# The agro&envi benefits of growing industrial hemp in Europe


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CzecHemp cluster


State of hemp in Europe / 12. December 2019, Brussel

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# Hana’s intro

- graduated with thesis on industrial hemp use in Czech Republic in 1999
- CEO of Hempoint company since 2010
- Consultant for ICCI and other hemp companies world wide since 2015
- UN lobbyist for Cannabis and Sustainable development since 2017
- Advisory board of EIHA since 2018
- President of CzecHemp cluster since 2018

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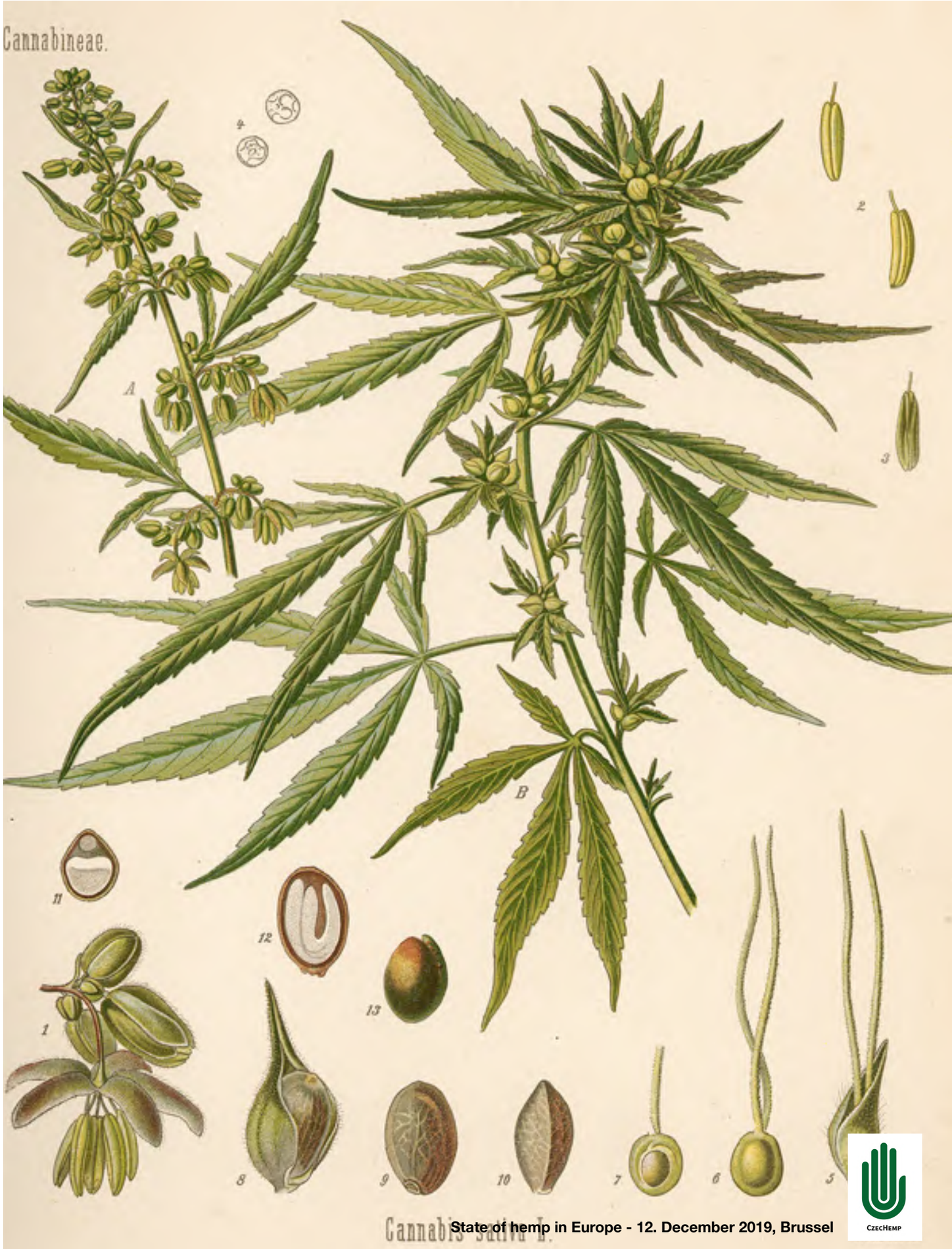
# Objectives

- Brief history of traditional use of hemp in Europe
- Hemp EU research
- Processing of hemp materials
- Versatile uses of hemp
- Benefits of hemp
- SDG and bio-economy
- Summary and next steps



# Brief history of hemp in EU

- 1st paper factory in Jativa (ES) in 12th century
- 15-16th century - ropes and sails for sailing
- 18-19th century - golden era for growers
- 1942 Hemp for victory
- 1961 UN Single convention
- 80's development of first low THC varieties
- A renewed interest in growing hemp in the UK (1993), The Netherlands (1994) and Germany (1996)
- The farmer may only use certified sowing seed of varieties listed in EU regulation 1164/89.
- The EU regulations 1308/70, 619/71 and 1164/89 form the basis of the current subsidy practice for hemp

MultiHemp

## Project information

# MULTIHEMP

**Grant agreement ID: 311849**

Status

**Closed project**

| Start date | End date |
|---|---|
| **1 September 2012** | **28 February 2017** |

Funded under:

**FP7-KBBE**

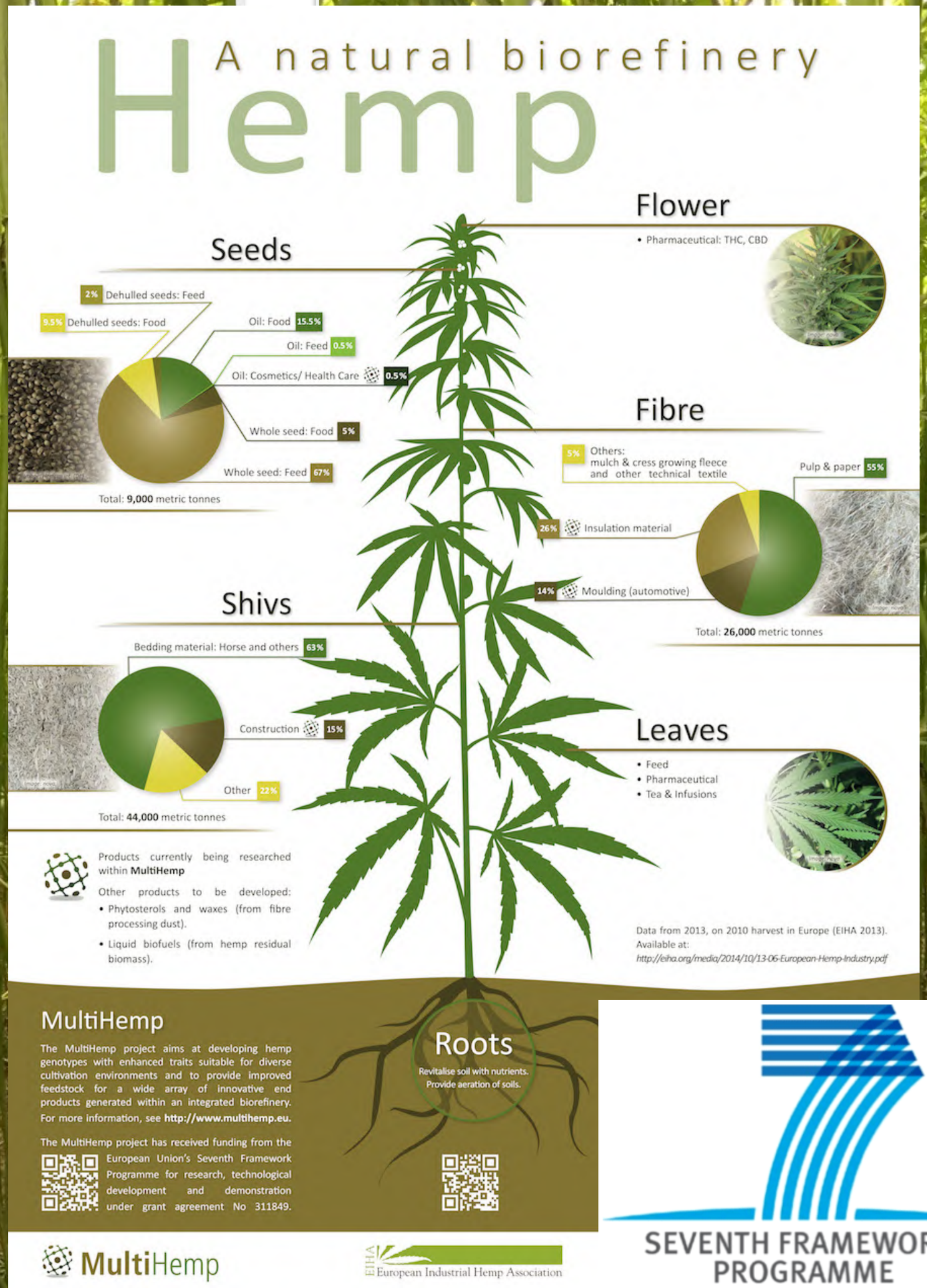
Overall budget:
€ 7 966 093,18

EU contribution
€ 5 999 999

Coordinated by:

