-TECH
la maison positive



Optimising processes and doubling capacity

Big challenge: changing the size without changing our DNA

From 10 to 20 contracts a year,
from 1 house a month to one
every 2 weeks !

=> logistics, capacity, tools, HR
problems to solve



Franchising in a cooperative way

Many demands coming particularly from France

No interest to transport straw walls all over Europe

Interest for small production units, using the concepts and tools developed, and improving them together.

Inspiration: Treppenmeister (stairs), Optiwin (windows)



Straw building in Belgium: other initiatives



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**Les
Bâisseurs
Accueillants**



**... un
Chantier
Participatif**

AiSBL

PAILLE-TECH
la maison positiv

Straw building in the total building market in Belgium

Year 2017	Market	Paille-Tech	%
Employment	250,000 p	12 p	0,005%
Turnover	50,000 M°€	1,25 M°€	0,0025%
Number of Housing units	50,344 HU	10 HU	0,02%
Of which individual houses	19,149 HU	10 HU	0,05%
M ² built in a y (residential)	10,000,000 m ²	2,000 m ²	0,02%

There is much room for growth !
There is room for newcomers !

Building with straw: fit, flexile, zen



Thank you for your attention



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