

# The leading-edge open access piloting service provider

*KCL accelerates industrial innovation through applied  
R&D, pilot testing, and material expertise in fiber- and  
bio-based technologies*





## Biomaterial processing services



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# Introduction to our Piloting Platform

KCL has a piloting platform where infrastructure, equipment and personnel come together to form unique environment for actually performing processes, testing ideas and innovate. We offer services in multiple scales and cooperation models with our extensive equipment base

## **0-1000 L**

Comprehensive service capability in laboratory and semi-pilot scale

- Projects in specialized mixing, washing, heating, bleaching, chemical modification of fibers, refining, pressurized processing of materials, purification, crushing, extraction..
- Work revolving new biomaterial sources, improvement of fiber properties, new processes and concepts

## **1000-10 000 L**

Industrially relevant equipment for scale up and demonstration of unit operations and processes

- Pressurized digesters, continuous extraction, high-capacity mixers, crushers, liquid/slurry processing equipment, washers, dryers

## **10 000-100 000 L**

Flexible cooperation in contract manufacturing, piloting, demonstrations

It is also possible to integrate your equipment to our infrastructure in any scale

## New opportunities enabled by Business Finland's RRF Biohub in Piloting platform

### Main highlights from Piloting Platform:

#### Equipment

- **9 new pilot scale machines** for piloting to join our vast arsenal of equipment. New extractors, mills, reactors, liquid treatment options and water removal

#### Continuous improvement

- Countless **improvements to existing equipment and infrastructure** enabling wider operation parameters and service potential in mechanical processing, extraction, water removal and liquid processing
- High profile **Master's thesis work** in continuous textile purification with Aalto University leading to one great future professional joining the KCL team

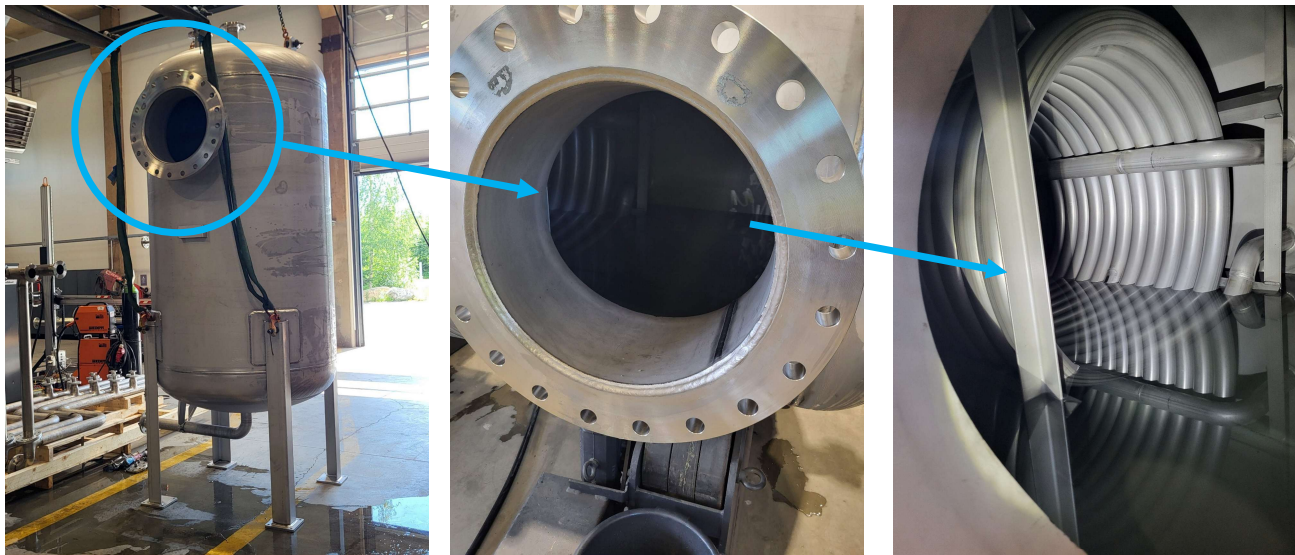
#### Clients

- **3 international conferences** and **seminars** abroad
- New **international clients** and **business regions**