**UNIVERSITA CATTOLICA DEL SACRO CUORE**

Italy



# MultiHemp

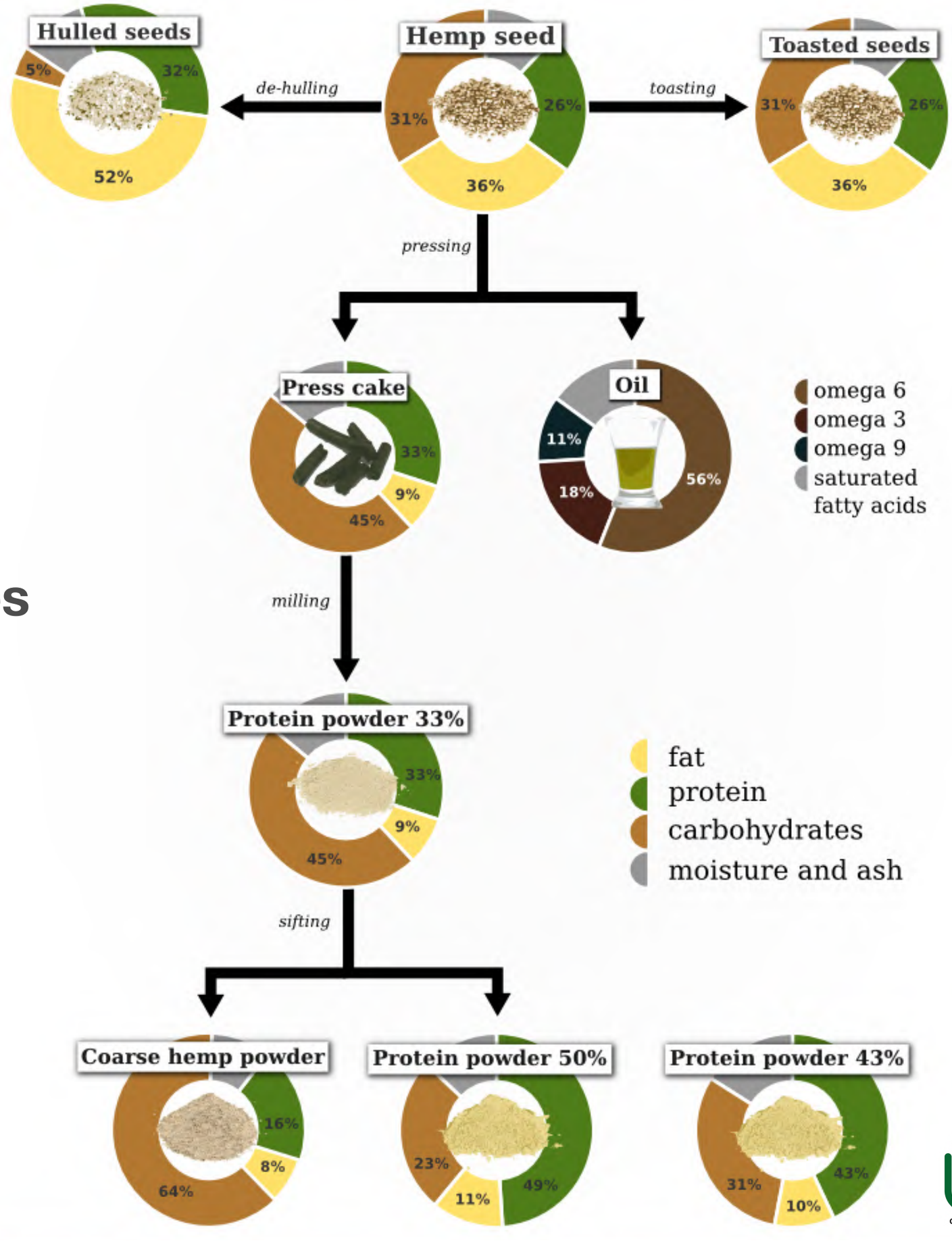
## Multipurpose hemp for industrial bioproducts and biomass

Our ambition is to develop an integrated hemp-based bio-refinery in which improved feedstock is subject to efficient and modular processing steps to provide fibre, oil, construction materials, fine chemicals and biofuels using all components of the harvested biomass, and generating new opportunities within the developing knowledge based bio-economy.

This work will be combined with innovations in agronomy, harvesting and processing methods to generate sustainable products from improved varieties. The economic and environmental implications of each innovation will be assessed so as to maximise economic return and increase sustainability.

# Hemp seeds

- Superfood
- Livestock and fisheries feed
- Cosmetics
- Colorants and oils for technical uses

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# Hemp shives & fiber production

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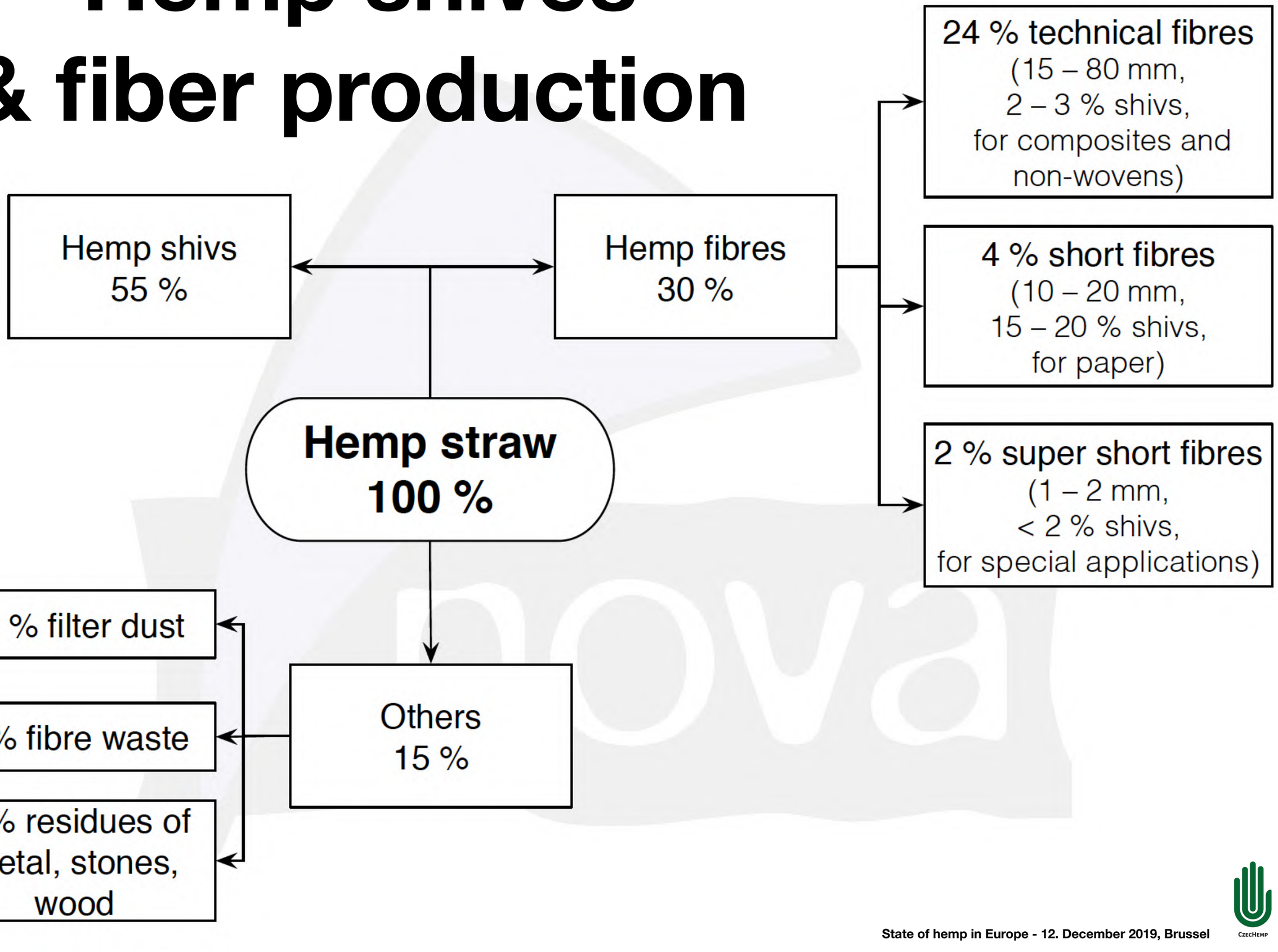


