

Webinar Cattail, Paludiculture, Jan Köbbing 3N, Petra Boorsma Biosintrum

BBoBB

Interreg
North Sea



Co-funded by
the European Union

BBOBB

With BboBB we want

A leap of scale in Building Based on Biobased, that's our aim!

In the BBoBB project, 16 partners across five countries in the North Sea region work together to design, develop and **strengthen value chains for the use of biobased materials**. In our partnership all parts of the value chain are represented.

We believe that the transition to a circular economy is an important means of working on climate challenge, with the prospect of new business models. Therefore, the use of **biobased materials in construction (built environment, interior construction and civil engineering)** offers a unique opportunity which we want to seize.

This webinar is about: **Cattail, Paludiculture**



BBoBB Webinar 16.09.2025

Cultivation of cattail and its usage as building material in Germany

Dr. Jan Köbbing

**Interreg
North Sea**



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Welcome



3N Centre of Competence e.V.



- **since 2003 in Werlte**
- **since 2006 activities throughout the country**
- **2007 – Establishment of the 3N GmbH**
- **since 2010 a NGO 3N. e.V.**
- **since 2017 Competence-Center Paludiculture**
 - **since 2023 integrated in 3N Kompetenzzentrum**
- **3 offices with in total 25 employees**

3N Topics - Sustainability as an opportunity

sustainable land use

Smart Carbon Farming

KlimaFarming

Paludi & Markt

PALUDIFarming

RoNNi

Paludikultur
Niedersachsen

Paludi und Bau

NAPALU

X-Lives

New Materials

Emphati

APFeL

BBoBB

Renewable raw materials & timber construction

PeatFree

BiTop

PappelWERT

Circular economy & resource efficiency

bioenergy

ÖkoPro

Renu2Cycle

ReFarm

Realise Bio

BiotechTalent
Unlocked

Bioboost Pro

Klima
center

FutureBeeing

Wie wollen wir
wohnen

EU Interreg (14)

Bund (6)

Niedersachsen (2)

Landesmarketingfonds Holz
Kompetenzzentrum
Niedersachsen - Netzwerk
Nachwachsende Rohstoffe
und Bioökonomie e.V. **3N**

Peatland in Lower Saxony

- Peatland area: around 500.000 ha, (3.6% land are
- Emissions of all organic soils
 - 15,8 Mio t CO₂-eq./y
 - 17,7 % of total emissions
- Target – 1,65 t CO₂-eq./y till 2030

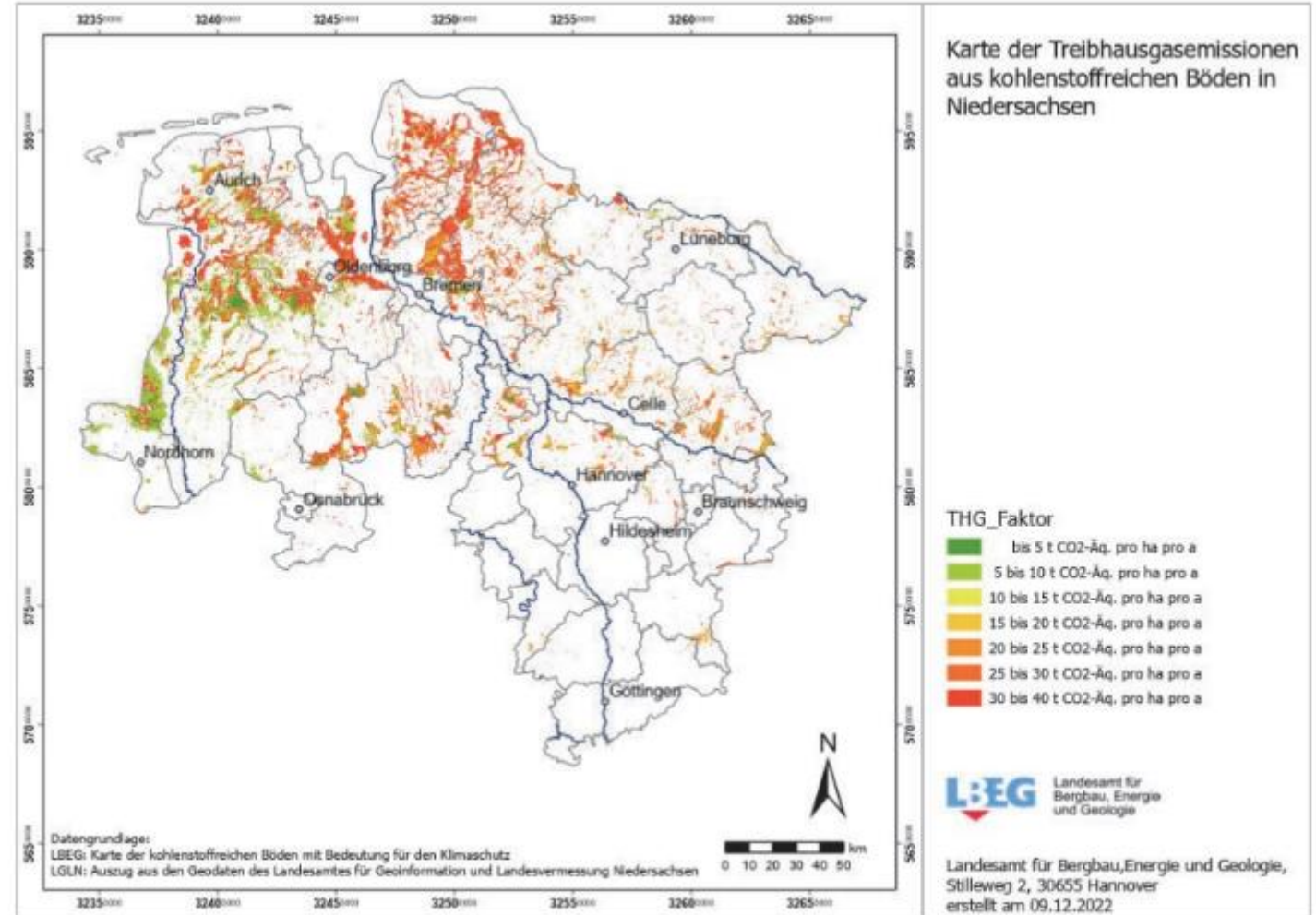


Abbildung 1: Karte der Treibhausgasemissionen aus Mooren und weiteren kohlenstoffreichen Böden in Niedersachsen. Dargestellt ist der mittlere Emissionsfaktor je Areal in Klassen (MOORIS 2023d).

