EU GREEN WEEK PARTNER EVENT

Contributing to the circular economy by clean, competitive & industrial-scalable solutions coming from EU-funded projects

#EU GREEN WEEK

Online webinar

June 10th, 2025. 10:00 – 12:00 CEST time

Register here

Hosted by the projects LIFE POLITEX and LIFE ANHIDRA, in this webinar you'll learn about EU initiatives focused on recycling, waste recovering & resource reduction during manufacturing of goods. Some reliable examples from industries like textile, composites, food/packaging, metal and I-U symbiosis, about: closed-loop systems, technologies for recirculating water and extracting resources form wastewater, technologies for mechanical/chemical recycling of textiles and polymers, valorization of waste streams (liquid fractions) for re-using them or for producing energy (e.g., biogas), etc.

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01 Circular economy: recycle, reuse, reduce

10:10 – 10:20 **Fibre to fibre full circularity in the textile sector through novel polyester recycling technologies.**
LIFE POLITEX. Concha Silvestre (AITEX, ES)

10:20 – 10:30 **Viable, safe and sustainable PHBV value chain for food packaging applications**
VISS. Pablo López (AITEX, ES)

10:30 – 10:40 **New bio-based and sustainable Raw Materials enabling Circular Value Chains of High-Performance Lightweight Bio-Composites**
R-LIGHTBIOCOM. Ivan Domenech (AITEX, ES)

10:40 – 10:50 **Circular Systemic Solutions for Plastic, Packaging, Bio-Waste and Water**
CIRCSYST. Ángel Marcos Vicente (AIDIMME, ES)

02 Industrial-urban symbiosis

10:55 – 11:05 **Aragon's Regional Hub for circularity. Demonstration of local-industrial urban symbiosis initiatives**
REDOL. Jorge Arroyo (CIRCE, ES)

11:05 – 11:15 **Industrial-Urban Symbiosis: a journey towards a circular economy**
SYMSITES. Emma Pérez (AITEX, ES)

11:15 – 11:25 **Securing local supplY chains via the development of new Methods to assess the circularity and symbiosis of the Bio-bAsed industrial ecosystem enhancing the EU competitiveness and resource independence**
SYMBA. Marco de la Feld (Enco Consulting, IT)

03 Valorization of waste streams to obtain energy & new resources

11:30 – 11:40 **Brine metal waste valorization to produce coagulants for wastewater treatment**
LIFE WASTE2COAG. Laura Grima Carmena (AIDIMME, ES)

11:40 – 11:50 **Valorisation of cellulosic fibres collected from the ANHIDRA water treatment loop**
LIFE ANHIDRA. Víctor Herráez (AITEX, ES)

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LIFE POLITEX

Fibre to fibre full circularity in the textile sector through novel polyester recycling technologies

Coordinator

aitex research & innovation center · ANTEX · coleo · selenis

Co-funded by the European Union

101148221- LIFE23-ENV-ES-LIFE POLITEX

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CALL: LIFE 2023-SAP-ENV - Circular Economy and Quality - Circular Economy and Waste

PROJECT LOCATION: Spain, Portugal and Italy

BUDGET INFORMATION:

- **Total amount:** 5,030,070 €
- **% EC Co-funding:** 60%

DURATION: 42 months

BENEFICIARIES: 5 BENEFICIARIES + 2 AFFILIATED ENTITIES

- **COORDINATOR**: ASOCIACION DE INVESTIGACION DE LA INDUSTRIA TEXTIL Y COSMÉTICA (**AITEX**). Spain.
- **BENEFICIARY**: COLEO RECYCLING BCN SL (**COLEO**). Spain.
- **AFFILIATED**: WASTEX TECHNOLOGIES SL (**WASTEX**). Spain.
- **BENEFICIARY**: SELENIS PORTUGAL SA (**SELENIS PORT**). Portugal.
- **AFFILIATED**: SELPET POLIMEROS SL (**SELPET**). Spain.
- **BENEFICIARY**: SELENIS EUROPE SA (**SELENIS EU**). Portugal.
- **BENEFICIARY**: ANGLES TEXTIL SA (**ANTEX**). Spain.

PRESENTED BY: Concha Silvestre (csilvestre@aitex.es)

THE PROBLEM

Textile industry's linear model and fast fashion

93 billion m³ of water and 1.7 billion tonnes of CO_2 emissions in 2020

TEXTILE WASTE GENERATION

22% collected for **recycling**

78% incinerated or landfilled

Released around 1 million tonnes of microfibres into the oceans and responsible for 92 million tonnes of waste

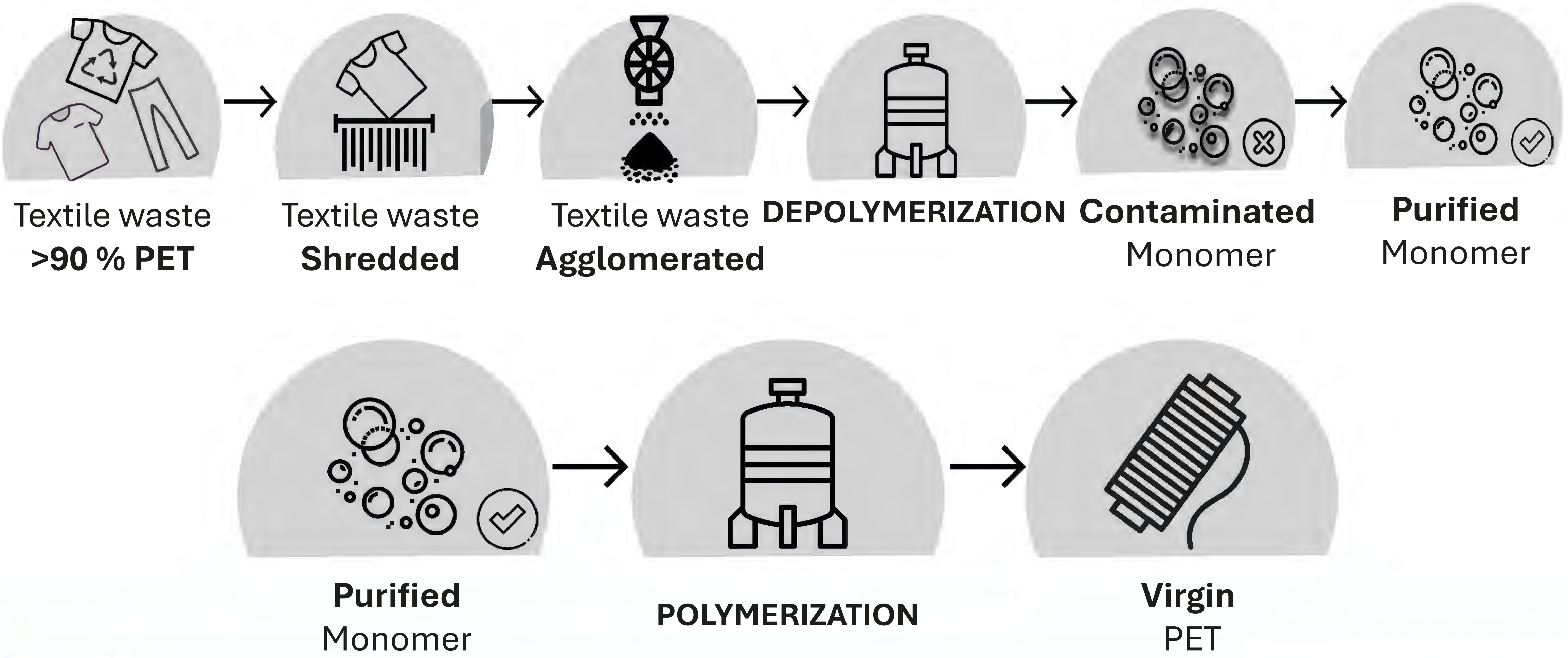
Environmental impact

There is a growing need for **fibre-to-fibre recycling** to create a circular economy in the textile sector.

OUR PROPOSAL TO TACKLE THE PROBLEM

LIFE POLITEX will be **the first close-to-market project** capable to demonstrate the high performance and cost effectiveness of polyester recycling to introduce fibre-to-fibre full circularity in the textile industry.

