

# Sustainable structural solutions from hemp

- Region: Southwest Finland



**Theme: Recycling and resource efficiency**  
*Jenni Suominen & Timo Mieskonen, 20th of April, 2021*

# Sustainable structural solutions from hemp

- The project meant to **bring sustainable and recyclable material** for the construction industry to use
- **Project time: 1.4.2016-30.6.2018, funded by ERDF**, project led by Turku UAS
- The long-term goal was to develop resource efficiency and carbon neutrality, as well as to make hemp construction an alternative at the raw material level
- The entire hemp construction project tested domestic hemp and domestic lime
- The target groups for hemp construction are many, but primarily large companies, designers and architects. Since the house must be explicitly designed as a hemp house, architecture plays a big part here. Other target groups were people working in product development.



# Benefits of hemp building

Reducing the need for imports: The hemp building can be built from 100% domestic materials.

Recyclability and Circular Economy value: material from the field to the product and back to field

Improving the value of renewable raw materials

Reducing energy consumption and energy efficiency

The reduction of waste and chemical loads

Promoting carbon-neutral construction and the circular economy:  
Hemp strongly binds carbon dioxide: hemp-lime structure binds carbon dioxide for years from construction

Increase of sustainable domestic business and jobs



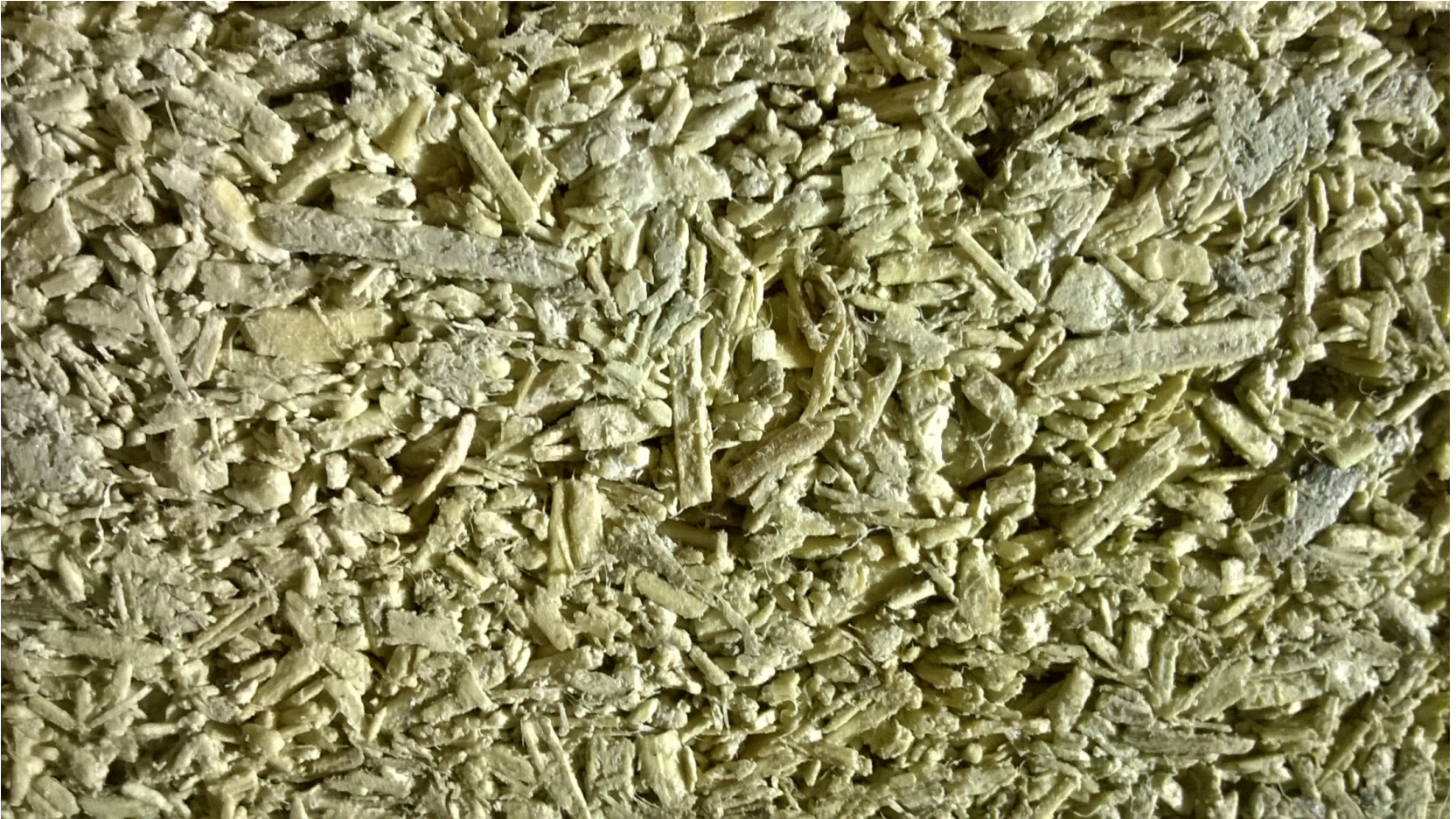




# What was done?

- The raw material for hemp construction consists of an aggregate (hemp head), a binder (slaked lime) and water.
- Various mixtures and tests were performed with the stakeholders (e.g. companies) and it was found that the domestic material worked.
- The recyclability of the structures was tested at the Tuorla Agricultural School, where the material was crushed into the ground and found to be degraded.
  - The material was also found to improve soil structure, and hemp cultivation can be resumed from these points.
- Construction of the house was not originally planned, but because a lot of material was available and time was right for the pilot house. The pilot house gave chance to test the properties of the hemp element in a concrete way.
  - Currently, the house is furnished and serves as an exhibition space for hemp houses.

Hemp shive + lime (+ water) = breathable and insulating massive structure













# Lessons learned from the GP

- Succeeded in **producing the information for the construction sector** about the valuable material in Finnish conditions
  - A Finnish language **publication** has comprehensive guidance about the building process of a hemp house.
- During the construction of the house, it was possible to study **the drying of the material and properties of the hemp elements**. The need for an investment in an **injection molding machine** was proven, as it is now rented for company operating in the field.
- It was found, that in Finland, **hemp dries on its own in winter and can be grown all the way to Lapland**, which makes it ecological and sustainable.
- The **availability of domestic material is a challenge**, as the material must be a certain type and homogenous quality.
  - **Processing and certification** still needs to be developed, and the possibility of hemp as an export product should also be explored.
- **The Finnish Utility Hemp Association**, established as a by-product, is an important tool in completing the project and taking the matter forward.



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# Thank you!

*For more information, please contact:*

***Päivi Simi, Project Advisor  
Turku University of Applied Sciences  
[paivi.simi@turkuamk.fi](mailto:paivi.simi@turkuamk.fi)***