Carbon stock

It's not just about size

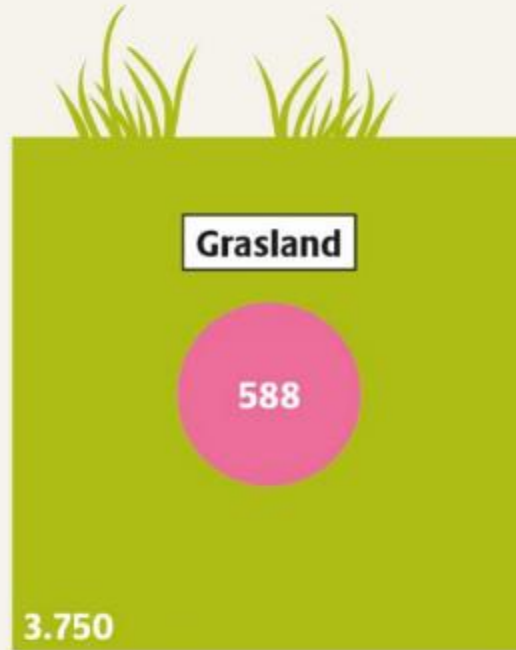
Area and stored Carbon by Ecosystem

- Area in million ha
- Stored carbon in million tonnes

Peatlands



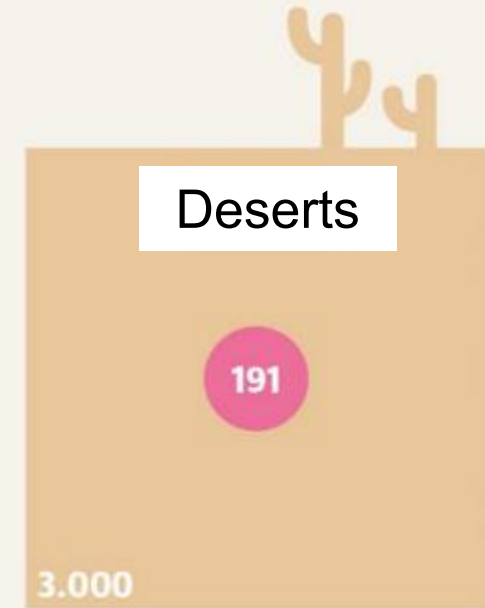
Grasland



Forest



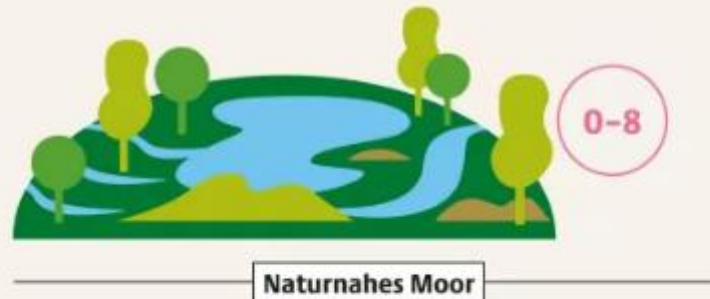
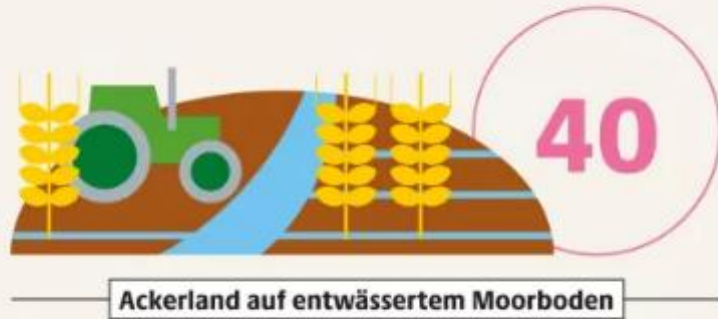
Deserts



Greenhouse emissions of peatlands

JE INTENSIVER DIE NUTZUNG, DESTO GRÖßER DER KLIMASCHADEN

Jährlicher Ausstoß von Treibhausgasen, in Tonnen CO₂-Äquivalente pro Hektar



© MOORATLAS 2023 | GWK, THÜNINGEN-INSTITUT



Paludiculture – general informations

Paludiculture (»palus« – lat. »mire, morass«) describes the agricultural or silvicultural use of wet organic soils. As a requirement, the water table needs to be kept near the surface the whole year round and the soil must hardly be disturbed. As a result the GHG-emissions will decrease to about zero.

