ECOSYSTEX

ECOSYSTEX Insights Series #7 Webinar

Focus: Biobased materials projects

9 February 2024

Co-funded by the European Union

ECOSYSTEX

ECOSYSTEX Insights Series #7

9 February 2024 • 10.00 - 11.30 CET

Introduction
Tilla Kross
Textile ETP
10:00-10:10

Presentation of announced circular & bio-based textiles topics
Simone Maccaferri
CBE-JU (EU)
10:10-10:20

FIBSUN: Novel fibre value chains and ecosystem services from sustainable feedstocks
Kristiina Lång
Luke (FI)
FIBSUN Consortium
10:20-10:35

Bio-LUSH: Innovating biomass conversion to nano-fibers for eco-friendly materials
Alexey Khakalo
VTT (FI)
Bio-LUSH Consortium
10:35-10:50

Glaukos' project achievements on biobased coatings
Koen Van Goethem
I-Coats (BE)
Glaukos Consortium
10:50-11:05

Q&A
11:05-11:20

Wrap-up
Tilla Kross
Textile ETP
11:20-11:30

European Community of Practice for a Sustainable Textile Ecosystem

Objectives of ECOSYSTEX

Interproject collaboration

- Foster interproject collaboration by sharing best practices
- Exchanging/creating new knowledge to advance sustainable and circular business practices

Engagement with policymakers

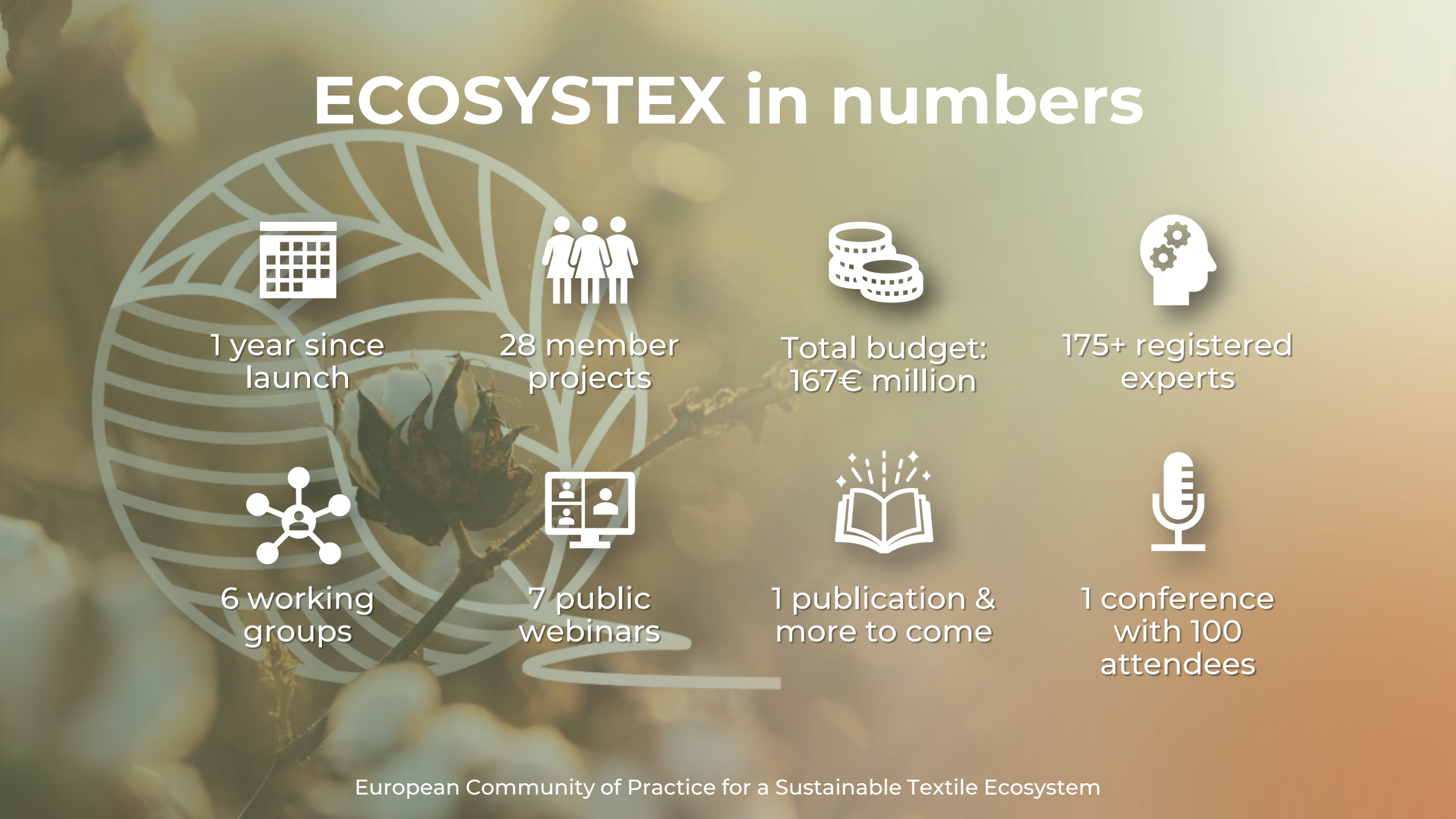
- Engage with policymakers and public programme managers
- Help them design effective policies and programmes to foster textile circularity and sustainability
- Support their implementation

Dissemination

- Ensure the interested public expert community can be informed about latest developments and results of EU research and innovation projects

... with the goal to create a long-term community of practice and becoming the central European knowledge hub