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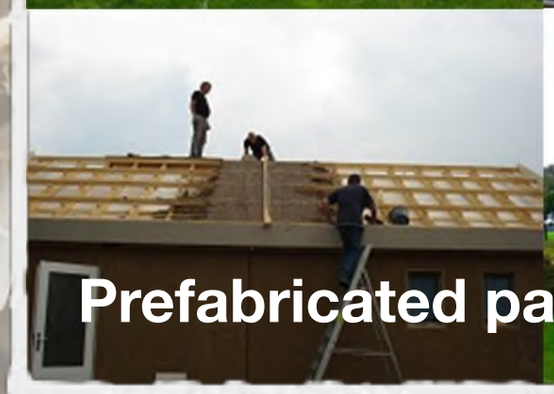
# Hemp plastic

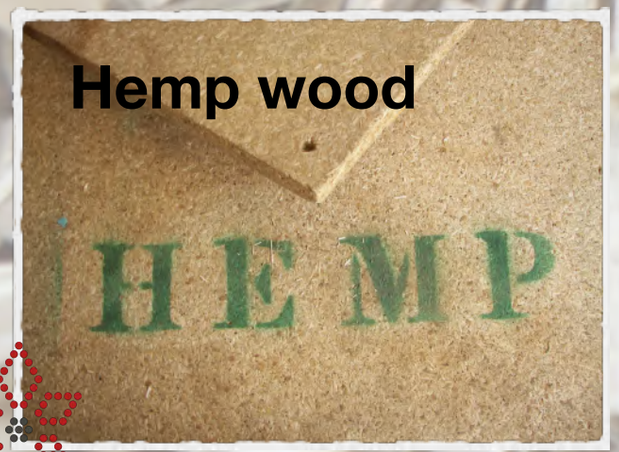



# Hemp building



Prefabricated panels

Briks



Hemp wood

HEMP

Any shape

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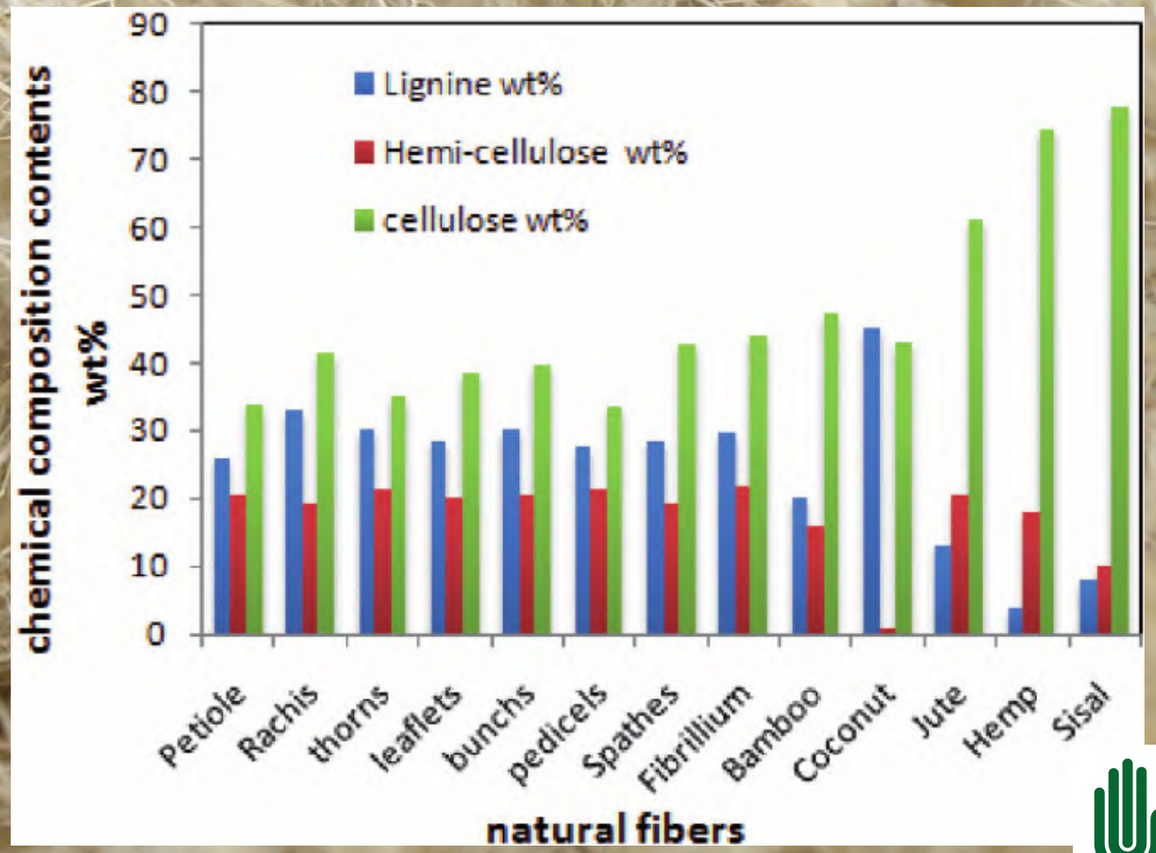
- **Hemcrete** provides wall, insulation and plaster carrier all in one material.
- It's a natural, chemical free substance.
- Hempcrete breathes well, is vapour permeable. In a concrete building when humidity rises, condensation forms on the surfaces as water can't escape through the concrete, which can lead to mould.
- It’s safer for those with environmental allergies or sensitivities.
- It helps to maintain a very consistent internal temperature, without the need of a heater.