## KCL pilot services – BF-enabled Case New Pressure vessel

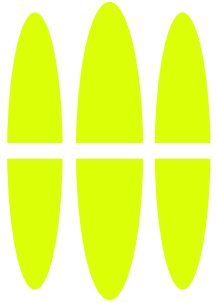
### High-pressure receiver vessel with heat exchanger

- Client has a process where it is important that the liquid behaves in a certain way
- KCL and the client together planned the reactor with Finnish Reactor Company JP-Set who then also built the reactor
- Now the vessel is integrated to the 4 m<sup>3</sup> digester system and is used in the processing of client's material



Powerful heat exchanger inside the vessel for heating or cooling down the contents of the reactor





# Boreal Bioproducts

The forest-based biorefinery company

## Boreal Bioproducts

Upcycles woody side streams into valuable raw materials for the chemical industries in a non-chemical biorefinery.

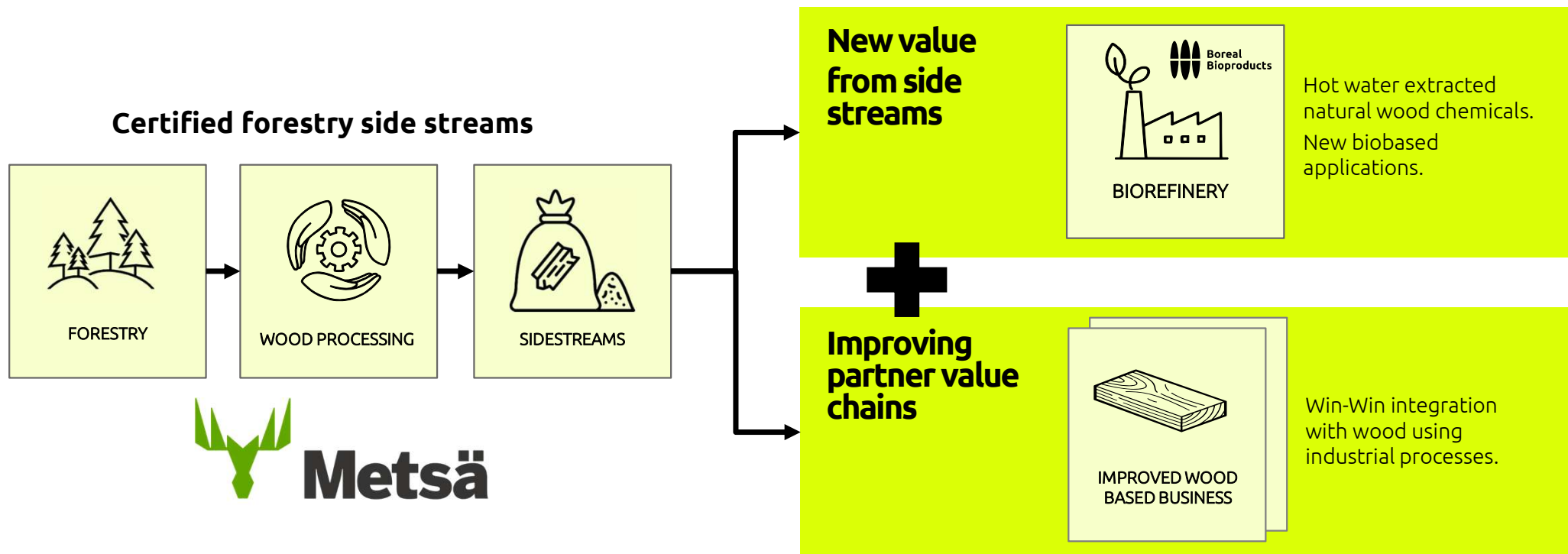
## Our **mission:**

Unleash value from forestry side streams in industrial uses

## Our **vision:**

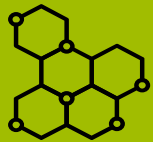
Healthy people and economies, through renewable chemicals

