

The Developments and Solutions in the Hemp Building Market in the Netherlands



Sissy Verspeek

Hemp building market in the Netherlands
June 2016

The Developments and Solutions in the Hemp Building Market in the Netherlands



A little something about myself:

- ✧ Sissy Verspeek is a Building engineer (BSc)
- ✧ Owner of the company Natuurlijk Thuis (Naturally Home)
- ✧ Networker
- ✧ Specialist in biobased and natural building materials
- ✧ LCA analyst
- ✧ Secretary of the Board of Agrodome
- ✧ Member of the board of the Dutch strawbuild association
- ✧ Member of the Dutch Hemp-crete association

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The Developments and Solutions in the Hemp Building Market in the Netherlands

- ↻ The Green Deal Natural Fibers
- ↻ Dutch Hemp-crete association
- ↻ Hemp-crete projects in the Netherlands
- ↻ Hemp product developments

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Green Deal Natural Fibers



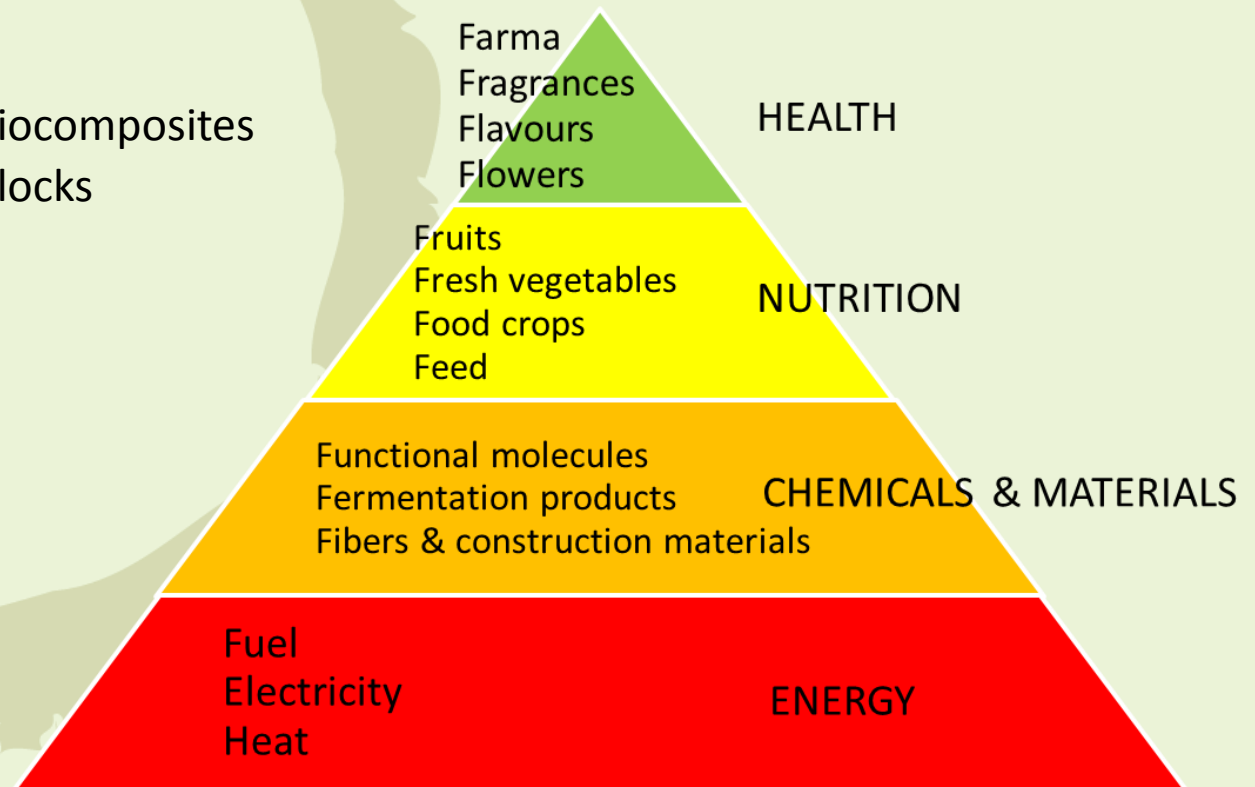
Participants Green Deal Natural Fibres

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Green Deal Natural Fibers

Goal is to optimize the use of Hemp (and Flax)

- 🌀 Animal stock
- 🌀 Textiles
- 🌀 Building Materials, Biocomposites
- 🌀 Building Materials, Blocks



Value Pyramid Hemp

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Green Deal Natural Fibers



Demonstration project: Rondeel stables
Stables designed for the wellbeing of the chickens.
Looking for solutions in the building materials, hemp-based