OUR PROPOSAL TO TACKLE THE PROBLEM



OUR PROPOSAL TO TACKLE THE PROBLEM

CHALLENGES

1. Complexity of the post-consumer textile fraction
2. Efficiency of the depolymerization process
3. Costs and energy consumption
4. Quality assureance of r-PET
5. Current scale limitations

LIFE POLITEX SOLUTIONS

1. Advanced separation technologies and validated prototypes
2. Optimized depolymerization processes for real textile waste
3. Collaboration between industrial players with expertise in recycling, polymers and textiles
4. An approach that prioritizes economic and environmental viability, not just technical feasibility

WHAT WE EXPECT TO ACHIEVE AT THE END OF THE PROJECT

Textile waste reduction → Recycling **4,500** tn/year

Polyester

GHG emission reduction → **9,015** tn CO_2/year

Circularity improvement → Reintroducing up to **550** tn/year of r-PET

Industrial Chemical Recycling → **Scaling up** chemical recycling processes to industrial levels.

High-Purity Recycled Polyester → Ensuring high purity in **recycled polyester fibers** (99%).

OUR LEGACY

REPLICATION

Internationalization expected by 2030 in northern Italy and a second European country by 2031

Emphasizes circularity, flexibility, and techno-economic **efficiency**

Decrease **CAPEX** by **20%**

Lower **environmental footprint**

Expand waste treatment and recycling capabilities

Transferability of LIFE POLITEX solution to other sectors (automotive, food packaging…)

MORE INFO

LIFE POLITEX - CIRCULARIDAD TOTAL FIBRA A FIBRA EN EL SECTOR TEXTIL A TRAVÉS DE NUEVAS TECNOLOGÍAS DE RECICLAJE DE POLIÉSTER - Aitex

LIFE 3.0 - LIFE23-ENV-ES-LIFE-POLITEX/101148221

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LIFE POLITEX

Thank you for your attention.

Coordinator

aitex research & innovation center ANTEX coleo selenis

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ViSS Consortium

- Project Name: ViSS. Viable, safe and sustainable PHBV value chain for food packaging applications
- Project start/end: September 2023/ August 2027
- Coordinator Name and Contact: CETEC (Carmen Fernandez) coordination@viss-project.org
- Project website: https://viss-project.eu/
- Project LinkedIn: https://www.linkedin.com/company/viss-project/

United Kingdom:

UNIVERSITY OF BIRMINGHAM

Belgium:

Beaulieu International Group

Spain:

cetec

cetec Biotechnology

Kveloce

aitex

idener.ai

IRIS

Universitat d'Alacant / Universidad de Alicante

zukán

Finland:

VTT

The Netherlands:

helianPolymers

Italy:

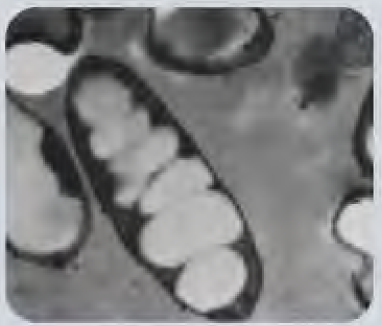
ICONS

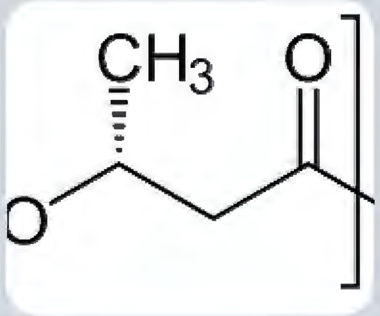
TECNOALIMENTI

propa group

ViSS purpose

End of Life → Residues





Biopolymers as an alternative to fossil based materials

PHAs 100% biodegradable and synthesized by microorganisms from renewable carbon sources

PHBV copolymer suitable properties for food packaging applications

Pros

Cons

Biodegradability

Decent mechanical properties

High cost feedstock

Poor processability (nucleation rate)

Lack of flexibility, poor reciclability

VISS Solutions

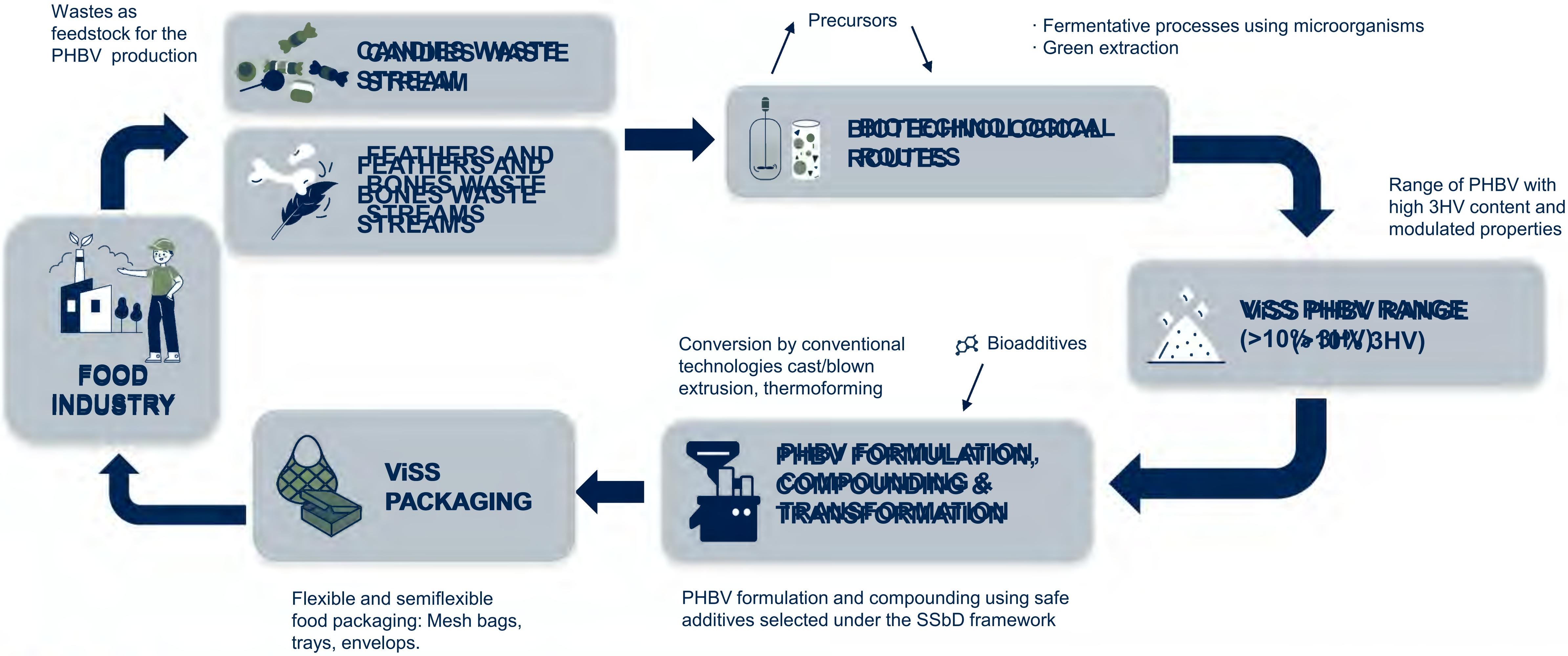
Use agrofood industry wastestreams as feedstock as C, N, P source