- Hemp is extremely fire resistant.
- Hempcrete sequestrates CO2.

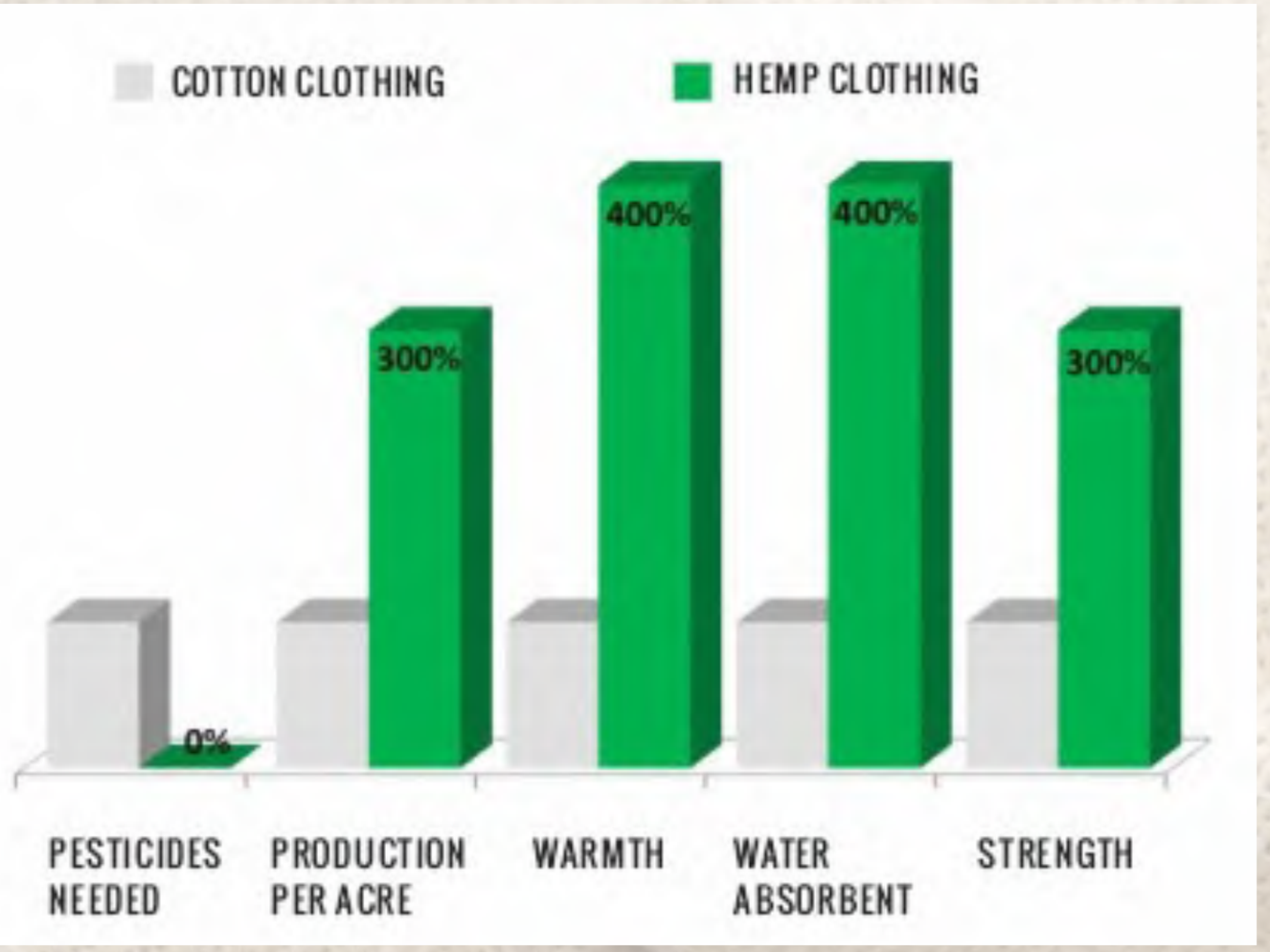
| Material | Embodied carbon by weight* | Embodied carbon for 4x8 foot wall @ R-28** | Carbon footprint after sequestration |
|---|---|---|---|
| Hempcrete | -2.73 $kgCO_2e/kg$ for 300 $kg/m^3$ mix | -121.4 $kgCO_2e$ | -121.4 kg per 4x8 wall area |
| Mineral wool batt | 1.28 $kgCO_2e/kg$ | 21.75 $kgCO_2e$ | 21.75 kg per 4x8 wall area |
| Fiberglass batt | 1.35 $kgCO_2e/kg$ | 17.6 $kgCO_2e$ | 17.6 kg per 4x8 wall area |
| Denim batt | 1.28 $kgCO_2e/kg$ | 22.45 $kgCO_2e$ | -1.5 kg per 4x8 wall area |
| Dense packed cellulose | 0.63 $kgCO_2e/kg$ | 35.3 $kgCO_2e$ | -41.3 kg per 4x8 wall area |
| Extruded polystyrene foam | 3.42 $kgCO_2e/kg$ | 38.5 $kgCO_2e$ | 38.5 kg per 4x8 wall area |
| Expanded polystyrene foam | 3.29 $kgCO_2e/kg$ | 37.25 $kgCO_2e$ | 37.25 kg per 4x8 wall area |
| | * figures from Inventory of Carbon and Energy (ICE) 2.0 | **material densities from *Making Better Buildings* | |