Demonstration project: Rondeel stables

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Why use hemp for buildings:

- ↻ Good moisture regulating abilities
 - ↻ Vapour diffusion open
- ↻ Good insulation value
- ↻ Heat storage capacity, mainly for hemp-crete products
 - ↻ In the Netherlands hydrate lime is used for Hemp-crete the same as in Belgium:
 - ↻ This cement free (clean lime) is better for the inner climate because of better moisture regulating abilities
 - ↻ Better for the environment
 - ↻ Hemp-crete is in the Netherlands mostly used for the walls, almost never for the roofs or the floors
- ↻ It gives strong, flexible, light weight fibers
 - ↻ Mostly used for biobased composites

Why use hemp for buildings?

Dutch Hemp-crete association



- ↪ The association started in 2014
- ↪ Active in Research & development (info via www.kalkhennepbouwnederland.nl)
 - ↪ LCA studie
 - ↪ Earthquake testing
 - ↪ Studie to find most ideal fiber size (tested by Faserinstitut in Bremen)
 - ↪ Developing standard buildingdetails
- ↪ Working together with Dutch professionals i.a.:



KHNL: Dutch Hemp-crete association

Hemp buildings in the Netherlands



Renovation: Buddhist centre in Rotterdam

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Hemp buildings in the Netherlands



Renovation project, inside insulation

- This building functioned as a retail complex.
- The hemp-crete insulation was constructed in situ.
- Now the Buddhist temple is transformed into a warm and welcoming centre of the people in de neighbourhood

Renovation: Buddhist centre in Rotterdam

Hemp buildings in the Netherlands



Renovation: Historic farmhouse in Breukelen

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Hemp buildings in the Netherlands



KalkHennepBouw
Nederland

gezond wonen!

Renovation project, inside insulation

- A historic farmhouse of approximately 200 years old. The owner says: 'this house is already 200 years old but I want to restore it in a way to make it last another 200 years more. Make it ready for the future'!
- All hemp-crete is constructed in situ.

Renovation: Historic farmhouse in Breukelen

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CAPEM

Cycle Assessment Procedure for Eco-impacts of Materials

Agrodome

Hemp buildings in the Netherlands



Renovation: Residential house in Zevenhuizen

Hemp buildings in the Netherlands



Renovation project , inside insulation

- On the groundfloor the hemp-crete insulation is applied in situ.
- On the first floor hemp-crete brick were used to insulate the outer wall.

Renovation: Residential house in Zevenhuizen

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Hemp buildings in the Netherlands



Residential house in Veghel

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Hemp buildings in the Netherlands



- ✎ The first new build residential house in the Netherlands with hemp-crete insulation.
- ✎ The hemp-crete insulation of the walls is applied in situ.

Residential house in Veghel

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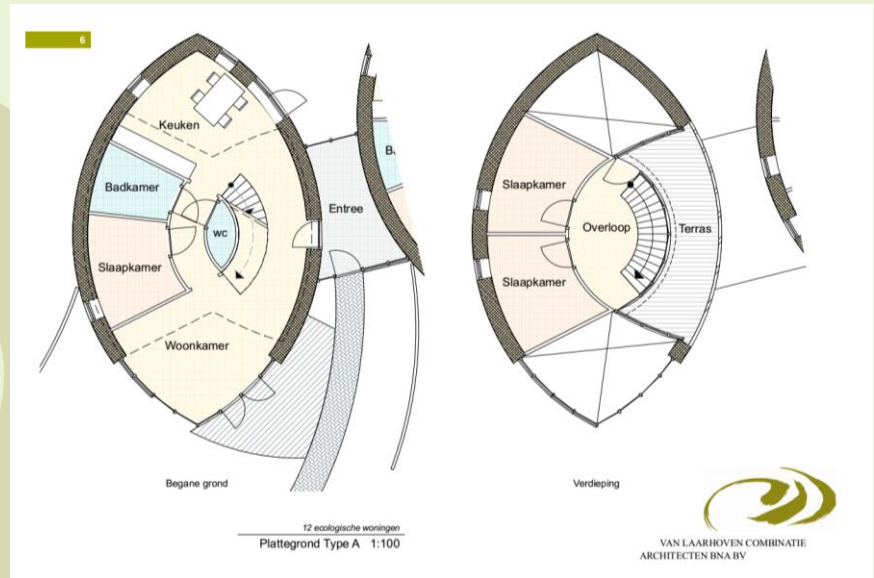
Hemp buildings in the Netherlands



A small ecovillage of 35 houses in Boekel

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Hemp buildings in the Netherlands



- 35 rental houses, a community centre, a workshop and offices.
- They will have their own food, energy and water supply
- A ecological water purification system
- The hemp-crete insulation of the walls will be applied in situ.