Non hazardous, EFSA/GRAS certified additives

Design of PHBV blends to reach optimal mechanical properties

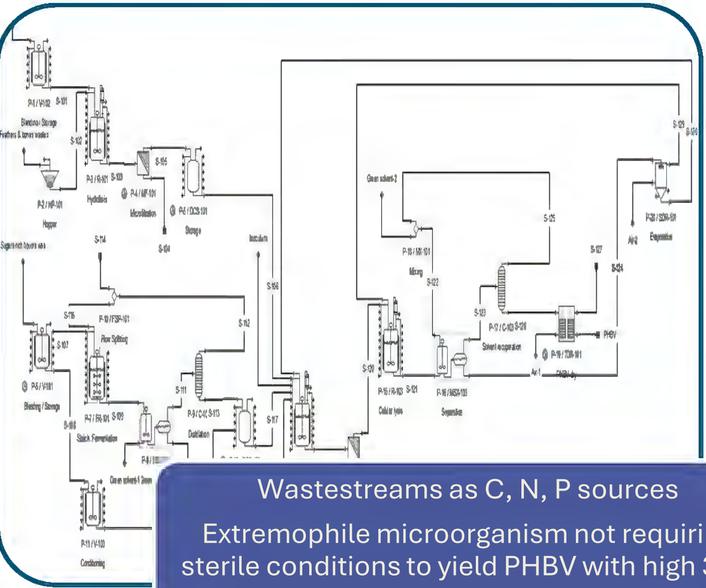
SSbD framework

ViSS: From food industrial residues to high performance food packaging



Project Roadmap

Process optimization and demo pilot plant setup



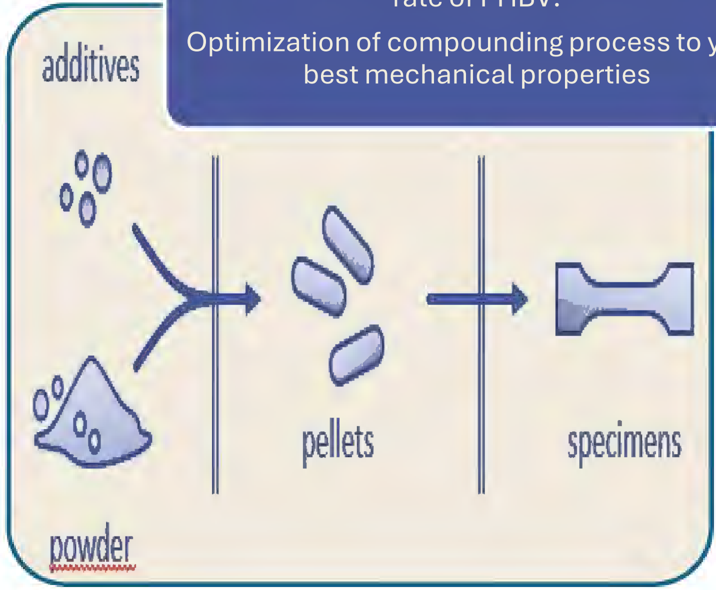
Wastestreams as C, N, P sources

Extremophile microorganism not requiring sterile conditions to yield PHBV with high 3HV content and non-costly VFAs precursors.

Innovative green downstream processes to extract the PHBV

Study and characterization of different components intended to modify nucleation rate of PHBV.

Optimization of compounding process to yield best mechanical properties

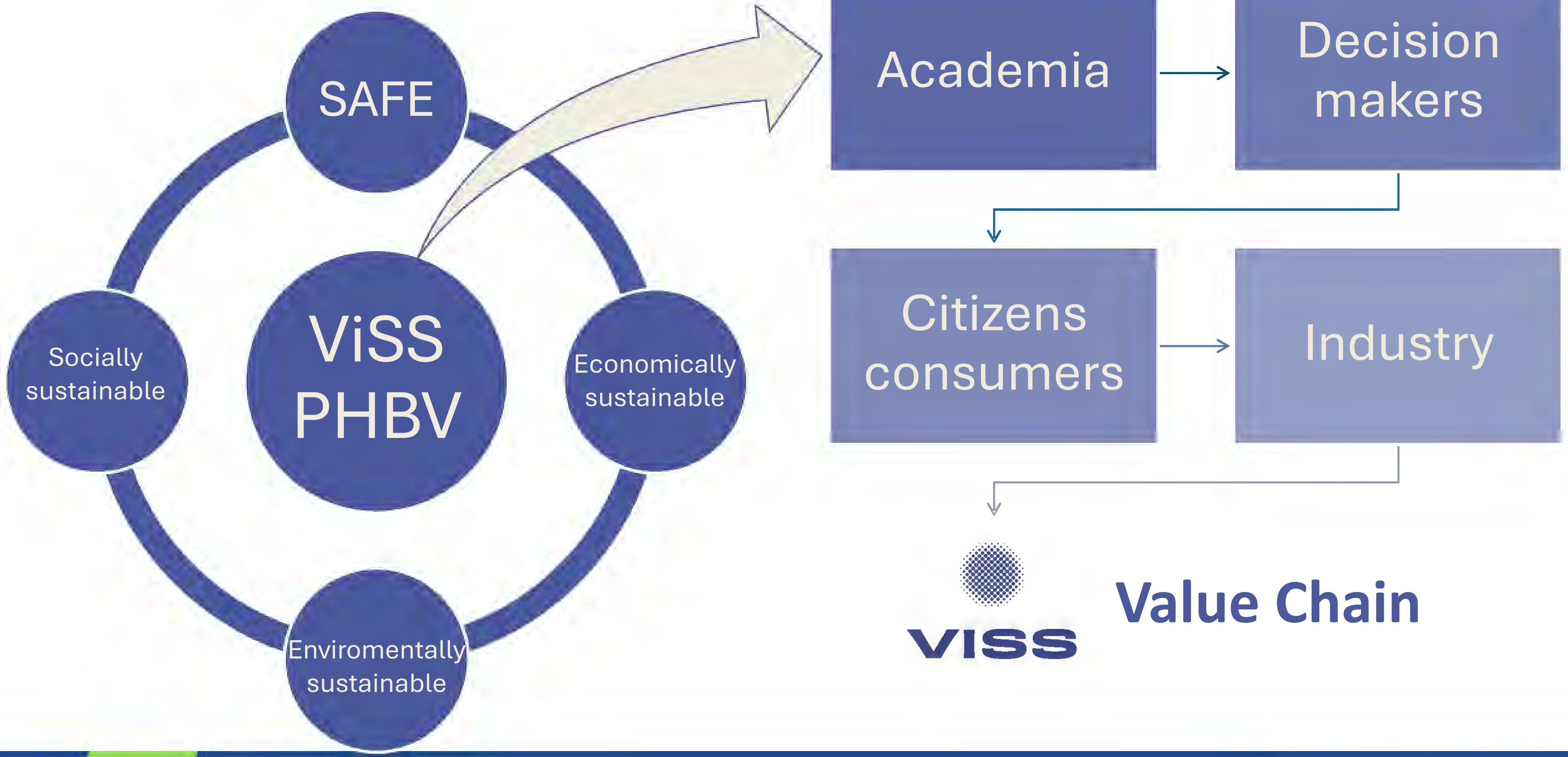


Additives and compound optimization

Validation and transformation of ViSS PHBV

Obtention of thermoformed trays, films and knitted bags for food packaging from ViSS PHBV, pilot and industrial scale.

Analysis of End of Life scenarios. Assesment on reciclability


SAFE
ViSS PHBV
Socially sustainable
Economically sustainable
Enviromentally sustainable
Academia
Decision makers
Citizens consumers
Industry
VISS
Value Chain

Expected Project results

- Sustainable production of a PHBV range with high 3HV content (>10% 3HV) using residues as feedstocks.
- PHBV safe and sustainable formulation for flexible and semiflexible food packaging applications (mesh bags, bags, envelops, trays).
- Biodegradability and mechanical recyclability of PHBV products demonstrated.
- Adoption of the ViSS value chain under a SSbD framework.

Expected Project outcomes

- Reduction of CO_2 emissions: ↓57.3% the CO_2 emissions per kg of polymer in comparison with fossil based counterparts.
- Contribution to circularity, using residues as feedstocks and recirculating processes by-products: recirculating 288,95kt of biomass.
- Less toxicity materials: VISS plastic packaging manufactured upon non hazardous substances, avoiding the use of, at least 2,200 ton of hazardous substances.
- Enhance the consumers awareness about biobased plastics and the market acceptability.

VISS

Thanks for the attention

Contact us at:

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Find more on:

Viss-Project.eu

/company/viss-project

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UK Research and Innovation

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r-LightBioCom

New bio-based and sustainable Raw materials enabling Circular Value Chains of high performance Lightweight BioComposites

Presenter: Iván Doménech (idomenech@aitex.es)

Co-funded by the European Union

Consortium

Coordinated by AITEX, r-LightBioCom brings together a multidisciplinary consortium consisting of 15 project members from research and academia as well as from the automotive, aeronautics and construction industry from 4 European countries (Spain, Italy, Netherlands and Germany) and one associated EU country (UK).

