

The logo features a stylized green plant with two leaves growing from a vertical stem that is composed of several horizontal bars of varying lengths, resembling a ladder or a series of steps.

# GRETE

OVERCOMING THE BOTTLENECKS OF  
THE WOOD-TO-TEXTILE VALUE CHAIN



GRETE project has received funding from the Bio-Based Industries Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement No. 837527



Horizon 2020  
European Union Funding  
for Research & Innovation



# PROJECT

## GRETE - GREEN CHEMICALS AND TECHNOLOGIES FOR THE WOOD-TO-TEXTILE VALUE CHAIN

### Project lead

VTT Technical Research Center of Finland

### BBI JU contribution

€ 2,555,243.75

### Duration

01.05.2019 – 30.04.2023

### Type of action

Research & Innovation Action

### Feedstock origin

Forest-based

### Feedstock type

Lignin & wood residues



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### GRETE

Green chemicals and technologies for the wood-to-textile value chain

#### Summary

The GRETE project aims to develop new and better technologies for wood pulp modification, cellulose dissolution and fibre quality generation complying sustainability requirements and market needs.

Currently the raw material base to produce man-made cellulose fibres is limited, as only dissolving grade wood pulps are used commonly. The project will tackle this by widening the sustainable raw material basis for man-made cellulose fibres by including paper grade pulps. In addition, the solvent systems used to produce commercial man-made cellulose fibres are based on toxic and explosive chemicals; the GRETE processing technologies will increase safety, sustainability and feasibility of man-made cellulose fibre manufacturing.

The issues addressed by the project play a significant role in developing sustainable and green technologies for the European industry. The partners of the project are strongly committed to face the challenge and achieve the ambitious results, supported by a dedicated stakeholder group with the aim to foster strategic decision-making.

#### Objectives

#### Impacts

### GRETE

Web site  
<https://www.grateproject.eu/>

#### Results

Project's achievements on the EU research results portal

#### Project details

Type of action:	Research & Innovation Action
Feedstock origin:	Forest-based
Feedstock type:	Lignin & wood residues
Start date:	01 May 2019
End date:	30 April 2023
BBI JU contribution:	€ 2,555,243.75



## AMBITION

### OVERCOMING THE BOTTLENECKS OF THE WOOD-TO-TEXTILE VALUE CHAIN

Tackle the challenges of **sustainable production of cellulose-based man-made fibres** by developing innovative technologies for wood pulp modification, cellulose dissolution and fibre generation, thus radically improving the wood-to-textile value chain.



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# CONSORTIUM

EXCELLENCE CONNECTING  
EUROPE'S NORTH TO THE  
SOUTH

The GRETE project is implemented by a consortium of a total of **eight partners**, connecting **five countries** from Europe's North to the South: Finland, Austria, Italy, Spain and Portugal, bringing together institutions from **Research, Consultancy and Industry**.