ECOSYSTEX in numbers



1 year since launch

28 member projects

Total budget: 167€ million

175+ registered experts

6 working groups

7 public webinars

1 publication & more to come

1 conference with 100 attendees

European Community of Practice for a Sustainable Textile Ecosystem

European Community of Practice for a Sustainable Textile Ecosystem

Circular Bio-based Europe Joint Undertaking

CBE JU opportunities in the circular & biobased textile sector

Simone Maccaferri

ECOSYSTEX Insight Series, 09 /02/24

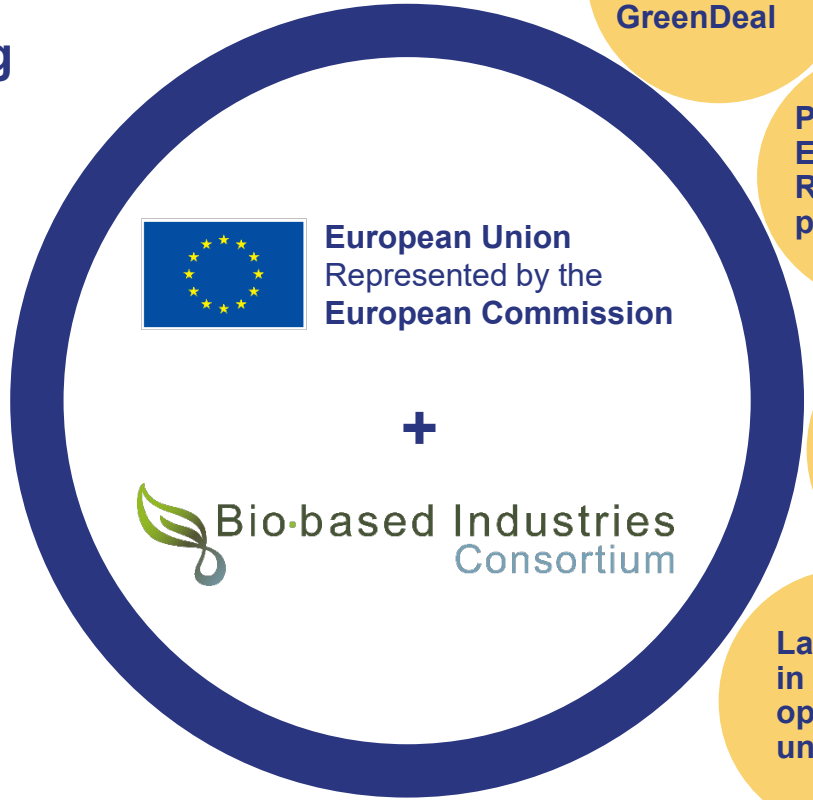
Bio-based Industries Consortium

Co-funded by the European Union

Circular Bio-based Europe Joint Undertaking

€2 billion public-private initiative

CBE JU is funding projects that deliver bio-based solutions – materials and products made from waste and biomass – in an innovative, sustainable and circular way



Contributing to the European GreenDeal

Part of Horizon Europe, the EU R&I funding programme

Building on the success of its predecessor BBI JU

Launched in 2021, operates until 2031

CBE JU projects relevant for textiles (1/2)

RIA = TRL 4/5

GRETE

NeoCel

Bio-LUSH

Glaukos

FIBSUN

CBE JU projects relevant for textiles (2/2)

DEMO = TRL 6/7

BioMotive

effective

UNLOCK

Circular Bio-based Europe Joint Undertaking

2024 CBE JU funding priorities announced

- HORIZON-JU-CBE-2024-IAFlag-03: Bio-based value chains for valorisation of sustainable natural fibre feedstock
- HORIZON-JU-CBE-2024-IA-01: Bio-based materials and products for biodegradable in soil applications
- HORIZON-JU-CBE-2024-RIA-02: Biotech routes to obtain bio-based chemicals/materials replacing animal-derived ones
- HORIZON-JU-CBE-2024-RIA-04: SSbD bio-based coating materials for applications under demanding and/or extreme conditions

Circular Bio-based Europe Joint Undertaking

HORIZON-JU-CBE-2024-IAFlag-03: Bio-based value chains for valorisation of sustainable natural fibre feedstock

End TRL: 8 Budget: 20 m€

- Implementation of (environmentally and economically) sound value chains for biorefinery applications based on sustainable bio-based fibre feedstock
- Establishment of industrial fibre crop production systems from primary non-woody crops and/or wood-based fibres or respective residues and side streams
- Demonstrate innovative biorefinery processes to convert fibre feedstock into SSbD bio-based materials and products. The scope includes **garment applications**, **technical textiles**, composites, **nonwovens**, fibre-based packaging among others.

HORIZON-JU-CBE-2024-IA-01: Bio-based materials and products for biodegradable in soil applications

End TRL: 7/8 Budget: 15 m€ (2 projects)

- Demonstrate and deploy innovative production processes for SSbD bio-based products for biodegradable -in- soil applications, addressing the problem of (micro)plastics release in soil and their further dispersion in runoff water.
- Among other, the topic could focus on **geotextiles**

Circular Bio-based Europe Joint Undertaking

HORIZON-JU-CBE-2024-RIA-02: Biotech routes to obtain bio-based chemicals/materials replacing animal-derived ones

End TRL: 4/5 Budget: 7 m€ (2 projects funded)

- Develop biotech routes for sustainable bio-based alternatives to (a set of) animal-derived product(s). Define, develop and test the related biotech routes and subsequent downstream (separation, purification) up to pilot scale (TRL 5)
- Example of target industries are cosmetics, ingredients, **textile, leather,** chemical

HORIZON-JU-CBE-2024-RIA-04: SSbD bio-based coating materials for applications under demanding and/or extreme conditions

End TRL: 4/5 Budget: 7 m€ (2 projects funded)

- Develop innovative and efficient processes to obtain SSbD bio-based alternative(s) to (a set of) conventional coating(s) for applications under demanding and/or extreme conditions
- Address the end-of-life of the targeted final product(s), ensuring that the bio-based coating is not hindering the circularity of the final product(s)
- Example of target industries are transport, construction, processing industry, **textiles**, energy, electronics, telecommunications, water and waste management

Circular Bio-based Europe Joint Undertaking

CBE JU Info Day 2024

In-person

Dates

23 April 2024

Location

Brussels, Belgium

Organiser

CBE JU

CBE JU Info Day 2024 allows you to gain insights into the upcoming call for project proposals 2024 and expand your network.

Networking opportunities will enable you to engage with other CBE JU community members.

The event will take place in the Charlemagne building in Brussels.

The registration link will be available middle of February.