•Paludiculture on raised bogs:

„*Sphagnum*-farming“



wet grassland



Paludiculture on fen:

reed



black alder



wet grassland



cattail



Paludiculture Competence Centre in Lower Saxony

Central information centre for paludiculture in Lower Saxony since 2017.
Integrated into the 3N Competence Centre since 2023

Countrywide information centre

- Events, lectures, publications, web-based platform for exchange and information: www.paludikultur-niedersachsen.de
- Knowledge transfer through network expansion and public relations work
- Bundling of project results/ transfer into practice
- Development of recommendations

Research & Development

- Initiation and support of practical pilot projects
- Development of new utilization concepts and product chains
- Evaluation of climate and environmental performance
- Development of new products/processing technology/regional processing concepts
- Supporting product development and advising companies



Niedersächsisches
Ministerium für
Umwelt, Energie,
Bauen und
Klimaschutz

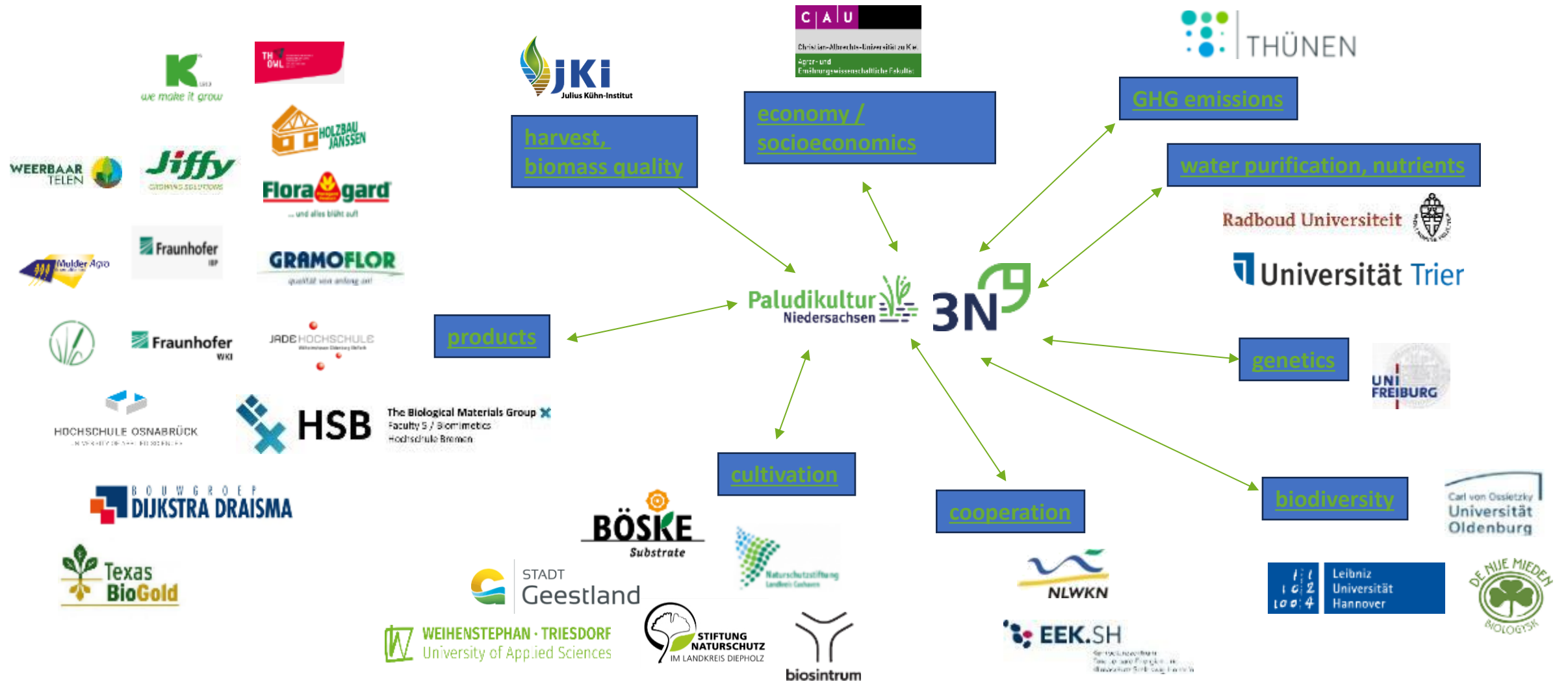


Informationsplattform nachhaltige Nutzung
der Moorböden in Niedersachsen

Der Niedersächsische Weg



Paludiculture network



Recent projects



Sustainable cultivation and utilisation of cattail on fenland sites in Lower Saxony (**RoNNi**)

funded by FNR, 2023 bis 2032



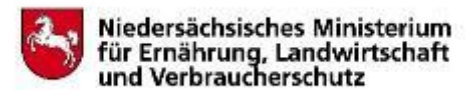
Sustainability of paludicultures with special focus on the nutrient balance (**NAPALU**)

funded by FNR, 2022 bis 2025



Climate-friendly cultivation concepts with paludiculture and region-specific development of paludiculture (**PALUDIFarming**)

funded by Nds. Ministry of Agriculture, 2022 bis 2025



Recent projects

Interreg projects

- Paludi & Market, 2022-2025
- Paludi & Building, 2024-2027
- BBOBB (Building based on biobased), 2024-2027

finished projects

- Interreg: Bioeconomy – Green Chemistry
- EFRE: Product chains from fenland biomass



BBoBB network



BBoBB network

Circulair Summit
Leeuwarden 2025
Visiting Petra's Pilot sites



BBoBB pilot

The pavilion is **transportable** and can therefore be used at various locations, to reach a broad audience.

In the drawers are **various wall structures made with bio-based building and insulation materials**, such as Typha, hemp, flax and straw.

