

Petri Tolonen | [petri.tolonen@ch-bioforce.com](mailto:petri.tolonen@ch-bioforce.com)



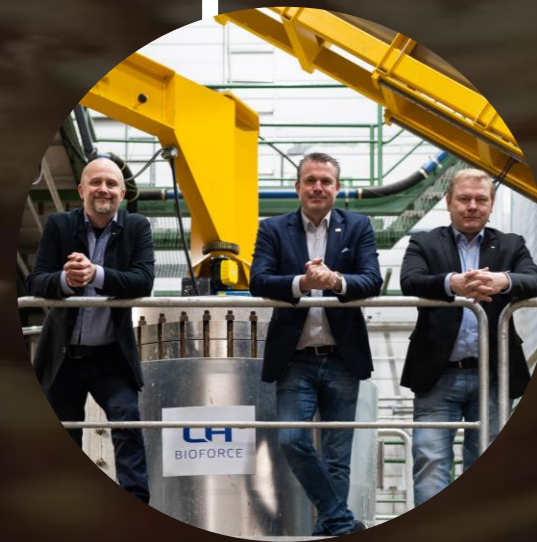
CH-BIOFORCE 2022

**FROM WASTE TO VALUE**

**Biopohjaisten raaka-aineiden jalostus uusiksi tuotteiksi**

**2016**

CH-Bioforce established



**2017**

Small-scale plant in Raisio Finland, capacity 1 ton/batch

Support from Business Finland

**2019**

Construction of automated pilot production line begins



SME 2 funding from the European Union's Horizon 2020 research and innovation program

**2020**

Technology develops and new collaborations and global projects.



**2022**

CHB technology used in real applications

SPINNOVA®



**2025**

**FIRST PLANT** to be commissioned, capacity 20.000 tons/year

**Solution:** Our unique, fully scalable Game-changing Technology

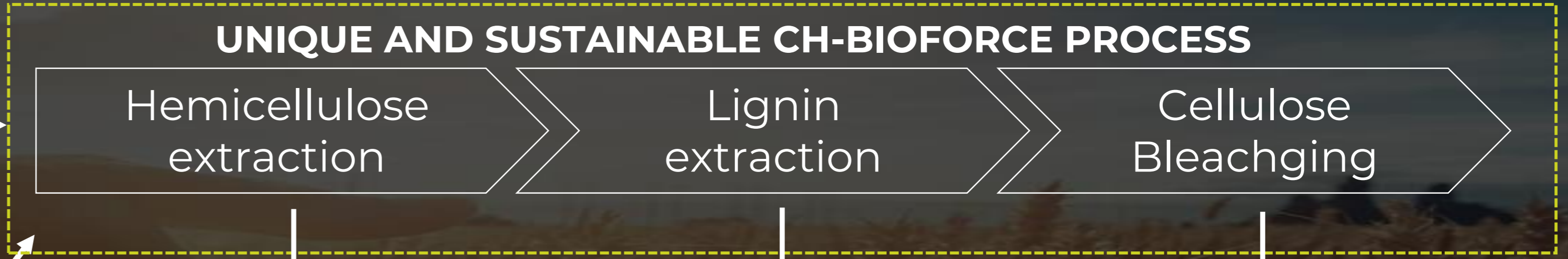
High material efficiency, carbon neutral, sustainable, low operating costs = high-quality products



Raw material from various agricultural or industrial sources



Ultra-low Water Consumption



High-quality Polymeric Hemicellulose for **cosmetics and detergents**

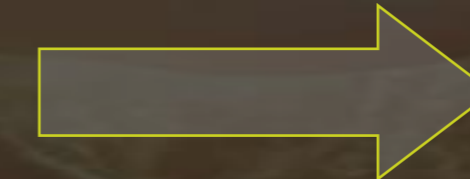
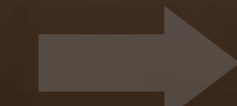
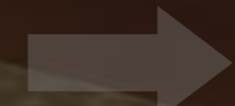


High-quality Sulphur-free Lignin for **industrial gluing and cosmetics**



High-quality cellulose for **textiles** to replace cotton

...and it will  
become  
future  
opportunity...



**SOCIAL IMPACT:**  
Additional income for farmers  
Raw material utilization  
Sustainability  
Low CO<sub>2</sub> emissions

**SUSTAINABLE PROCESS**

- Carbon binding – better for a straw than for a tree
- High material efficiency
- Low water consumption
- Low OPEX
- Highly scalable



**35%**  
Cellulose

**30%**  
Polymeric hemicellulose

**17%**  
Sulphur-Free lignin

Raw material is **collected and sent to utilization** using CH-Bioforce's technology

**...that leads  
eventually to:**

**Cellulose**  
Fabrics  
Textile fibres  
MMCF like  
Viscose  
Rayon  
Medical  
applications

**Hemicellulose**  
Cosmetics  
Detergents  
Binders and glues  
Pharma medical  
Sugars (sweeteners  
biofuels)  
Packaging (barrier  
materials)

**Lignin**  
Polyurethanes  
Carbon fibres  
3D printing filaments  
Graphite and graphene  
Composites

1

A window factory makes frames from wood and some pieces of the wood end up as chips and shavings.

2

The chips and shavings are sent to CH-Bioforce and it is turned to Lignin at a 17% rate.

3

This lignin is sent to the glue producer that makes the glue used in the window factory. The glue is sent to the factory and used in making the windows.



Petri Tolonen | [petri.tolonen@ch-bioforce.com](mailto:petri.tolonen@ch-bioforce.com)

CH-BIOFORCE 2022



**MAKING THE WORLD MORE SUSTAINABLE BY CONVERTING WASTE TO HIGH VALUE.**