# Hemp paper

- Hemp stalks grow in 4 months, whereas trees take 20-80 years.
- Hemp has lower lignin content than wood. Hemp contains 2-6% lignin whereas wood has 20-30%. This is advantageous as lignin must be removed from the pulp before it can be processed as paper.
- Hemp paper is more durable than trees and can me more time recycled.
- Hemp paper does not yellow, crack, or deteriorate like tree paper.
- Wider use of hemp paper can help sustainability efforts to reduce deforestation.

# Hemp textile




**1. Highly durable**, meaning less consumerism over the long term.

**2. Becomes softer** and more comfortable over time.

**3. Highly breathable:** four times more absorbent than cotton. It wicks moisture away from the skin, keeping you from feeling sweaty and clammy.

**4. Antibacterial properties** might prevent body odor – a major benefit for obvious reasons.

**5. Holds colour**: The absorbent qualities of hemp means that it holds colour better than cotton.

**6. Environmentally friendly**: Hemp grows densely, saving space in cultivation. One acre of hemp can produce 1500 pounds of fiber – three times the amount that cotton produces in the same area. Hemp uses drastically less water than cotton.

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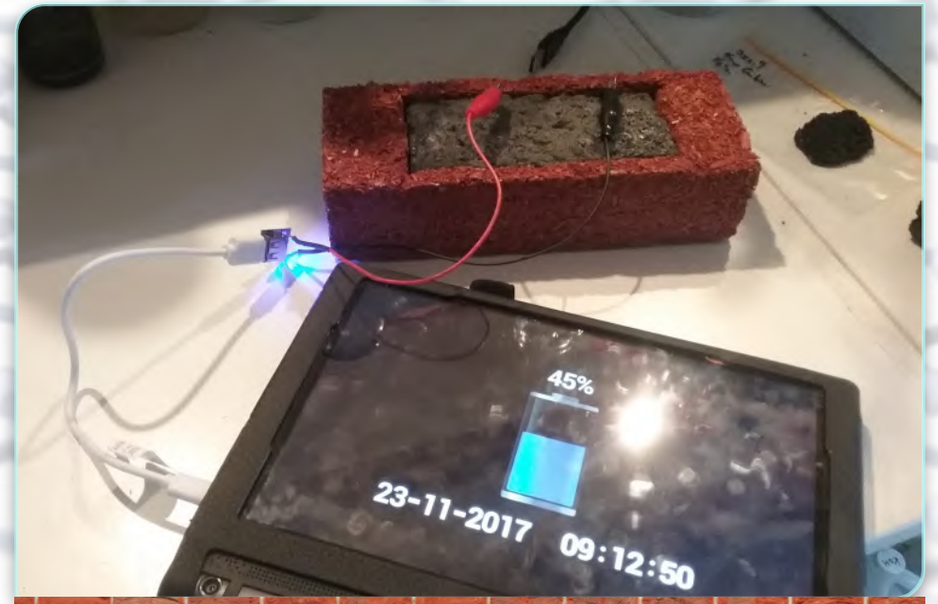
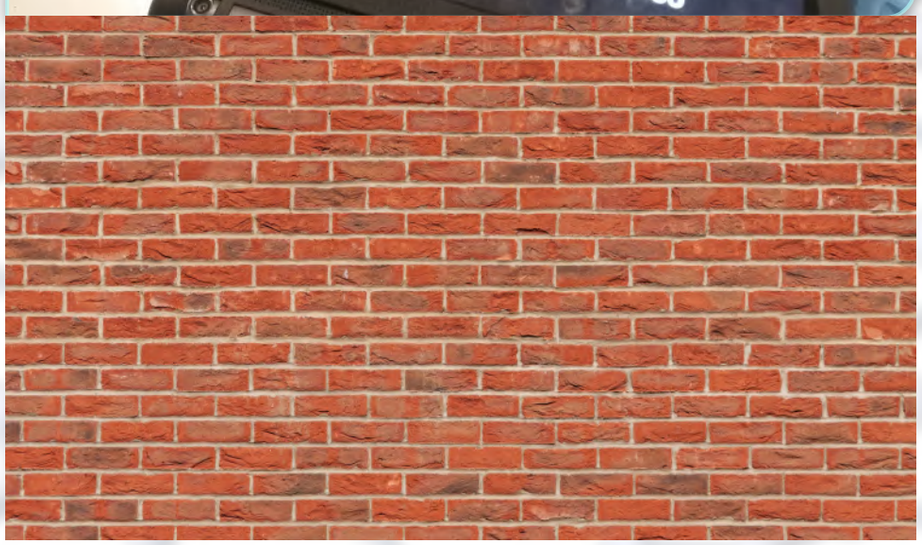
# Supercapacitors

- The type of carbon plays a major role in improving the performance of electrodes used in batteries and fuel cells.
- Plant based carbons via carbonization will play a vital role in future electrochemical technologies.