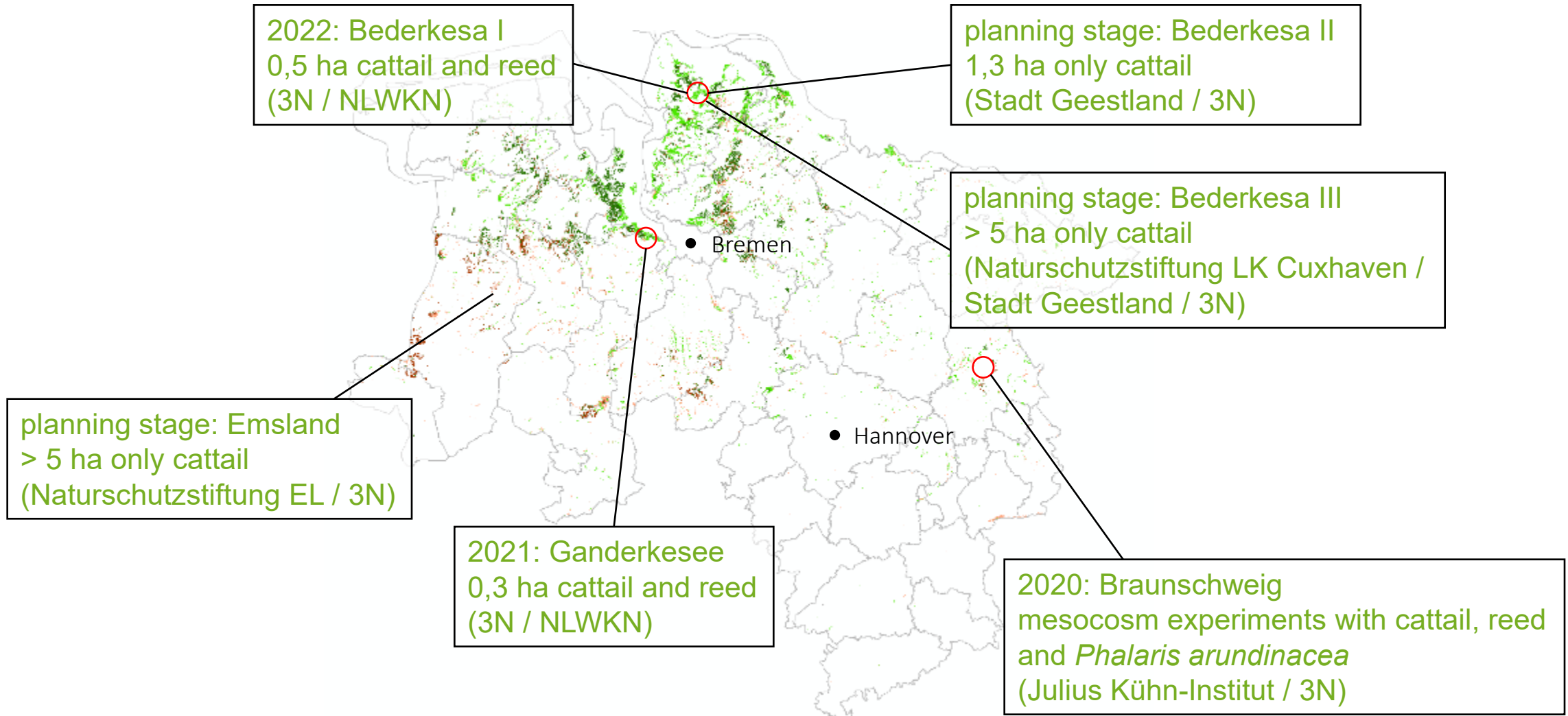
Panels provide in-depth information on the crops used and **practical examples**.



Greenmaterial-
Demonstration Pavillon
(Tiny House)



Cattail cultivation in Lower Saxony



3N Pilot sites with cattail and reed



2021: Ganderkesee
0.3 ha cattail and reed
(3N / NLWKN)

2022: Bad Bederkesa I
0.5 ha cattail and reed
(3N / NLWKN)



2025: Bad Bederkesa II
1.3 ha only cattail
(Stadt Geestland / 3N)



2026: Emsland
about 9 ha only cattail (3N)

2025: Bad Bederkesa III
about 7 ha only cattail
(Naturschutzstiftung LK Cuxhaven / 3N)



Installing the site in Bad Bederkesa



Monitoring on site

- yield and quality of biomass
- greenhouse gas emissions
- soil analysis
- water quantity
- water purification effects
- biodiversity



© LI-COR Biosciences



© Thünen Institut

© Thünen Institut

Harvest



...new machines will be tested soon (electric, unmanned and remote controlled)

[harvest film Bad Bederkesa](#)



Possible applications

***Horticultural substrate
(substitute for peat)***



Biopolymers



Building material



Production of insulation materials



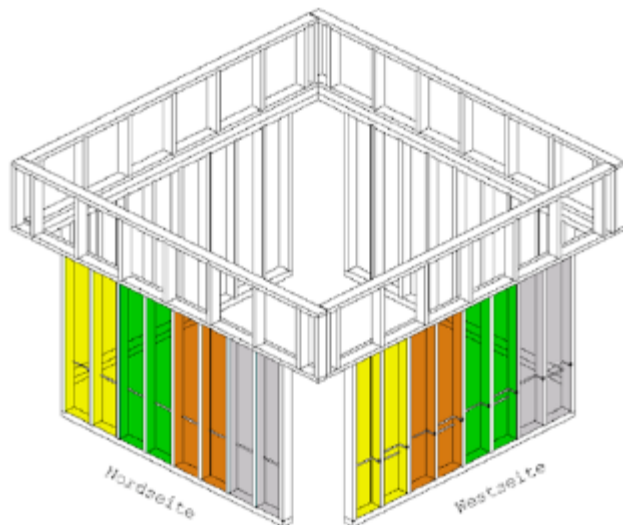
- Cattail is processed into insulation boards or loose fills
- Steps:
 - Addition of binders
 - Compression into boards
 - Curing with hot air or steam



Application and monitoring in model buildings



- Installation of various insulation materials in the exterior walls
- Locations:
 - „Science Cube“ in Werlte
 - Test building on the campus of Jade University in Oldenburg
 - used for seminars and informational events