A small ecovillage of 35 houses in Boekel

Hemp buildings in the Netherlands



Residential house in Ede

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Hemp buildings in the Netherlands



- ✧ Foundation: foam-concrete Rc 7,8
- ✧ Walls: in situ hemp-crete in timber frame of 37 cm deep, finished with lime plaster
- ✧ Interior walls: hemp-crete blocks from Isohemp
- ✧ Floor: tie beams, floor joints, floor parts douglas pine
- ✧ Roof: prefab Isovlas roofelements with Ceramic roof tiles
- ✧ Usable area of 158 m²



Residential house in Ede

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Hemp buildings in the Netherlands



- ✧ The construction of this project is similar as the project in Ede.
- ✧ Facade cladding is made of wood from Plato (Thermally modified wood)
- ✧ Woodfiber binded slates for the roof tiles
- ✧ Usable Area is 132 m²



Kazerneterrein Ede

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Prefab hemp-crete elements



- ∞ Dun Agro developed prefabricated Hemp-crete elements. With these elements they build a demonstration house to show their customers a possibility to build a house with hemp.
- ∞ They use Vicat Prompt Natural Cement, this is a Hydraulic lime binder.

Demo house made of hemp-crete prefab elements

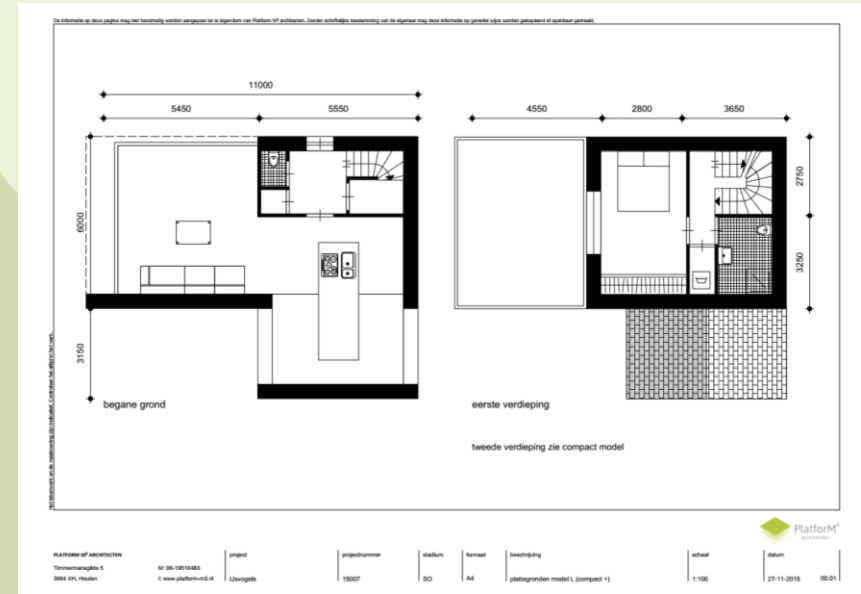
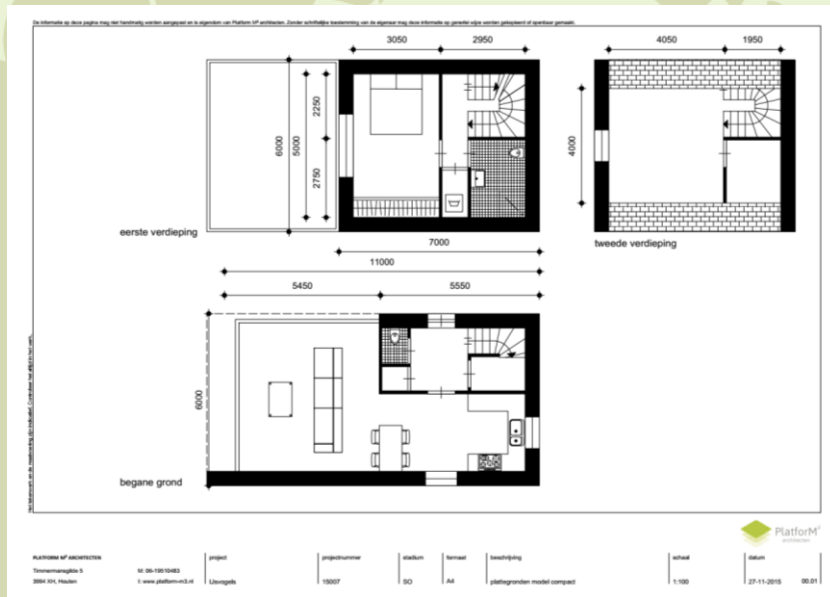
Concept houses



Project 'Ijsvogels'

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Concept houses



Specifications: Foam concrete foundation Rc 8, Hemp-crete walls Rc 6,5, prefab roof-elements with flax-insulation Rc 9, window frames of Finti wood, lime floor and wall finish, cladding of wood or lime plaster.