42 months duration

15 partners

4.2 million funding

4 research institutions

3 universities

8 industrial partners

r-LightBioCom is an EU-funded project that applies a multidisciplinary approach to develop new sustainable, cost-effective and energy-efficient lightweight high-performance composites with inherent recycling properties in combination with novel efficient processing and recycling techniques.

Development Areas

MATERIALS

New advanced bio-based and recycled high-performance materials with inherent recyclability properties

PRODUCTION TECHNOLOGIES

Efficient processing techniques combined with recycling technologies

METHODS & TOOLS

for a standardised, holistic sustainable high-performance composite design, modelling and systematic optimisation

Expected outcomes

Material and processing results

- 3 types of advanced bio-based resin compounds
- 4 new additives based on functionalized and reactive biomass-derived nanofillers
- 4-5 new formulations for bio-resins including the bio-additives
- 3 families of sustainable textiles products for HPC components and structures
- 3 sustainable and bio-based types of components for lightweight HPC
- 2 new fast curing technologies

Sustainability results

- New recycling technologies
- Holistic optimisation tools for sustainable composite structures
- Tools for composite material modelling and validation

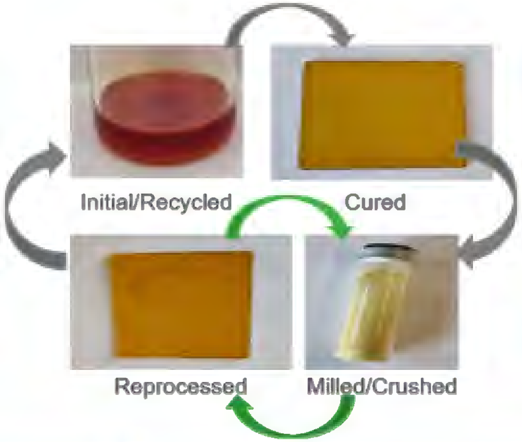
r-LightBioCom

Co-funded by the European Union

MATERIALS

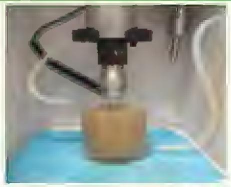
The basis of all r-LightBioCom results is the development of new raw materials that reduce weight and cost while introducing recyclability and sustainability into the resulting high-performance composites (HPC).

In this regard, new composite materials will be developed and studied comprising
i) bio-resins with covalent adaptable networks,
ii) bio-based additives
iii) recycled and/or sustainable fibres.



Enzymatic pre-activation of biomass

Functionalisation and nano-transformation



Yarns: rCF + PA6

Non-woven rCF non-consolidated (left), consolidated (right)

Rovings: r-Aramid + PA6 (left); r-Aramid + PA6 + Basalt (middle); rCF + PA6 (right)

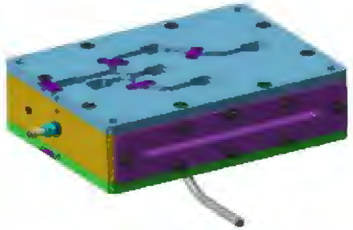
PRODUCTION TECHNOLOGIES

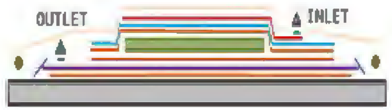
MATERIALS PROCESSING INTO INTERMEDIATES, COMPONENTS AND STRUCTURES

1. **Intermediates – Prepregs:** New formulations suitable for producing sustainable prepregs (bio-based, recovered and natural fibres)
2. **Components – Honeycombs:** technology to enable the transformation of non-woven textiles into honeycomb material, resulting in a more sustainable HPC component. Novel manufacturing technology.
3. **Structures – Textile Reinforced Composites:** Replacing conventional materials such as steel, aluminium and concrete

INNOVATIONS IN PRODUCTION PROCESS: NEW FAST CURING TECHNIQUES

1. **Resin transfer moulding (RTM) + Frontal Photopolymerisation**
2. **Microwave-assisted vacuum infusion.**



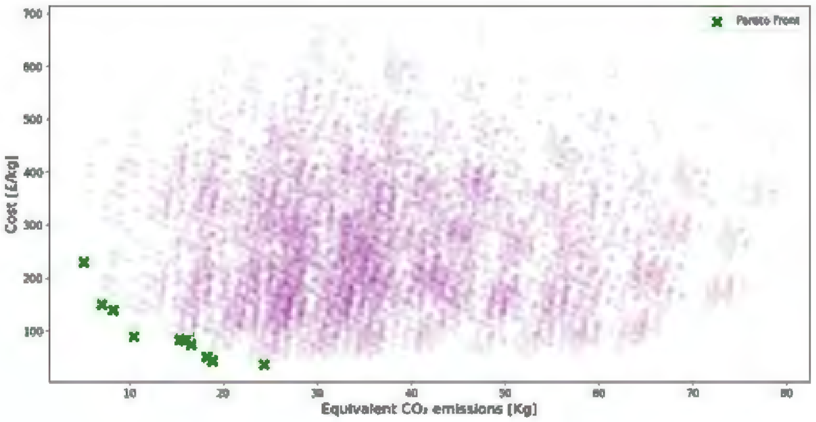


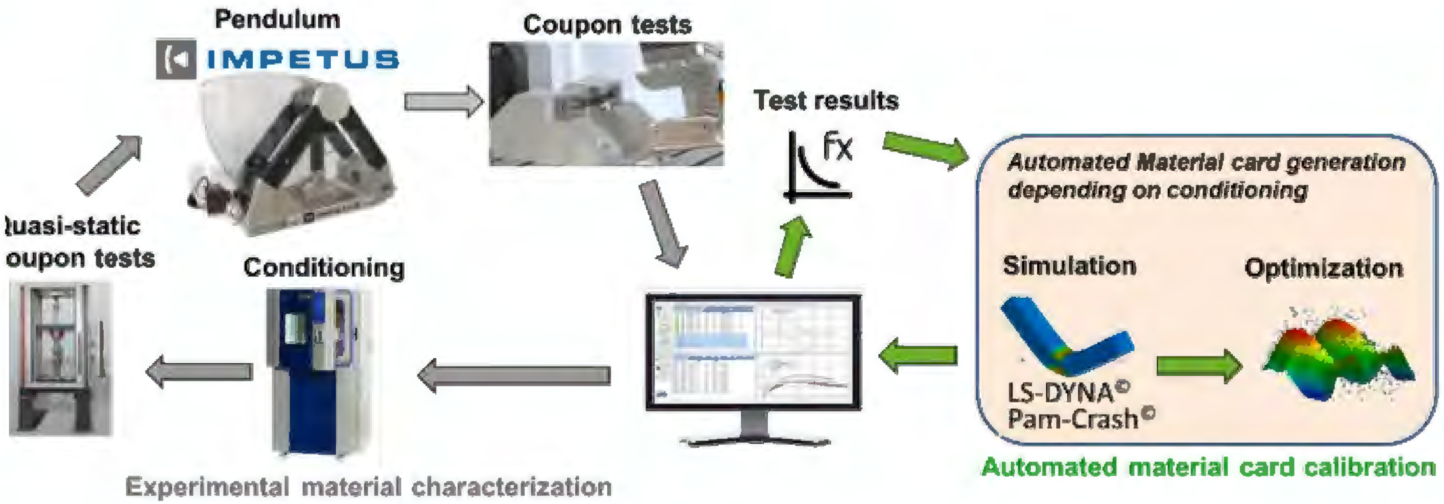
HOLISTIC OPTIMISATION FRAMEWORK FOR SUSTAINABLE DESIGN OF COMPOSITE STRUCTURES

METHODS & TOOLS

Coupled Ecological Optimisation (CEO) framework

Development of an innovative material card process for the development and validation of numerical simulations through the intensive use of optimisation algorithms.