# Boreal boosts the value of woody side streams up to x50 and optimizes existing value chains



# Applications Towards Greener Future

## Chemicals



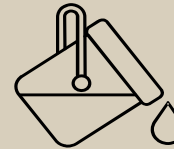
- Binders and adhesives
- Coatings
- Carbon products

## Food and Feed



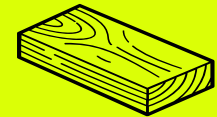
- Prebiotic fibers
- Health beneficials

## Clothing and garment



- Leather production
- Leather protection

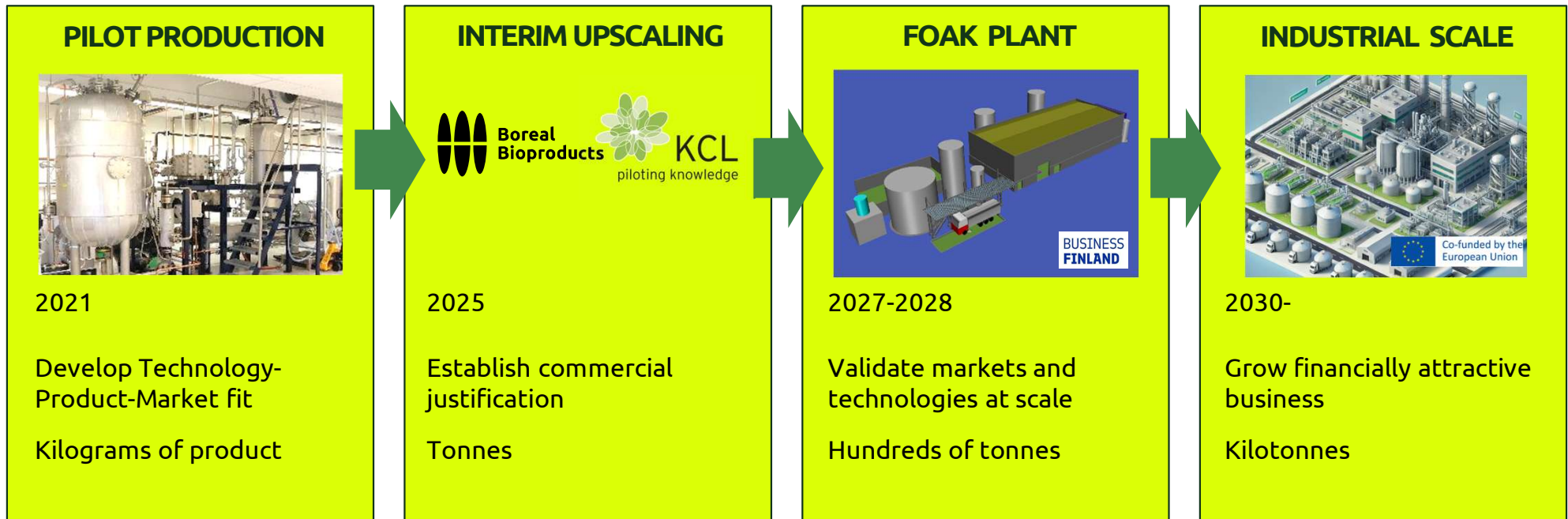
## Wood products



- Boards and panels
- Composites



# Technology at a pilot scale and path for upscaling to industrial scale production





## KCL pilot services – flexible piloting & scale up

### **What do we do?**

- We support innovation by bringing your idea to reality
- We ensure quality and performance by improvement
- We drive sustainability forward

### **How?**

- We offer Experts and Equipment under the same roof
- We bring different parties to the same table and collaborate

We are here for your piloting needs



### **Inquiries**

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