Circular Bio-based Europe Joint Undertaking

Contact us

info@cbe.europa.eu
www.cbe.europa.eu

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Bio-based Industries Consortium

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FIBSUN

Novel fibre value chains and ecosystem services from sustainable feedstocks

ECOSYSTEX Insights Series

9.2.2024

Kristiina Lång

Circular Bio-based Europe Joint Undertaking

Bio-based Industries Consortium

Co-funded by the European Union

Novel fibre value chains & ecosystem services from sustainable feedstocks

- Consortium of 17 partners led by Natural Resources Institute Finland
- Use of hemp, wood, cardoon, cattail and common reed as feedstock
- Optimization of processing technologies: physical, chemical and biotechnological treatments to obtain competitive fibre products
- Insulation rolls and boards, composites for cars, bioconcrete and textile yarn
- Facilitate provision of sustainable feedstocks for industries and create new valorisation value chains while protecting and restoring degraded soils and biodiversity

Novel fibre value chains & ecosystem services from sustainable feedstocks

CBE JU contribution: € 4.49 million

Duration: June 2023 – May 2027

Feedstock: Hemp, wood, cardoon, cattail and common reed

Main products: Fiber-based products: insulation rolls and boards, composites for cars, bioconcrete and yarn

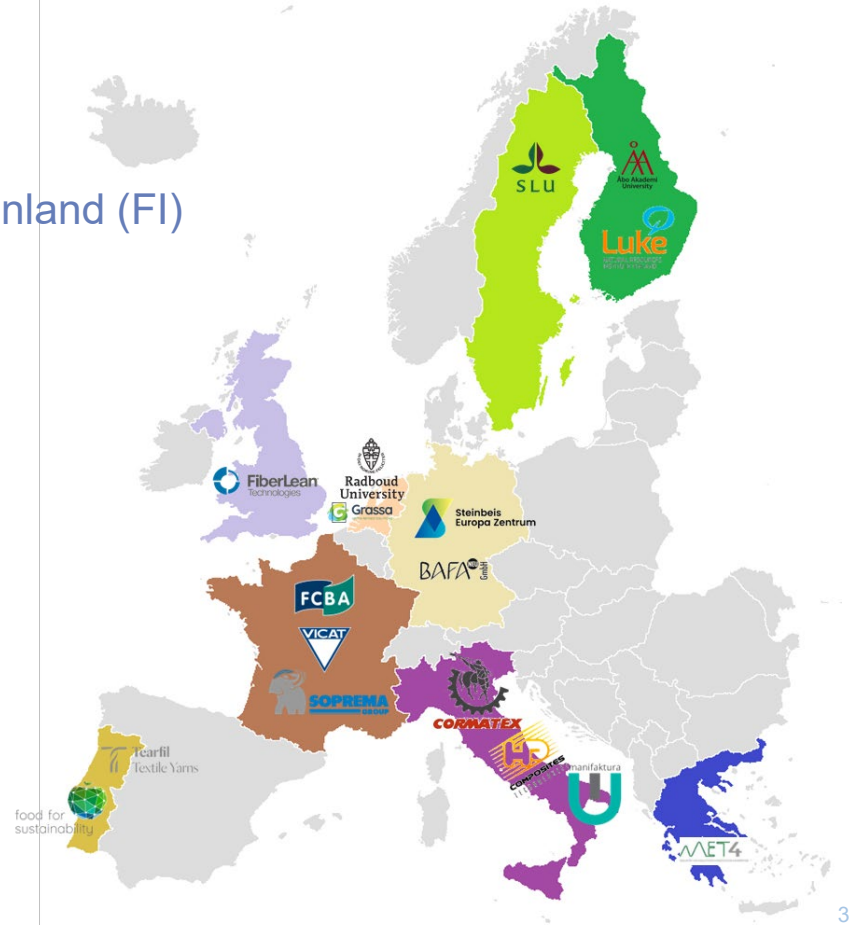
FIBSUN aims to support the development of resilient and competitive production systems and enhanced provision of ecosystem services from degraded soils through five sustainable fibre value chains for construction, automotive and textile sectors.

Project lead: Natural Resources Institute Finland (FI)