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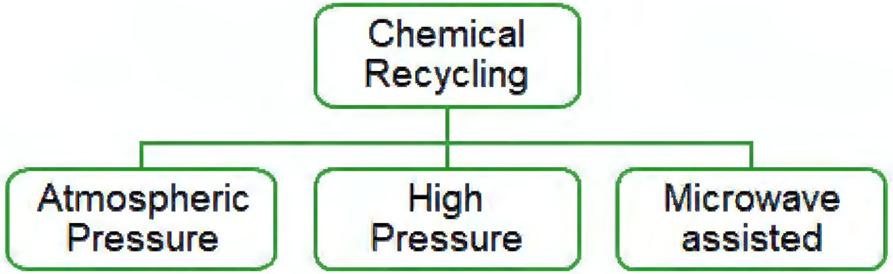
METHODS & TOOLS

RECYCLING METHODOLOGIES

Combining different chemical recycling processes (such as epoxidolysis and solvolysis using appropriate biological solvents and supercritical fluids) could provide better separation performances, enabling recycling of composites in a multi-step process to obtain a recycled liquid/soluble matrix and fibres suitable for subsequent reuse.



r-LightBioCom

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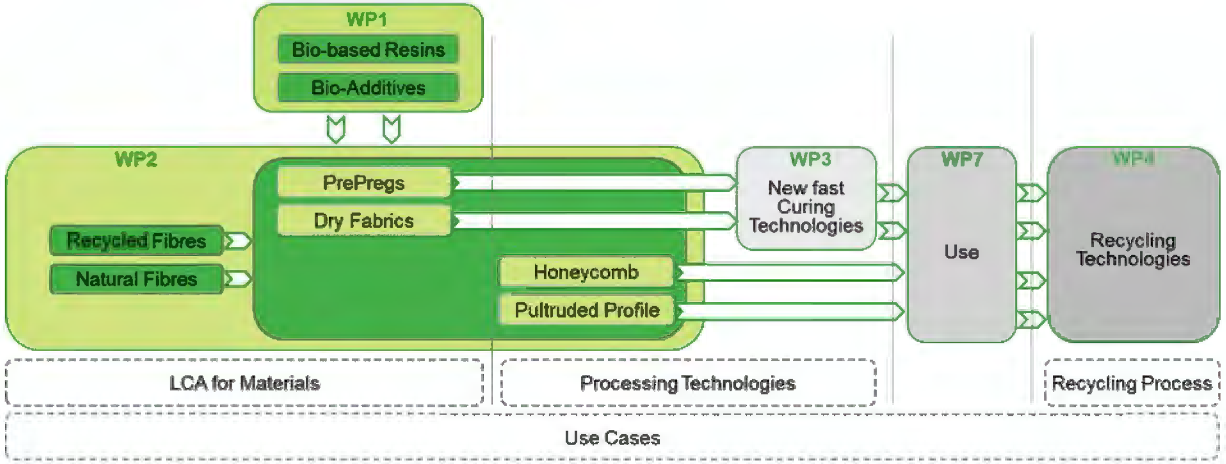
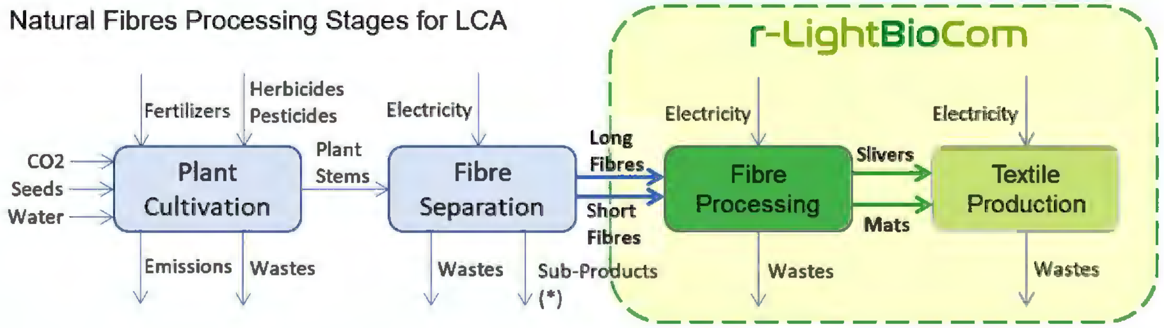
METHODS & TOOLS

LIFE CYCLE ASSESSMENT (LCA)

Verifying from an environmental point of view that the composites developed within the r-LightBioCom project give an advantage against the current state-of-art considering the different raw materials (resins, fibres and intermediate products) as well as curing technologies and recycling processes.





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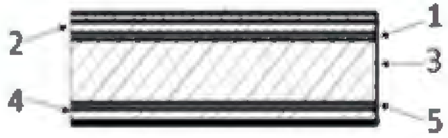
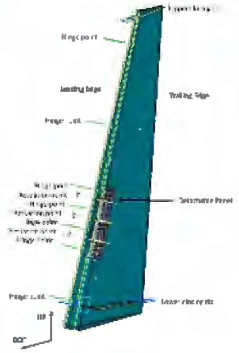
USE CASES

AUTOMOTIVE
Spoiler and trunk floor



INFRASTRUCTURE
Tunnel linning

AERONAUTIC
Leading edge



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Thanks for your attention!

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CIRCSYST Circular Systemic Solutions
PLASTIC • PACKAGING • BIO-WASTE • WATER

Title: Circular Systemic Solutions for Plastic, Packaging, Bio-Waste, and Water
Project number: 101135505

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AIDIMME Technology Institute

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Circular Cities & Regions Initiative

CircSyst key numbers

Partnership
32 partners
9 countries

3 Research areas
- Water
- Bio-Waste
- Packaging waste

Start date
June
2024.

Budget
11.44€ million.

EU Contribution
10.24€ million

Duration Approx.
36 months.

CIRCSYST Circular Systemic Solutions
PLASTIC • PACKAGING • BIO-WASTE • WATER

www.circsyst.eu

Partnership

CIRCSYST
Circular Systemic Solutions

CIRCSYST

Circular Cities & Regions Initiative

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CCRI Map

Comunidad Valenciana, Spain	CCRI Fellow
Flandes, Belgium	CCRI Pilot
Paijat-Hame-Lathi, Finland	CCRI Fellow
Thesaloniki, Greece	Potential new CCRI Members
Vimmerby, Sweden *	
Podravje (Maribor), Slovenia	
Central and East Hungary	

* And observing Gotemburg Pilot

Funded by the European Union

Objectives

Main objective: To contribute to catalyzing the transition towards a sustainable, circular economy through circular systemic solutions (CSS).