Legend:

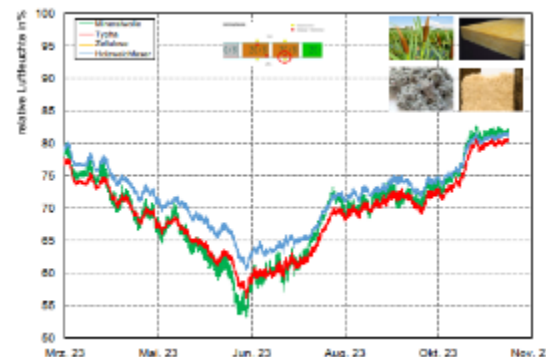
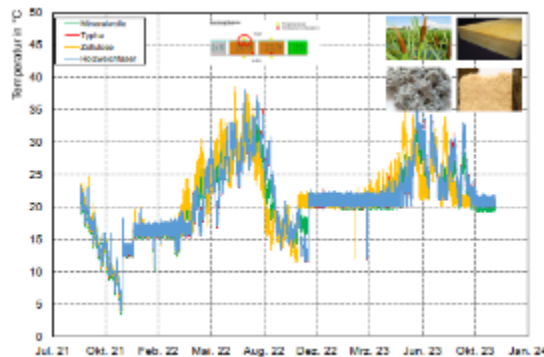
- Mineralwolle (Glas)
- Typha / Typha-Holzweichfaser (70/30)
- Holzwole



Application and monitoring in model buildings



- Monitoring of physical material characteristics using temperature and humidity sensors
- Validation through measurement data and lifetime simulation using WUFI software
- Results till today
 - Strong correlation between measured and simulated data in Oldenburg
 - Competitiveness with conventional insulation materials



Sustainability ist a chance
Thank you for your attention!



Proposition

- **How to accelerate the rewetting?**
- **How can we use more bio-based building materials?**



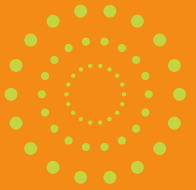
Welcome



biosintrum

WHAT WE DO

The Biosintrum is an 80% bio-based building, where we create a sustainable economy by being the connecting link, testing ground, between government, entrepreneurs and education. With the focus on developing as a center of expertise for "Wet crops"/peat meadow.



EDUCATION



GOVERNMENT



ENTREPRENEURS



WHY ARE WE, in Biosintrum, FOCUSSED ON PEAT MEADOWS?

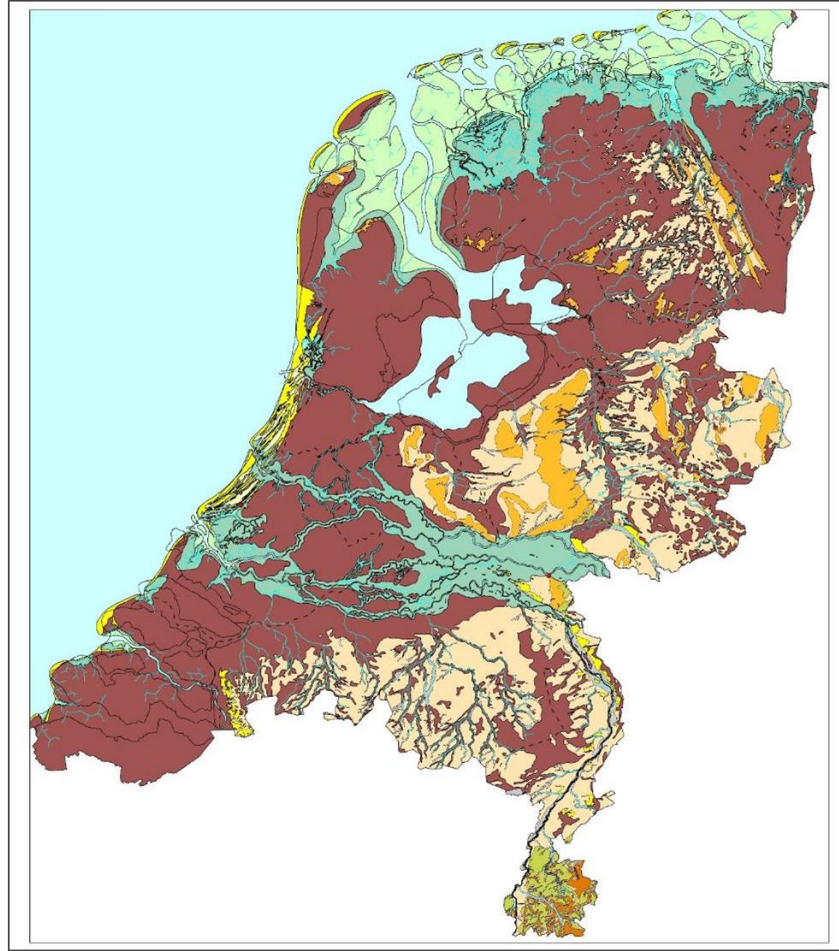
Peat meadows in Friesland total 89,000 hectares, of which 59,000 are agricultural, approx. 900 dairy farms (source: RVO 2018)

Problem: Land subsidence and CO2 emissions!