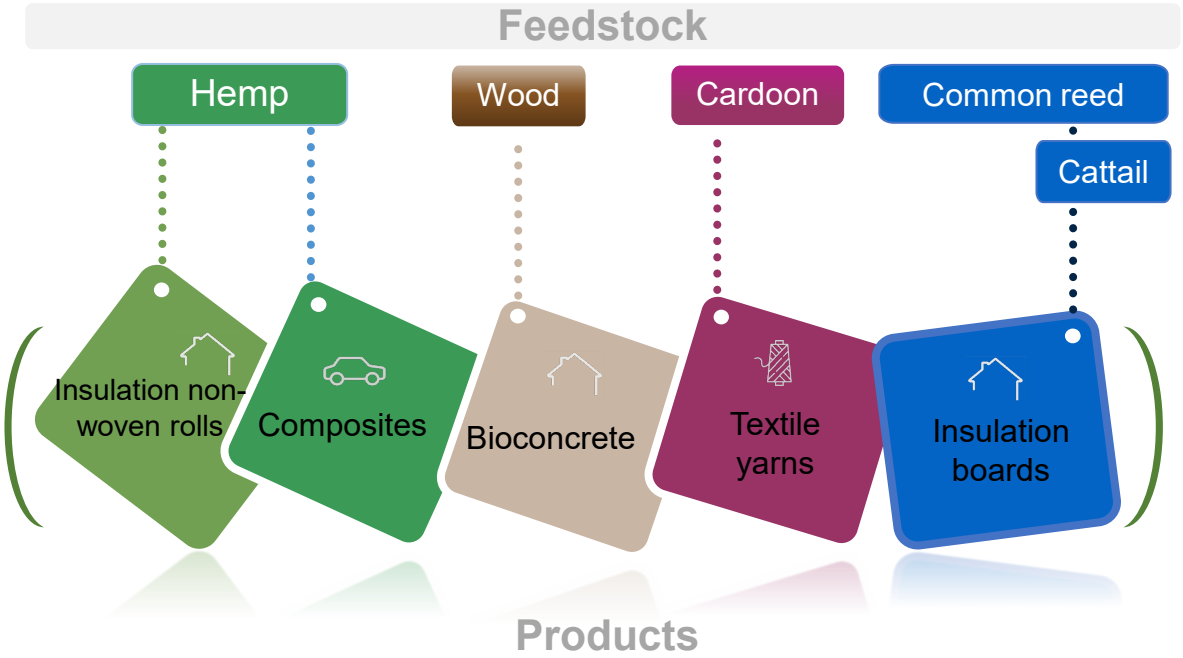
[7] RTOs

[7] SMEs

[3] Large Companies

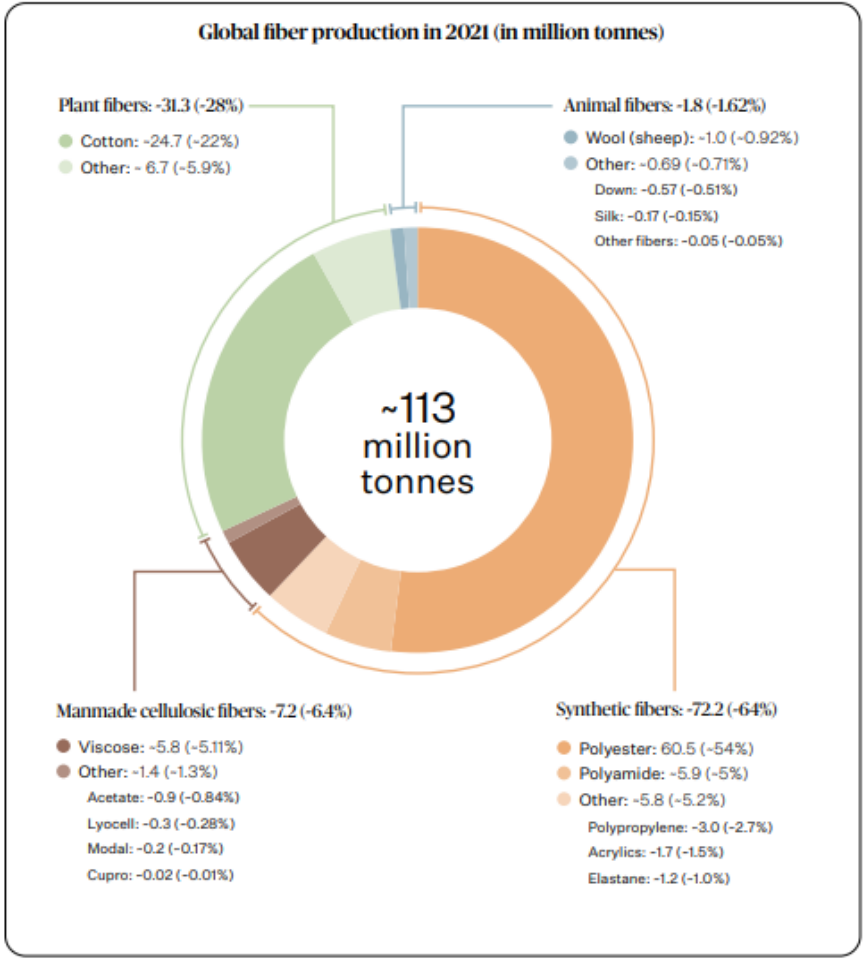


The FIBSUN concept



There is room for novel fibres?

Main fibres in textile industry are synthetic (64%) and cotton (22%); both cause environmental problems.



Cardoon (*Cynara cardunculus*)

- Perennial, height >2 m
- Edible
- Favoured by pollinators
- Used in soil improvement:
- “Cardoon produces a dense mat of fine roots that can contribute to increase soil cohesion, thus providing important ecosystem services.” https://doi.org/10.1016/j.catena.2022.106016
- “*C. cardunculus* and municipal waste can be effective resources for the aided phytoremediation of multi PTE-contaminated soils.” https://link.springer.com/article/10.1007/s11356-020-10687-2

Fibre quality of cardoon

Cardoon fibers, derived from the cardoon plant (*Cynara* spp.), possess several qualities that make them useful for various applications:

Strength: Cardoon fibers are known for their strength and durability. They have good tensile strength, making them suitable for applications where strength is required.

Flexibility: Despite their strength, cardoon fibers can also be flexible, allowing them to be woven or blended with other materials to create textiles or composite materials with desired properties.

Lightweight: Cardoon fibers are relatively lightweight, which can be advantageous in applications where weight is a concern, such as in automotive.

Biodegradability: Cardoon fibers are biodegradable, making them environmentally friendly compared to synthetic fibers. They can be composted at the end of their lifecycle, reducing environmental impact.

Availability: Cardoon is a fast-growing plant and can be cultivated in various regions, making the fibers relatively accessible compared to some other natural fibers.

Value chain for cardoon/processing of cardoon

Cardoon production

- Farming
- Cardoon harvest
- Separation part plants

Processing of plants

- Drying
- Mechanical decortication
- Re-wetting
- Drying
- Fibers characterisation

Development of textile yarns

- Fiber processing
- Yarn processing

food for sustainability

Tearfil Textile Yarns

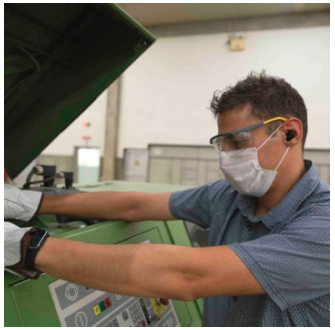
Tearfil Textile Yarns

"Sustainability is an inbuilt mindset and culture for our company."

Tearfil is a short staple, cotton type spinning mill founded in **1973**. Initially we used classic ring and open end systems, but in **1987** a high quality fine yarn spinning mill was installed.

In **2000** as part of our company policy on innovation, a spinning laboratory was created, directed to the research and development of new products.

Since **2019**, Tearfil is working independently again under the management of Belém Machado, a private investor with a family background in the spinning business.



What can you make from cardoon?

Answer by ChatGPT

FIBSUN

Contact us

Kristiina Lång (coordinator)
LUKE
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Follow us

Circular Bio-based Europe Joint Undertaking

Bio-based Industries Consortium

Co-funded by the European Union

Bio-LUSH

BIOMASS VALORIZATION FOR SUSTAINABLE AND HIGH-QUALITY FIBER MATERIALS

CBE JU contribution: €4,479,506.25

Duration: May 2023 – April 2027

Feedstock: hemp, forest residues and other green underexplored biomass feedstocks (nettle and seagrasses)

Main products: edible packaging, antibacterial textiles, and impact-resistant car interior products

The Bio-LUSH project aims to demonstrate a reliable value chain that exploits the cell wall structure of underexplored plant resources in Europe, such as forest residues, marine plants and weeds, to extract high-quality fibers. By combining plant selection, traditional breeding, efficient valorization routes, and advanced fiber characterization, the project ensures the production of high-value fibers with short-term market potential. These fibers are directed towards sustainable bio-based products such as textiles, food packaging, and reinforced composites. The project contributes to retaining the value of the EU's fibrous biomass and promoting the growth of the European fibrous bio-economy, revitalizing marginal and rural areas affected by desertification or socio-economic difficulties. The extended and circular use of plant biomass also contributes to decarbonization and reduced eutrophication.