# Agro & Envi benefits

- **Less Reliance on Pesticides and Herbicides** - due to its quick growth rate, hemp makes an excellent ground cover crop.
- **Helps biodiversity** - hemp plantations can become havens for pollinators (bees love it) as well as small birds and animals.
- **Soil Improvement** - hemp's roots reach deep down into the soil. This both helps to hold the soil together, reducing erosion, and to loosen the soil, allowing more delicate plants to grow afterward.
- **High quantities of biomass** (a matter which returns to the soil and decomposes, feeding nutrients back into the ground) and for this reason, hemp is good grown in rotation with winter cereals, which require high-quality soil.
- **Phytoremediation** - using plants to decontaminate soil after industrial pollution or accidents.
- Needs far **less water** than many other industrial crops, like cotton.
- **Carbon sequestration** - Scientists estimate that for every ton of hemp grown, 1.63 tons of carbon dioxide is removed from the atmosphere, means average 22 tons of CO2/ha
- Grows well in European climate - **historically proven**.

SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD

1 NO POVERTY

2 ZERO HUNGER

3 GOOD HEALTH AND WELL-BEING

4 QUALITY EDUCATION

5 GENDER EQUALITY

6 CLEAN WATER AND SANITATION

7 AFFORDABLE AND CLEAN ENERGY

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

10 REDUCED INEQUALITIES

11 SUSTAINABLE CITIES AND COMMUNITIES

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

14 LIFE BELOW WATER

15 LIFE ON LAND

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

17 PARTNERSHIPS FOR THE GOALS

SUSTAINABLE DEVELOPMENT GOALS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# CANNABIS & SUSTAINABLE DEVELOPMENT

Paving the way for the next decade in *Cannabis* and hemp policy

FAAAT EDITIONS

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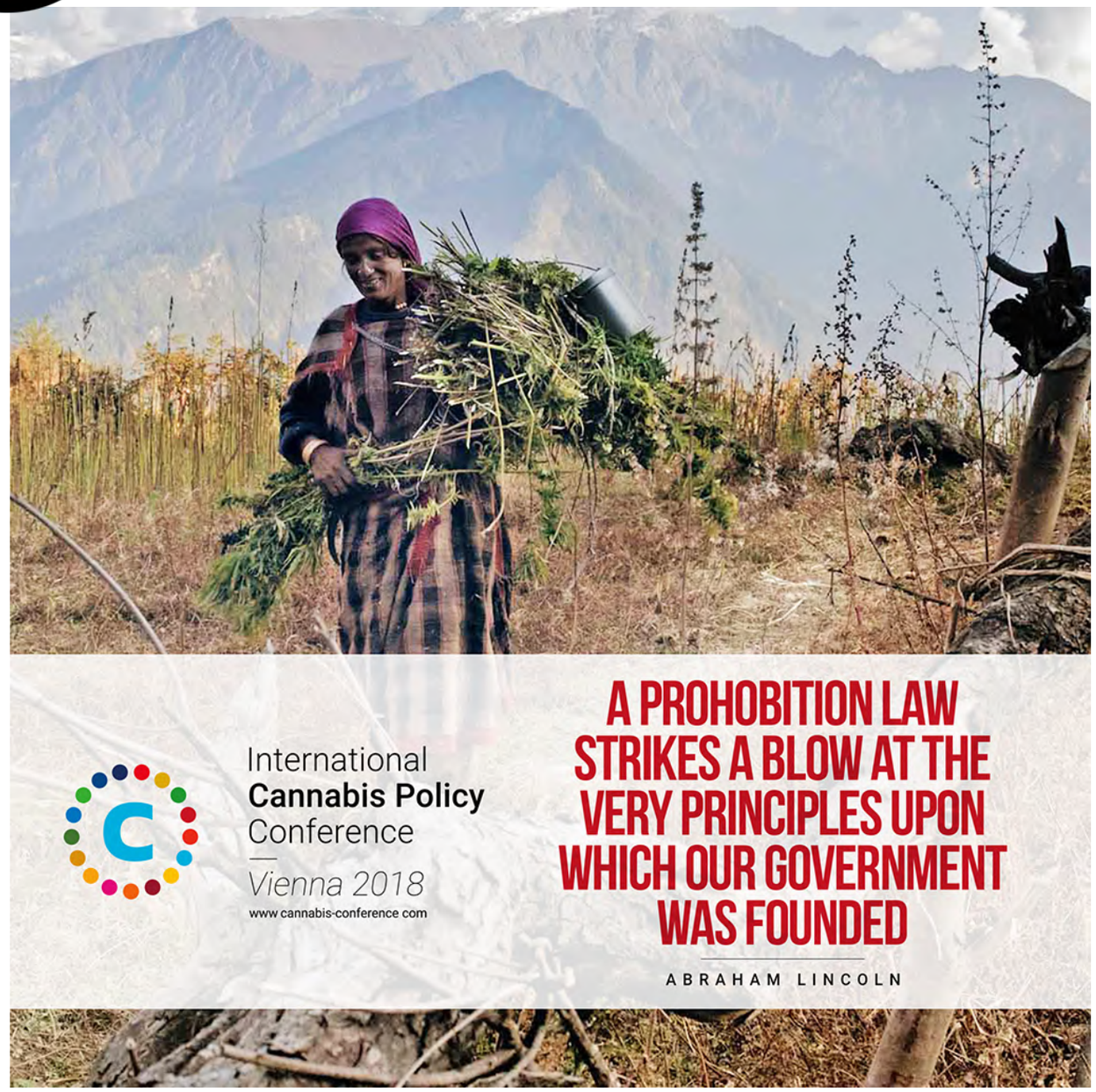