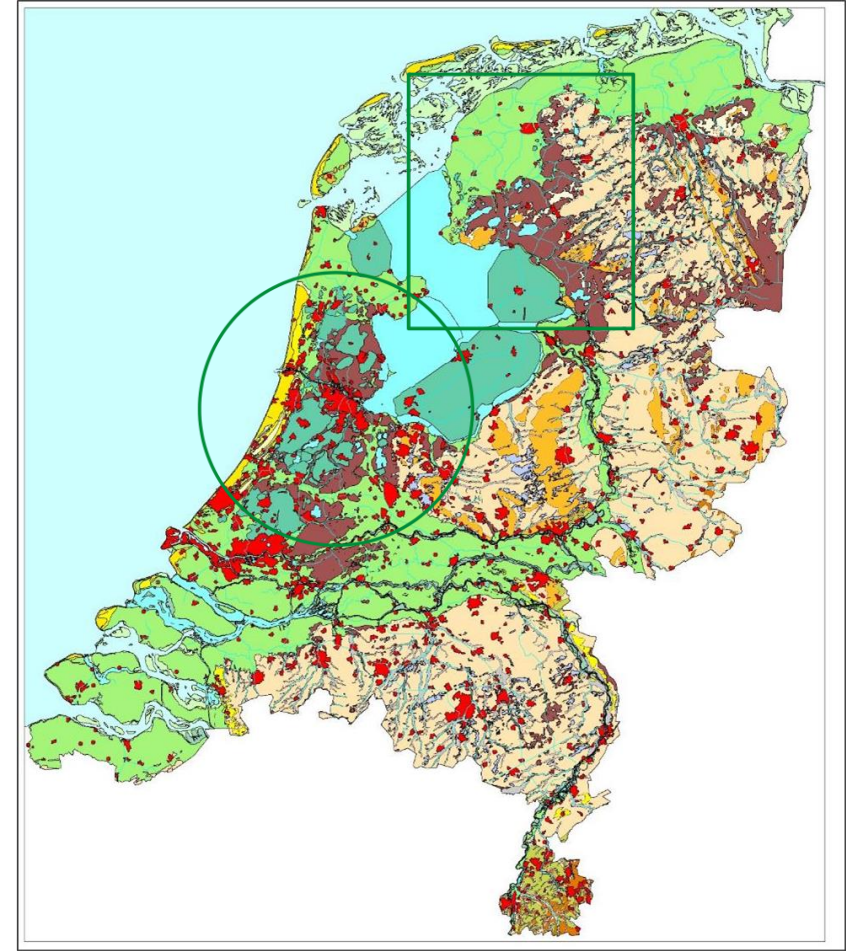
Frisian peat meadows account for 40% of national emissions from peat (peat meadow programme 2021-2030)



Peatland what is left in the Netherlands



AD100



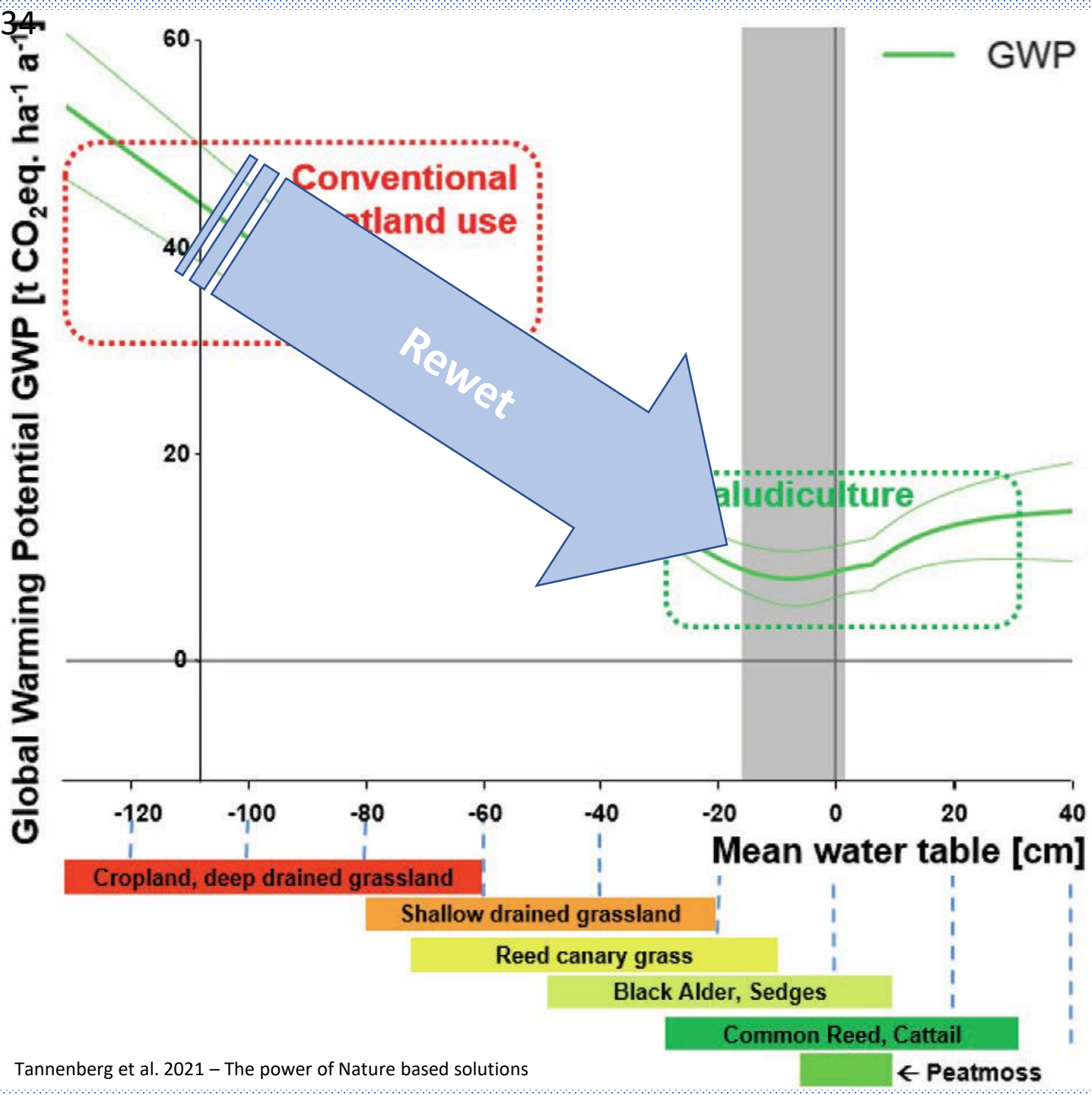
AD2000

Peatland



Peat is stacked plant remains when the waterlevels are low:

Oxidation of the peat causes the soil to *subside*. This has far-reaching consequences for water management in the polder. It also leads to further drying out of surrounding nature areas. *And CO2 is released*. Livestock farmers in the polder are experiencing the consequences of soil subsidence. This creates uncertainty for the future.