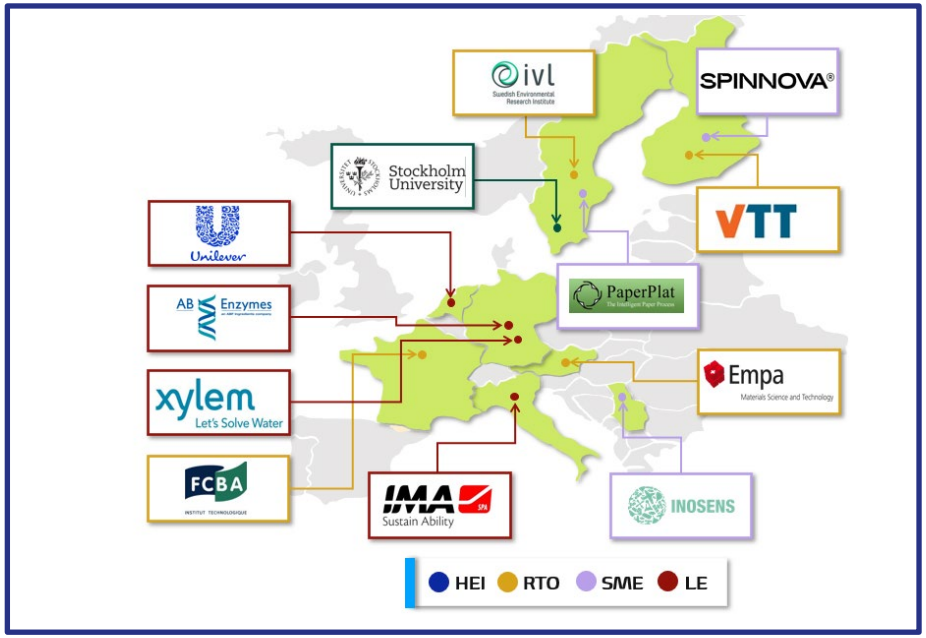
Bio-LUSH

Project lead: Stockholm University

5 RTO's

3 SME's

4 Large Companies



Bio-LUSH

Context and objectives

Challenges

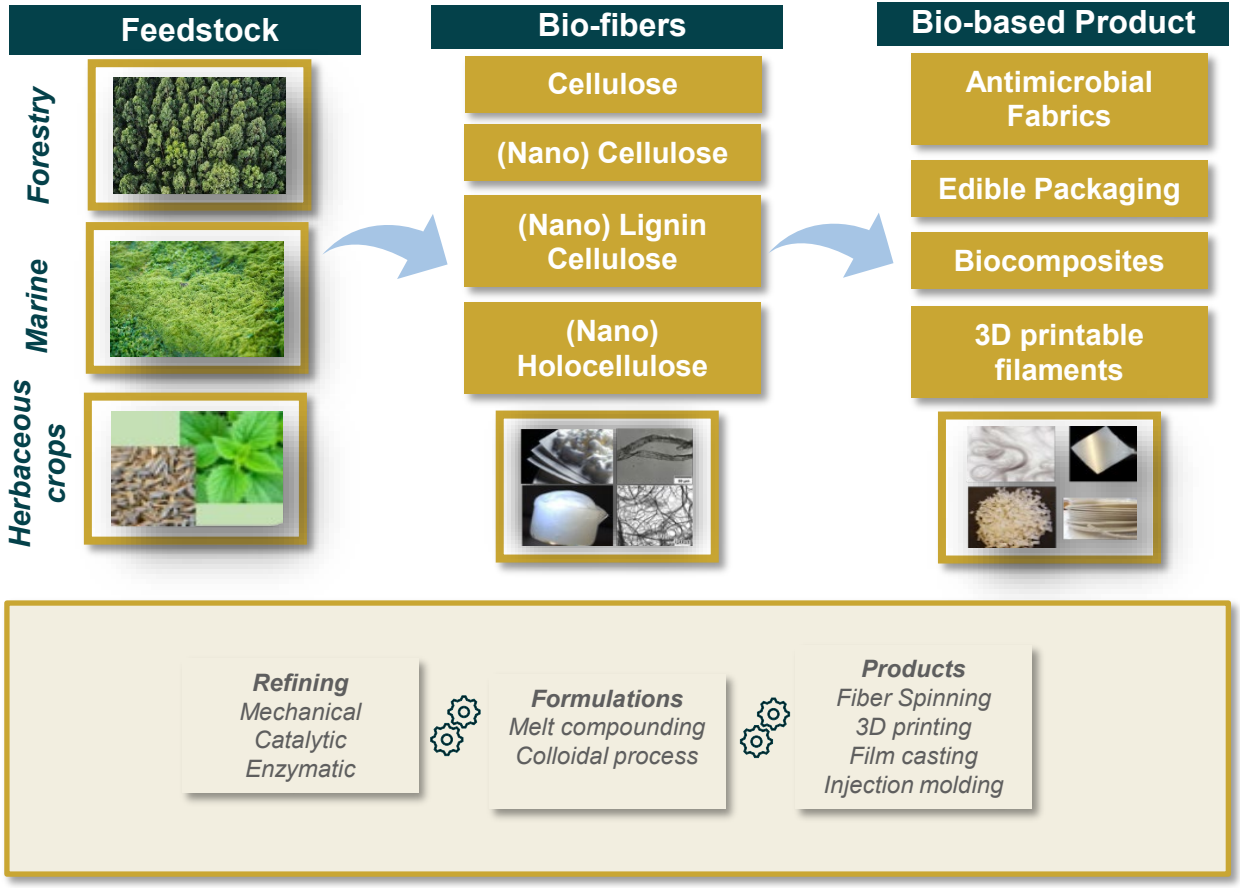
- **Sustainable biomass supply:** Reliable, homogeneous biomass in sufficient quantities without competing with agriculture and forestry, and standardized data on fibers from under-utilized biomass sources.
- **Processing and application gaps:** Green, scalable processing methods for distributed biomass feedstock and its products, and assurance of circular design for biofiber-based products in terms of decarbonization and reduced eutrophication.