Possible installation: IR-panels, PV-panels, floor heating/cooling, Shower heat exchange, decentralized heating, instant water heater.

Possible sizes: 80, 100, 120-140 or >140 m².

Project 'Ijsvogels'

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Biobased composite benches



Made possible by: students of Inholland, Schiphol Airport, municipality Haarlemmermeer, Strukton Prefab Beton, TheSolidGrounds (TSG), Hempflax and the Miscanthusgroup.

The first biobased benches on Schiphol

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Biobased composite benches



- ✧ Hempflax was involved in the development of biobased benches made of a biobased composite with hemp fibers
- ✧ In the landing area of Schiphol hemp and Miscanthus plants are grown. These plants help to prevent bird problems and are sound absorbing. The fiber of these plants was used for the benches.

The first biobased benches on Schiphol

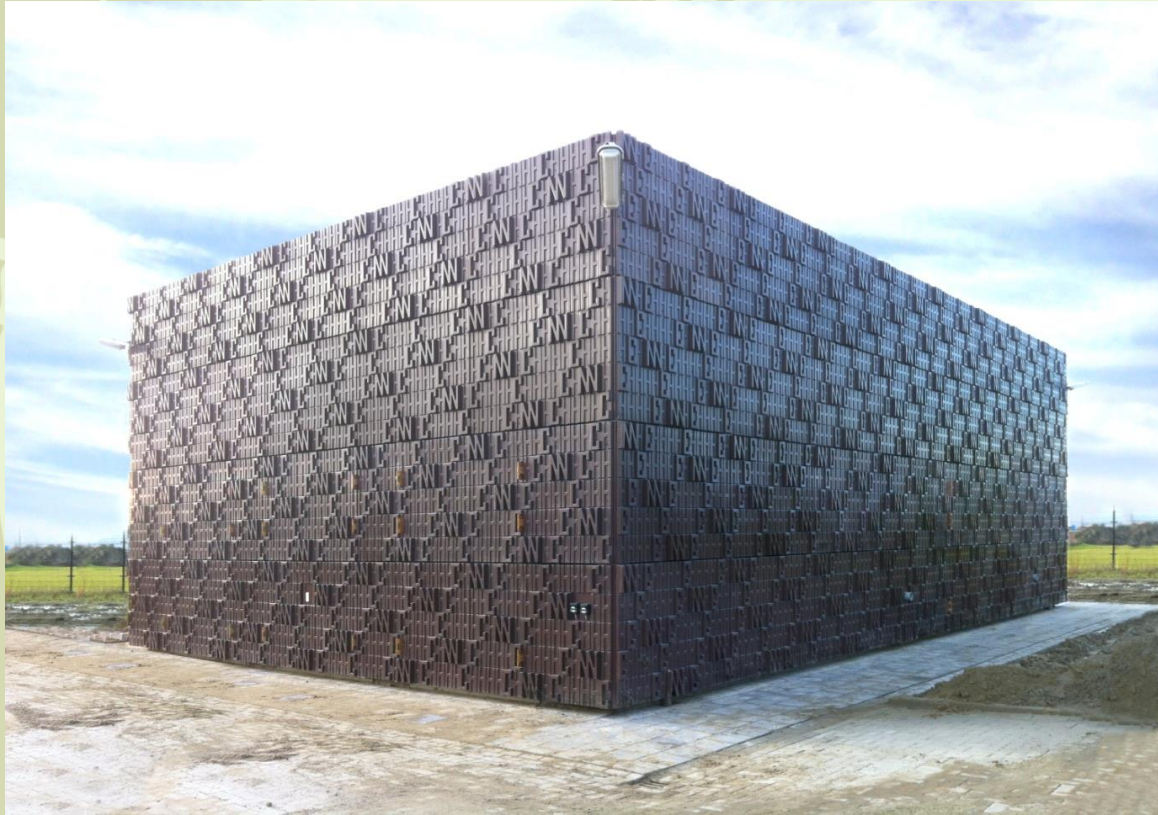
Biobased composite cladding



Biobased facade cladding

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Biobased composite cladding



The first biobased composite cladding with hemp fibers in the Netherlands.

Biobased facade cladding

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More Information



More information about the R&D:
www.kalkhennepbouwnederland.nl

www.agrodome.nl
info@agrodome.nl