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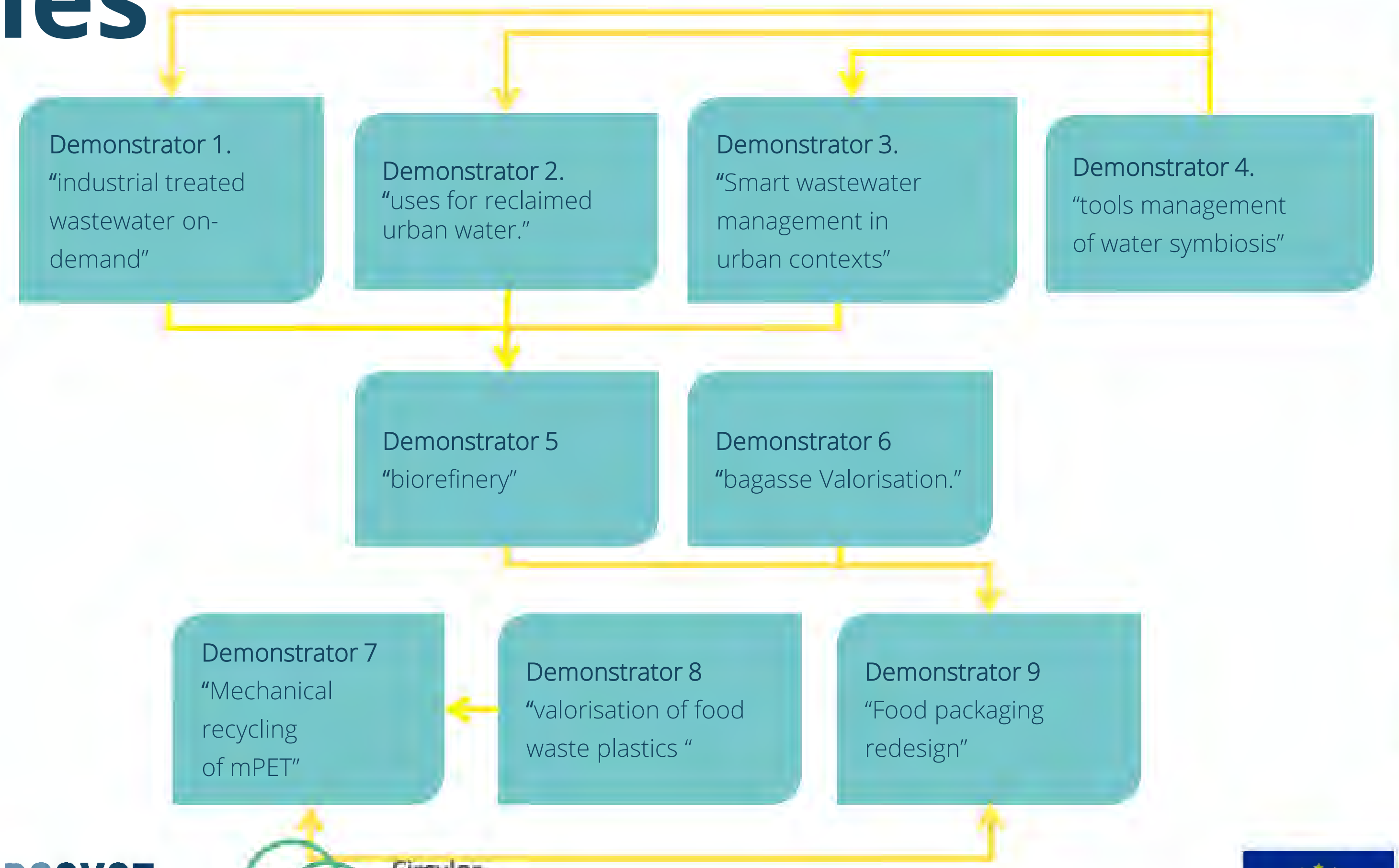
Main objective: To contribute to catalyzing the transition towards a sustainable, circular economy through circular systemic solutions (CSS).

CircSyst presents a series of **shared Demonstration Experiences** of new technological and societal adaptations to a Circular Economy involving 8 European regions.

The project focuses on **three of the priority value chains of the Circular Economy Plan:** Water Management, Biowaste, and Plastics and Packaging, as well as in the potential synergies among them.

Synergies



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DEMO 1

Reuse of industrial treated wastewater through on-demand treatment and management.

Objectives

The **main objective** is **to develop a symbiosis model by using reclaimed water to meet industrial and urban water demands** (i.e. street cleaning, park irrigation, fire fighting, etc.).

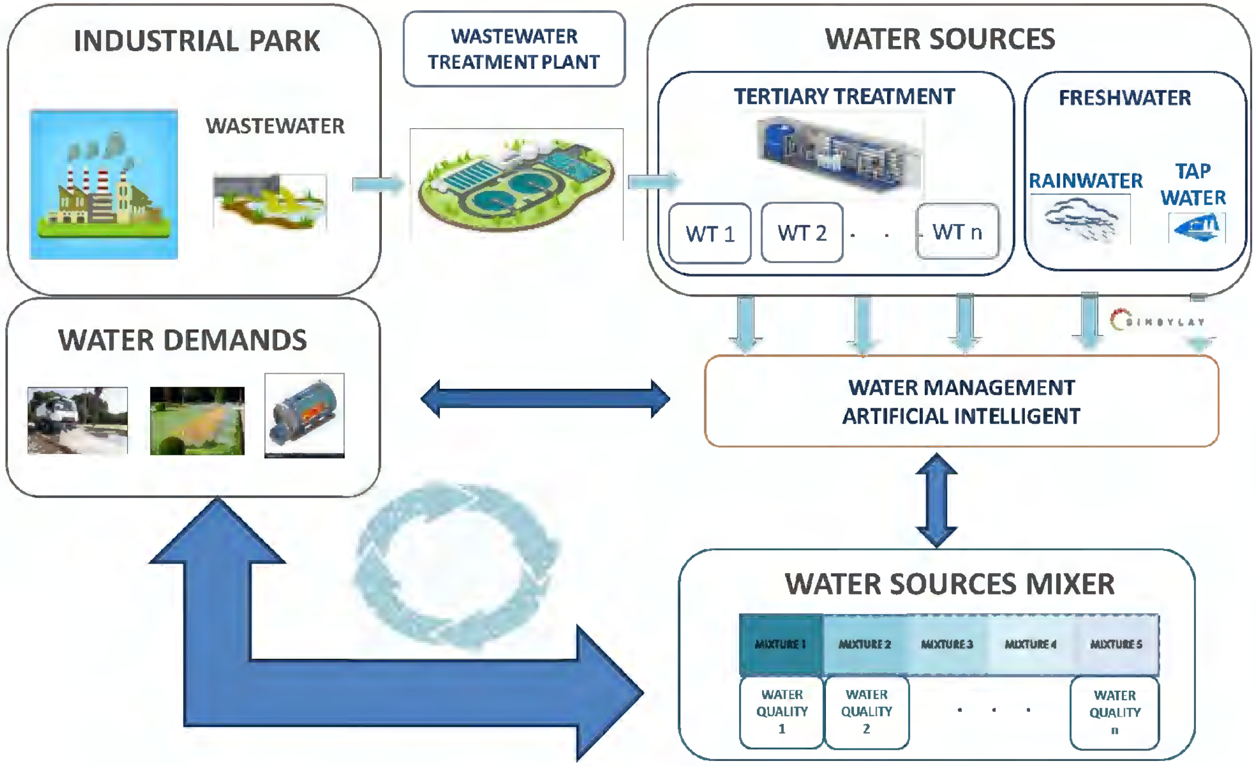
Specific objectives:

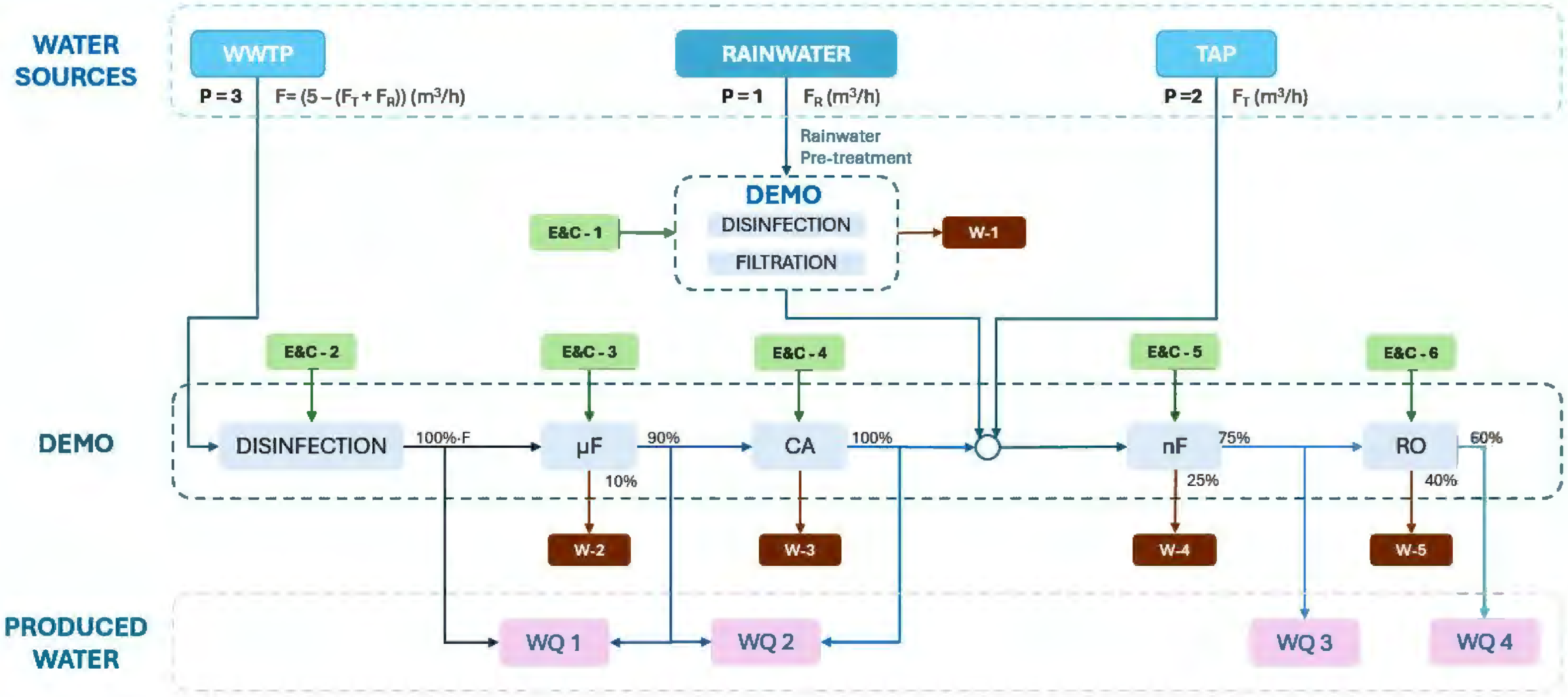
- To apply low-cost **tertiary treatment**, including rainwater, to obtain **different sources of reclaimed water**.
- To develop an **AI-supported water mixer**, where water sources can be adequately mixed to meet water demands in terms of quality.
- Develop an **intelligent water management system** to supply reclaimed water according to demand.