2 RTO



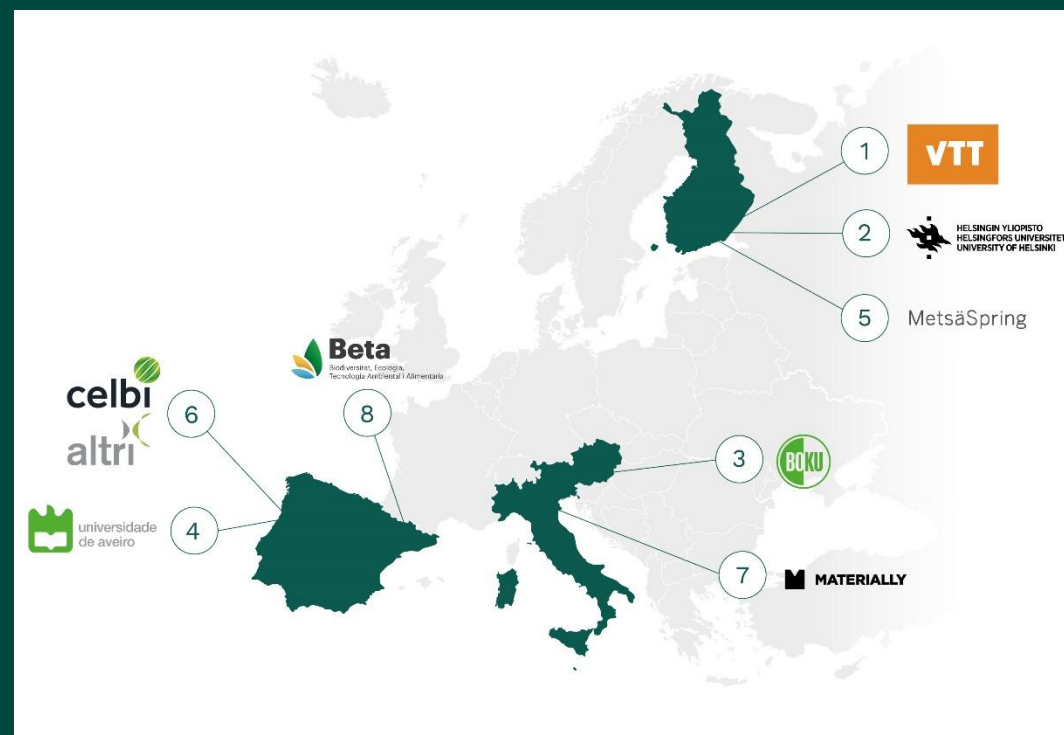
3 HEIs



1 SME



2 Large  
Companies

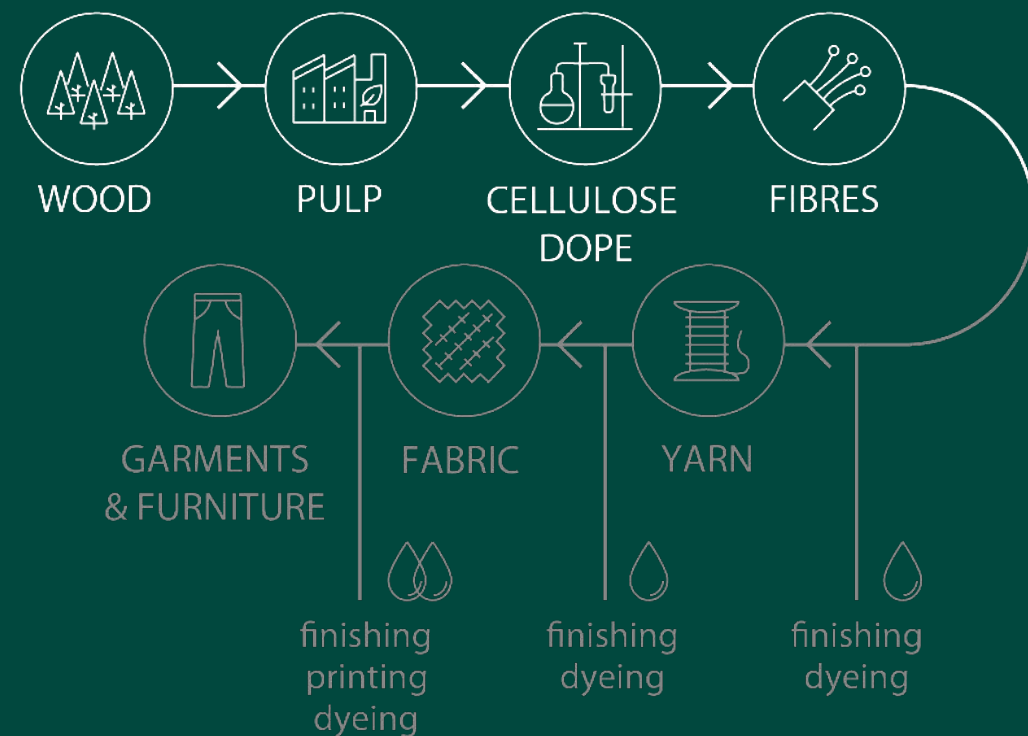


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## IMPROVING THE EXISTING TEXTILE VALUE CHAIN THROUGH TECHNOLOGICAL INNOVATION

Using a **new raw material** based on European paper grade pulps, implementing **novel solvent systems** based on ionic liquids, and feasible and sustainable modification procedures for **cellulose** dissolution and **regeneration**.



GRETE will radically improve the wood-to-textile value chain by developing sustainable technologies for production of high-quality cellulose-based textile fibres

**Broader raw material base by using paper-grade pulp**

- Resource efficiency
- Reduction of chemical consumption
- Positive economical impact

**Developing enzymatic and chemical pulp modifications and novel solvents** based on ionic liquids

- Offers possibility to use European paper-grade pulps
- Current solvents are either environmentally hazardous or explosive

Developing sustainable **fibre modification** processes

- durable high-quality fibres
- targeted and water-scarce finishing treatments and dyeing





## OUTCOMES

**Reducing the carbon footprint** of a finished textile garment product by approximately 40% and develop water and chemical scarce finishing processes

Developing **sustainable and competitive bio-based industries** in Europe

Improving technological performance of existing biorefining operations and **reducing biorefineries' capital and operating costs**

**Societal impact also outside the EU:** release of land for food production (now used for cotton farming), reduction of water and pesticide consumption (both being environmental detriments of cotton production)



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## LOCAL IMPACTS

**Create new jobs** and offer working opportunities in **less populated rural areas** of the EU

Forest-based industries **provides income to around 16 million forest owners** in the EU and help maintain employment and wealth generation in rural areas

Possibility to use **forest-based raw materials free from herbicides and insecticides**



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## CONTRIBUTION TO EU POLICY

Support **growth and re-industrialization** in Europe

Strengthen the **links between science and policy-makers** removing unnecessary regulatory barriers.

Assist industry to further explore promising technologies to **broaden and strengthen the bio-based industries** in Europe simultaneously reducing the environmental footprint of the total value chain.

Help to answer grand challenges established in the **European Bioeconomy 2030** including sustainable management of natural resources, sustainable production, improving public health, mitigating climate change, integrating and balancing social developments, and sustainable development.



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# INTERIM RESULTS

## R&D WORK ON TRACK

Several thesis workers are documenting the research work carried out within GRETE, such as the paper grade Kraft **pulp modifications**, the analysis of **solvent recovery** concepts and the spinning of the first batch of **GRETE fibres**, which are now tested.



NOVEL RAW  
MATERIAL BASE  
FOR THE TEXTILE  
INDUSTRY



NOVEL  
SOLVENTS FOR  
CELLULOSE  
DISSOLUTION &  
REGENERATION



HIGH QUALITY  
FIBRES WITH  
TAILORED  
PROPERTIES

Download the GRETE related scientific publications [here](#).



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*Thank you!*

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