Objectives

- **Develop a flexible, "green/clean" process for converting high-value biomass from secondary sources**, reducing environmental impact.
- **Demonstrate market entry potential for high-quality fibers** in textile, food packaging and composites, promoting sustainable bio-based products.
- **Quantify the reduction in reliance on fossil resources** in European manufacturing and engage stakeholders in the transition to a bio-fibrous economy.

Bio-LUSH

The Bio-LUSH concept



Bio-LUSH

Benefits to society and the environment

Enhancing European bio-based sector competitiveness through **sustainable feedstock processing** for fashion, packaging, and automotive applications.

Utilizing bio-based fibers in composites **reduces greenhouse gas emissions**, offsets fossil fuel use, and enables carbon stocking in long-lasting products with negative net emissions.

Decreasing CO_2 emissions, improving policies and decision-making, **raising consumer awareness**, and influencing EU policies and action plans.

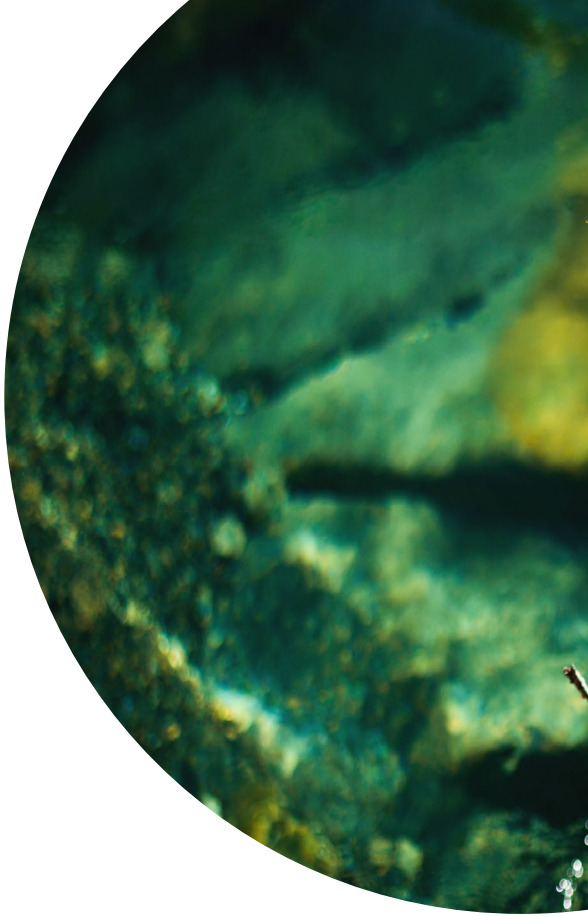
Introducing **new products and processes**, increasing efficiency and profits while driving decentralization of biomass refining for economic benefits in rural and marginal areas.

Bio-LUSH

Contribution to EU policy

The objective of the project is to make a significant contribution to various EU initiatives and strategies, including the **European Green Deal**, the **EU Bioeconomy Strategy**, the **Circular Economy Action Plan**, the **Sustainable Textiles Strategy**, the **Zero Pollution Action Plan**, the **New European Bauhaus Initiative**, the **EU Industrial Strategy**, and the forthcoming **Sustainable Product Initiative**.

Additionally, the growth of the European fibrous bio-economy can serve as a potent means of rejuvenating marginalized regions afflicted by desertification or socio-economic challenges.



Ecotex Insights:
“Glaukos’ project achievements on biobased coatings”

Koen Van Goethem

I-Coats

Date: 09/02/2024

Partners

Horizon 2020 European Union Funding for Research & Innovation

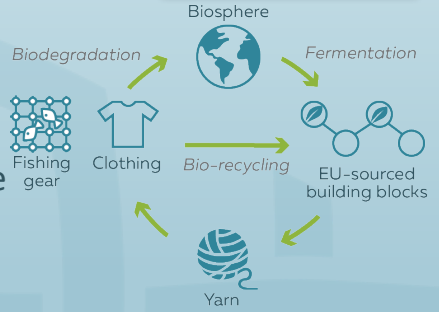
BBI JU

Bio-based Industries Consortium

Glaukos: Intro - Objectives

- Glaukos is the Greek god of fishermen.
  - He was commonly believed to protect the oceans, as is the ambition of this project by developing innovative alternatives for textiles that are currently pollution our oceans.
- Glaukos: aims to develop eco-friendly textiles for the **clothing** and **fishing** industry. (European Project)

  Sustainability of these textiles will be enhanced significantly, while technical performance will be matched to end-user requirements.



Objectives:

- Increase bio-based content of polyester and polyamide textiles to at least 50%
- Mitigate microplastic pollution by increasing biodegradation
- Reconcile sustainability characteristics with performance and durability
- Boost bio-recycling potential for textiles by developing recycling biocatalyst.
- Develop eco-friendly coatings with increased bio-based content (>30%)
- Engage stakeholders across the industry.

Project start: **June 1st 2020**
Duration: **4 years**

Glaukos

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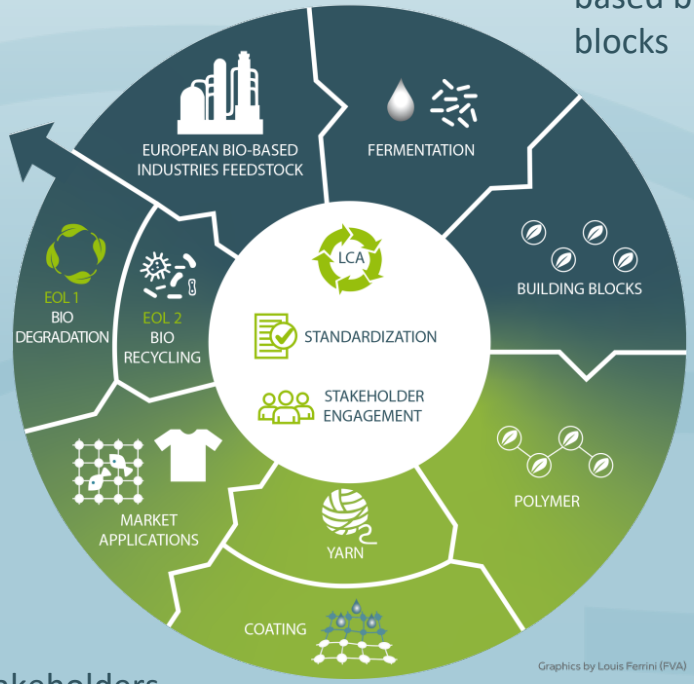
Horizon 2020 European Union Funding for Research & Innovation
BBI JU
Bio-based Industries Consortium