Overview

Demo 1 is designed to demonstrate **circularity and symbiosis** in water in a complex scenario.

It will be carried out in an **industrial park** where a wide range of water demands, both industrial and urban, will be covered by **reclaimed water, being managed by AI**.





WQ: Water Qualities
WQ1: Quality C
WQ2: Quality A+
WQ3: Low hardness
WQ4: Low mineralization

CA: Activated Carbon
F: Flow (m^3/h)
W: Waste (Cleaning or concentrate)
E&C: Energy + Chemicals
P: Priority of inlet (1= highest, 3= lowest)

Location and geographic scope

Located in the Casanova industrial area, near the town of Riba-roja, 18 km from Valencia. The current WWTP collects wastewater from sectors 12 and 13 of the industrial area.

The WWTP serves 2804 EI.

Location and geographic scope

Partners and roles

- **AIDIMME:** Basic design, commissioning, assembly, management and monitoring of the demonstration plant. Sensorisation of demands.
- **AQUATEC:** Sensorisation of the WWTP.
- **HIDRAQUA:** Management and monitoring of the WWTP.
- **Ribarroja City Council:** Management of reclaimed water for non-industrial applications (e.g. street cleaning, irrigation or fire extinguishing).

STAKEHOLDERS

- **Companies close to the WWTP in the industrial park:** 474 companies
- **EPSAR:** administrative procedures to obtain permits for the installation of the demonstrator.
- **Engineering companies:** detailed engineering, construction and installation of the demonstrator.

Thank you for your attention!

Ángel Marcos

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REDOL

Aragon's REgional hub for circularity: Demonstration Of Local industrial urban symbiosis initiatives

Jorge Arroyo – CIRCE Technology Centre

June 10th, 2025 - Online

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REDOL: Aragon's REgional hub for circularity: Demonstration Of Local industrial urban symbiosis initiatives

1 Topic

HORIZON-CL4-2022-TWIN-TRANSITION-01
(CLIMATE NEUTRAL, CIRCULAR AND DIGITISED PRODUCTION 2022)