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# EU Bioeconomy strategy 2020+

Bioeconomy is defined as “the production of renewable biological resources and the conversion of these resources and waste streams into value added products, such as food, feed, bio-based products and bioenergy”

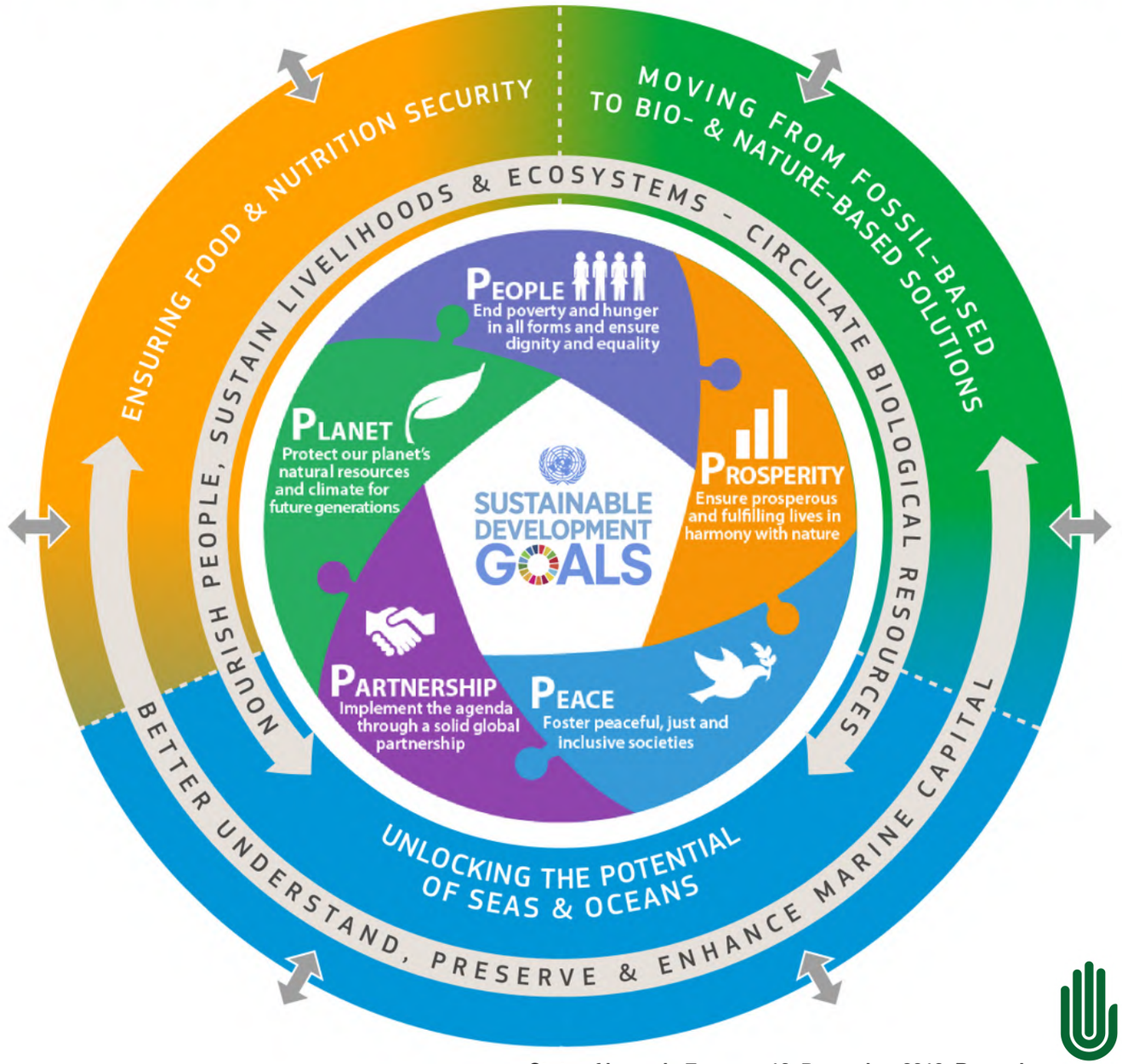
Growing new jobs and industries which have strong innovation potential due to their use of a wide range of sciences, enabling and industrial technologies, along with local and tacit knowledge.

# Circular economy & hemp

Broad scale of exploitability covering different industries:

- free tree paper
- bio-composites & automobile
- natural building
- eco textile
- super food & feed
- phytomedicine

The hemp industry can serve as a demonstration model for the bioeconomy by using all parts of the plant.



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# Summary

Hemp is a traditional agricultural crop can produce renewable materials for multiple industrial purposes to be applied in innovative technologies and processes for the bio-economy.

Hemp contributes to food security, soil cleaning, carbon sequestration, and promotes overall biodiversity which, together with many other social and environmental benefits, makes it an important tool to meet the Sustainable Development Goals and Agenda 2030.

By replacing common products with hemp alternatives, scientists believe we will be able to move towards a more sustainable mode of production and consumption and  it is now considered an ideal crop to produce innovative biomaterials.

Hemp has a potential to diversify the agricultural sector, to empower local economies and act as an agent of ecosystem restoration and soil regeneration.

# Next steps …

**As Europe strives to become the world's first climate neutral continent, developing a hemp positive legislation is essential.**

**To create a stable regulatory environment that will help attract the needed investment into hemp industry infrastructure in order to produce environmentally friendly and high-quality products.**

**Give strong role of hemp in EU Commission strategy for bio-economy.**

**Implementation of hemp as a tool for Sustainable Development Goals and Agenda 2030.**

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Thank You for your attention

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