Glaukos approach

Develop new methodology for LCA, circularity and plastic leakage

Scale up production process of bio-based building blocks

Boost bio-recycling by developing compatible biocatalysts



Develop novel eco-design polymers with increased bio-based content

Increase the bio-degradation rate of bio-based polymers

Engage stakeholders across the clothing and fishing gear industry

Reconcile biodegradation characteristics with technical performance and durability of the overlay finishes and coatings

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I-Coats Activities/Achievements in Glaukos

- Development and testing of bio-based overlay finishes and coatings
- Mitigate microplastic pollution by increasing the biodegradation of the coatings
- Support other WP's
- Engage stakeholders across our industry

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I-Coats results

- Biobased overlay finishes and coatings have been developed for use in fishing and aquaculture:
  - biobased content 30%
  - Higer bio-based content is possible (60%), however there are strong indications that bio-degradation in the sea is also higher and consequently performance also decreases quicker.

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I-Coats results

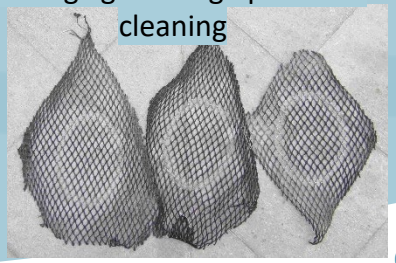
- The bio-based overlay finishes and coatings tested, show a similar (or better) performance in abrasion and mesh strength of netting as traditional coatings.


Abrasion testing of ropes @I-Coats


Abrasion testing of yarns@I-Coats


Testing netting @ I-Coats


Abrasion resistance Testing of netting against high pressure cleaning



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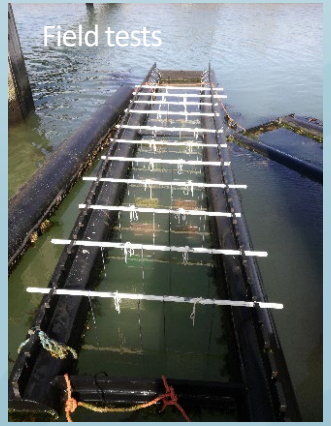
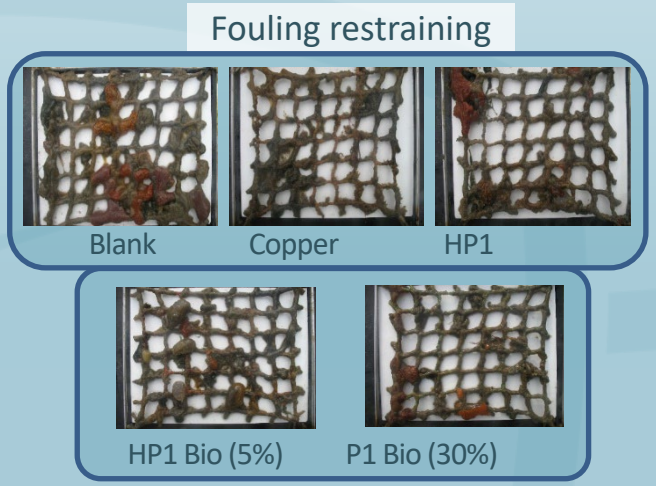
I-Coats results

- In aquaculture biodegradation should not have a negative effect on performance for at least one season



Evaluating fouling behavior in the field



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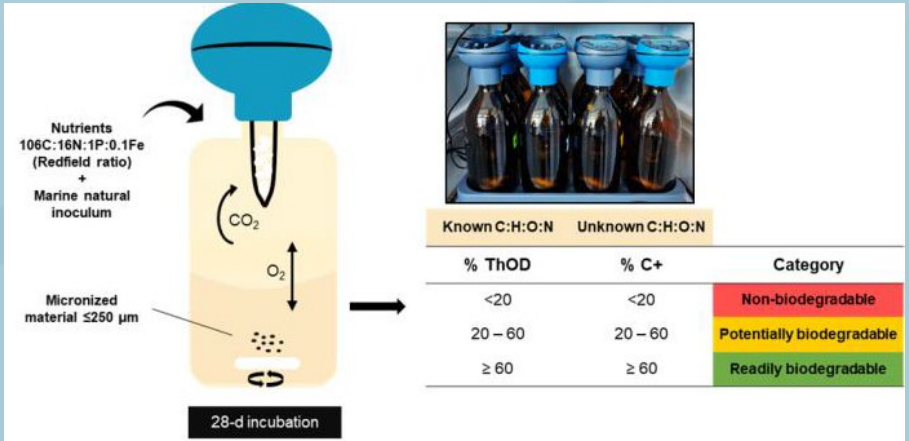
I-Coats results

- End Of Life (UVigo)
  - in WP6 a tool has been developed for assessing biodegradation of polymer degradation in sea water. (BOD or Biochemical Oxygen Demand)
    This has led to a publication.
  - Our coatings showed a higher biodegradation
    with a higher bio-based content.



Evaluating biodegradability in the field/lab (UVigo)

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@Follow Glaukos activities

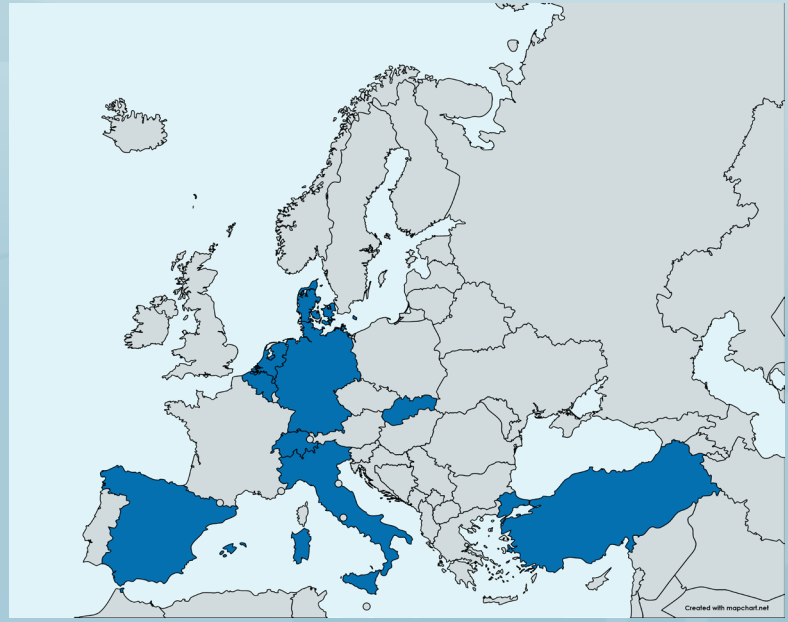
- Become a Stakeholder in Glaukos Lab
- Project website: www.glaukos-project.eu

- www.linkedin.com/company/glaukos-project
- twitter.com/Glaukos_project

To ensure that Glaukos will respond appropriately to the stakeholders needs and requirements, considering specific challenges, barriers and bottlenecks, the project is creating 2 stakeholder labs (fishing gear and clothing).