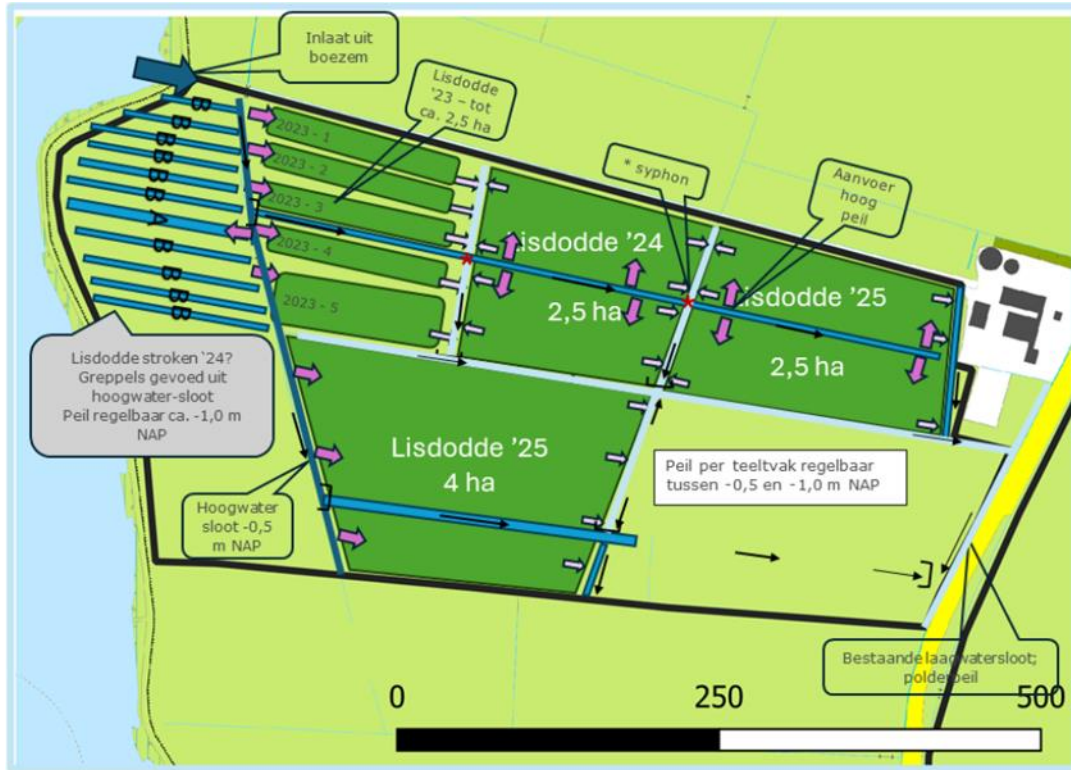


Solution: Rewet

How to create a new businessmodel?

Paludiculture =
alternative plants on
rewetted peat, like cattail!

Preparation sessions with Building constructors, educational institutes, Farmers, Biosintrum, Province of Friesland,
About how to create a value chain (2023)?



Creating first experimental rewetted fields, autumn 2023



EXPANDING REWETTING UP TO 8 ACRES IN 2024





Winter 2024/2025 harvesting



Products from paludiculture



1.ISOLATION; 2. PLA PLASTIC Construction BLOCKS; 3/4. PANEL SHEET 100%BIOBASED IN/OUTDOOR



Sheets from the project BboBb used for an outside expo building in Leeuwarden:Bouwwerk



Ecosystem services

- **CO₂ capture in 1. Soil and in 2. Building product**
- **Fewer nitrogen emissions due to fewer cows**
- **Cattail filters nutrients (fertilisers) from the soil and water, among other things.**
- **Peat meadows as water buffers for sufficient (drinking/irrigation) water in the future**
- **Counterpressure against salinisation**
- **BIODIVERSITY!!!!!!**



Example of ecosystem service: water purification capacity



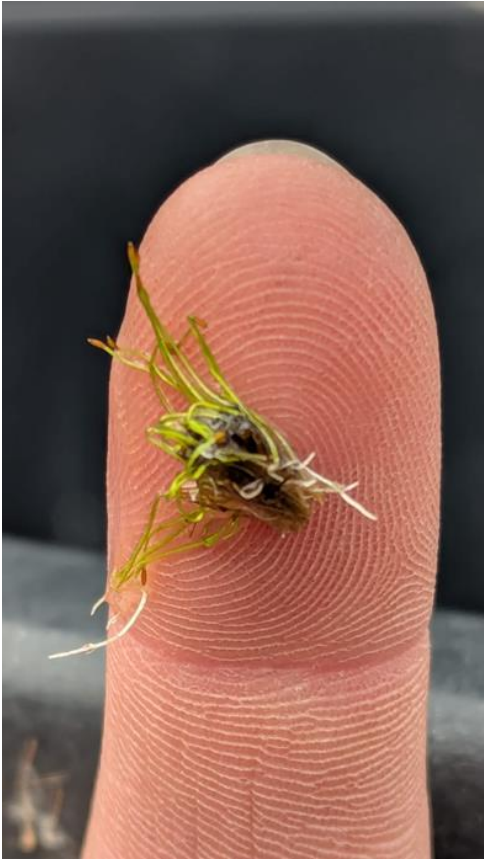
Collaboration and exchanging knowledge; on Both: product and crop level