Horizon 2020 European Union Funding for Research & Innovation
BBI JU
Bio-based Industries Consortium

Thank you



This 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 887711

Glaukos

Horizon 2020 European Union Funding for Research & Innovation

BBI JU

Bio-based Industries Consortium

Upcoming Activities & Events

ECOSYSTEX
Insights Series #8

8 March 2024

ECOSYSTEX
Insights Series #9

31 May 2024

ECOSYSTEX
Insights Series #10

September 2024
tbc

Upcoming ECOSYSTEX Member Events

Bio-LUSH & CBE-JU

28-29 February 2024
Amsterdam, NL & online

2nd Annual World Biopolymers and Bioplastics Innovation Forum

Register here

CIRPASS

5 March 2024
Online

State of Play and Possible Future Developments of the DPP

Register here

New Cotton Project

21 March 2024
Espoo, Finland

Concluding seminar: Exploring the Future of Circular Textiles

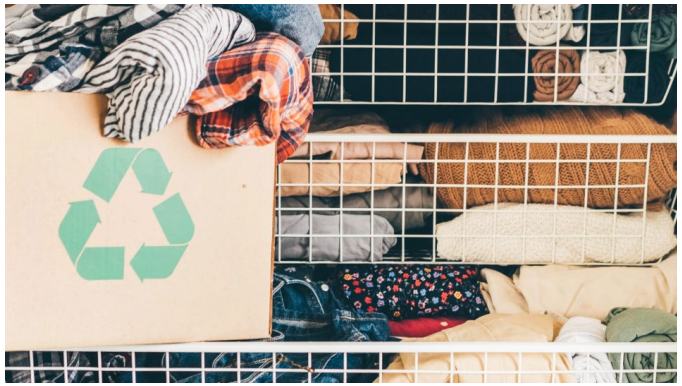
Register here

ECOSYSTEX Member News

SCIRT

Interactive tool to learn more about the way you shop

Try out here



tExtended

Community of Practitioners for knowledge sharing related to textile circularity

Read more here

IRISS

New publications on SSbD: takeaways from SbD and value chain analysis

Read more here

ETP Fibres Textiles Clothing
EUROPEAN TECHNOLOGY PLATFORM

CENTEXBEL

RI.SE Research Institutes of Sweden

sfi SÄCHSISCHES TEXTIL FORSCHUNGS INSTITUT e.V.

CENTROCOT Innovation experience

Ceti TRANSFORMATIVE TEXTILES

Circular & Biobased Textiles
Innovation Hub

The Circular & Biobased Textiles Innovation Hub **brings together European textile sustainability experts to learn, network and collaborate on the hot topics of circular and biobased textiles.**

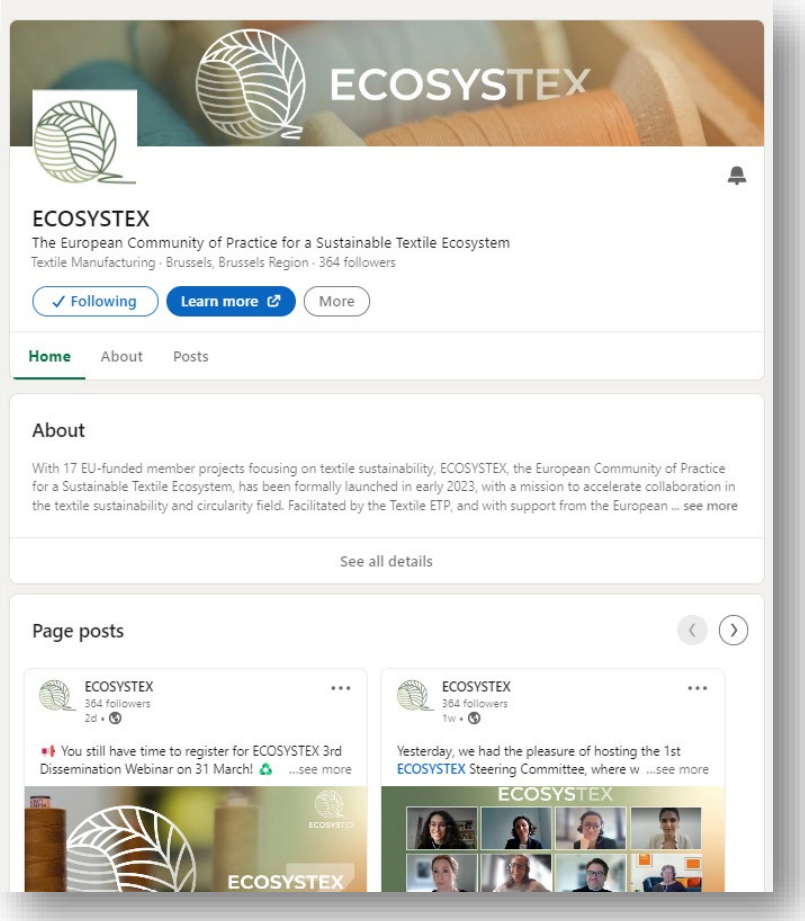
Find out more on our website:
www.textile-platform.eu/innovation-hub-circular-and-biobased-textiles

Programme kick-off:
mid-February 2024

Subscribe now!

Where European sustainable textile experts meet

How to stay in touch?



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- **Membership request for EU funded, textile sustainability and circularity-focused projects:** *info@textile-platform.eu*

ECOSYSTEX Facilitator:

Textile ETP
info@textile-platform.eu

More information on:

https://textile-platform.eu/ecosystex

ECOSYSTEX

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This project has received funding from the European Union's Horizon Europe Research and innovation program under grant agreement No 101060375.

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