- **Panelsheet from Friesland get tested by Jade Hochshule and 3N**
- **How to manage Paludiculture?**
- **How to manage Watersystems?**
- **Seeding procedures**
- **Harvesting and fibre processing**
- **Ecosystems, naturebased solutions**

• f



sowing seeds versus planting small plants



Interregional fieldmeeting in Germany;



jährliche Reduzierung um ca. 45 t CO₂-equiv

von Wertschöpfungsketten aus Rohrkolb

Blattmasse weist Eigenschaften für

- hochfestes Kammergerüst
- gefüllt mit porigem Schwamm
- hoher Gerbstoffanteil / hoher pH-Wert
- gut verarbeitbar, ähnlich wie Holz

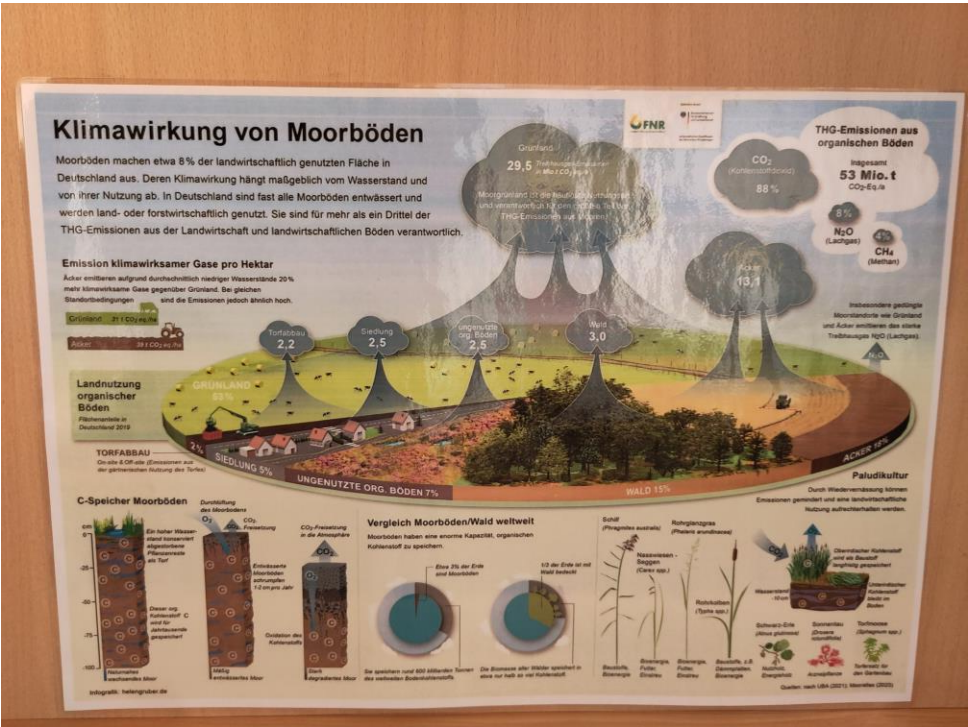
Typhaboard - Dämmstoffplatten

- Wettbewerbsfähig mit konventionellen Produkten
- mineralisches Bindemittel ermöglicht Kompostierung
- geringer Energiebedarf bei der Produktion
- gute mechanische und bauphysikalische Eigenschaften in Kombination

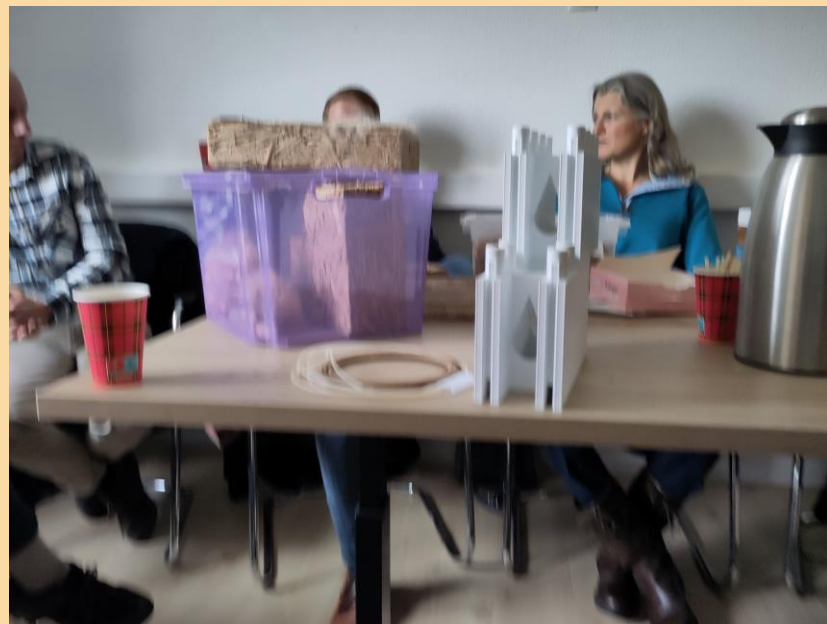
Typhaschüttung - Einblasdämmstoff

- Wärmeleitfähigkeit vergleichbar mit konventionellen Schüttungsdämmstoffen
- erste Brandschutztest unter Zugabe von Ammoniumsulfat zeigen gute Ergebnisse
- geringer Energiebedarf bei der Produktion

Quelle: Fraunhofer



Interregional fieldmeeting in the Netherlands;





2025 september



Proposition

Do you think that with “paludiculture” we can organise a good businessmodel for farmers?



Thank you