2 IA action:

Demonstration or pilot + market replication

3 Project Cost: 17,012,301 €

4 EU Funding: 14,214,752 €

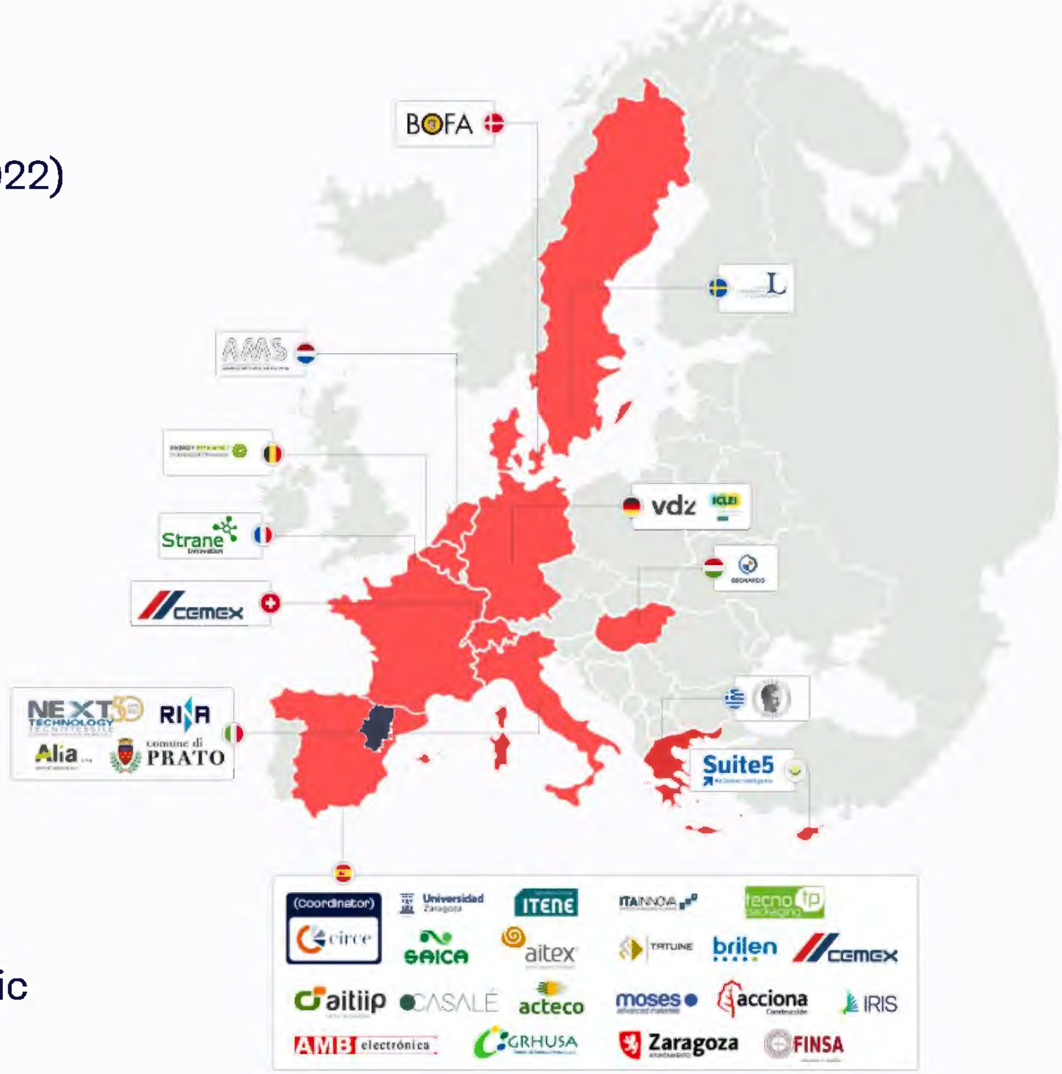
4 years

35 partners

12 countries

Starts: 12/2022
Ends: 11/2026

5 Large Companies – 12 SMEs – 11 RTOs– 5 Public Institutions – 2 Non-profit organizations

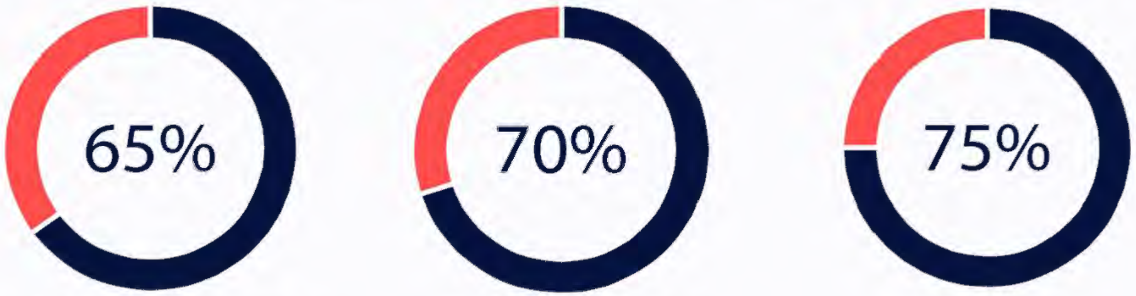


Problem and significance

500 kg per capita of SUW in the EU

45%

2030 targets for recycling

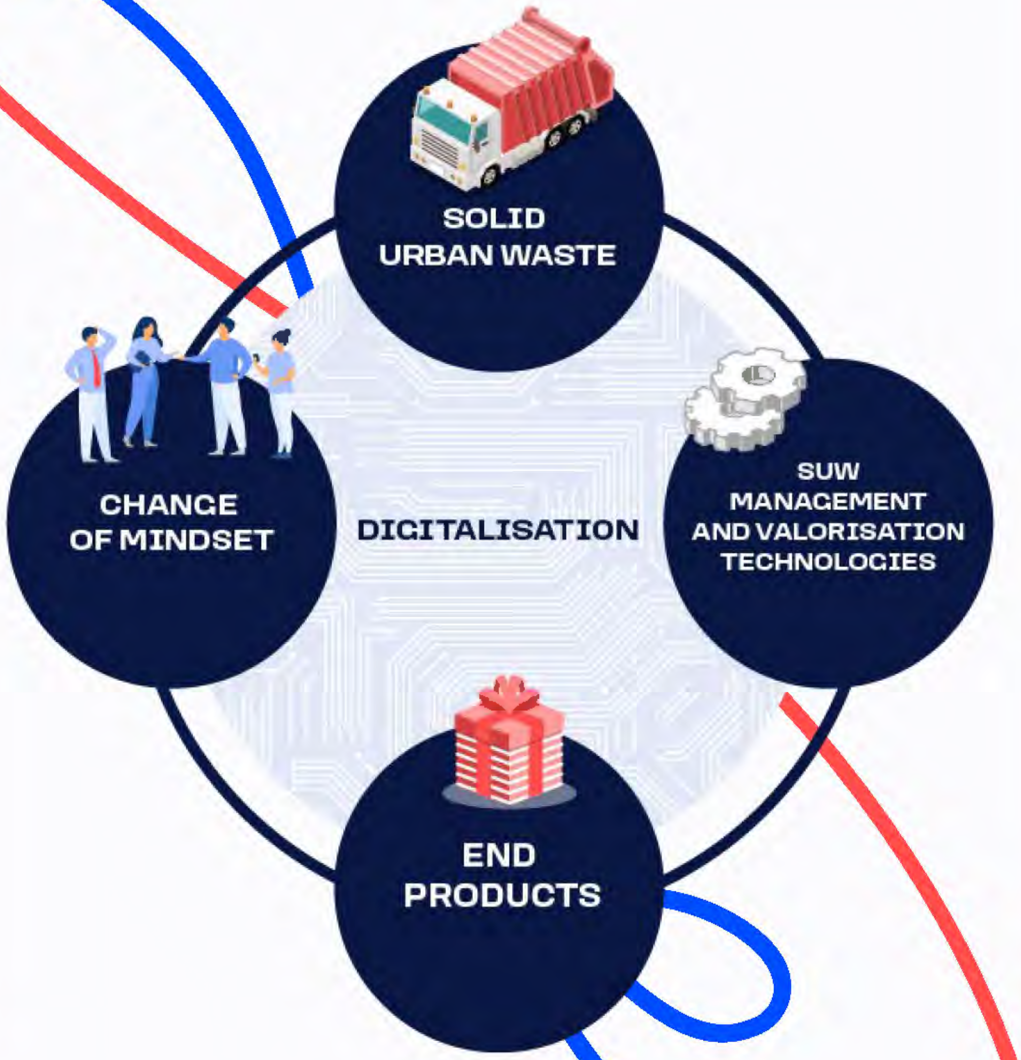


Solid urban waste (SUW)

Construction demolition waste (CDW)

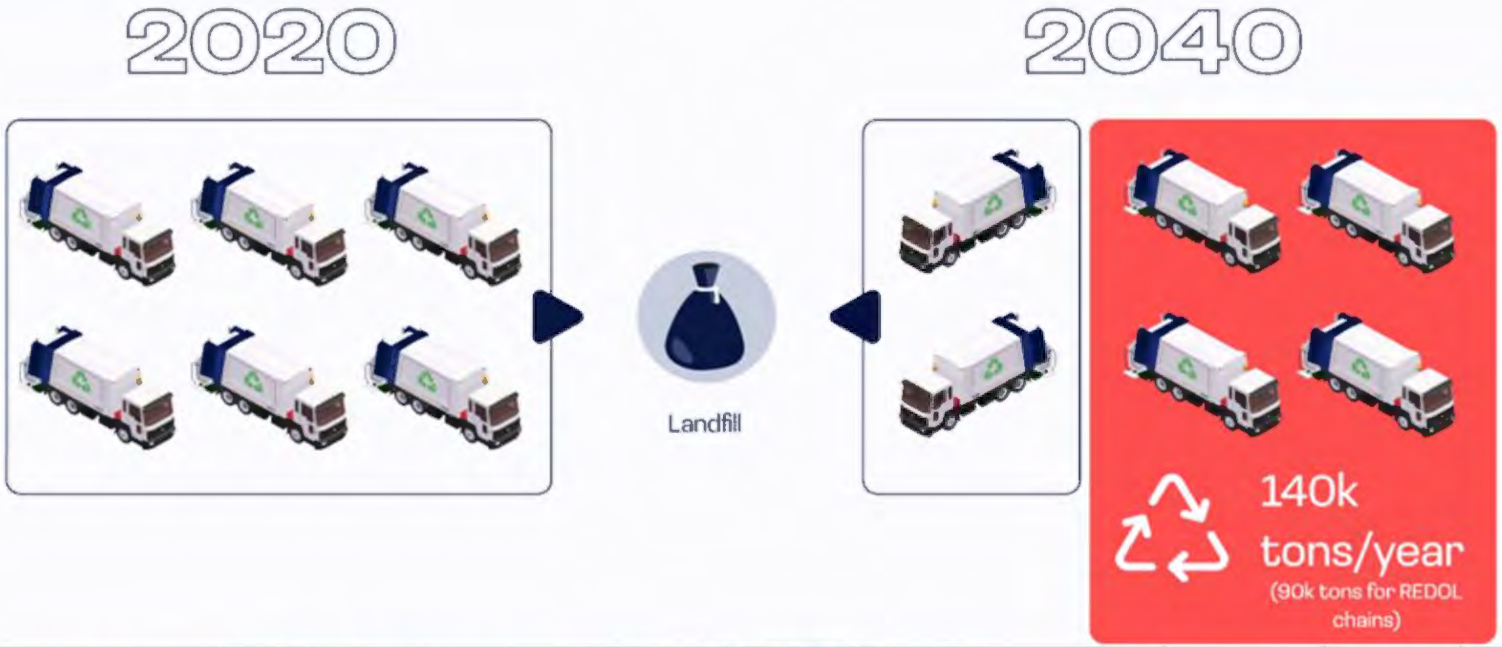
Packaging

SOLUTION: Redesign 5 value chains for SUW in Aragon



1. Data gathering, characterization and alignment between the value chain main actors
2. Upgrading technologies for the management and processing of SUW.
3. Development of digital tools for the monitorization, management and optimization of REDOL value chains and their linked I-US interactions among key players
4. Overall demonstration of REDOL technical, organisational and social innovations through the redesign of the addressed SUW streams into circular and symbiotic value chains.
5. Overall impact analysis, social actions and replication strategy.

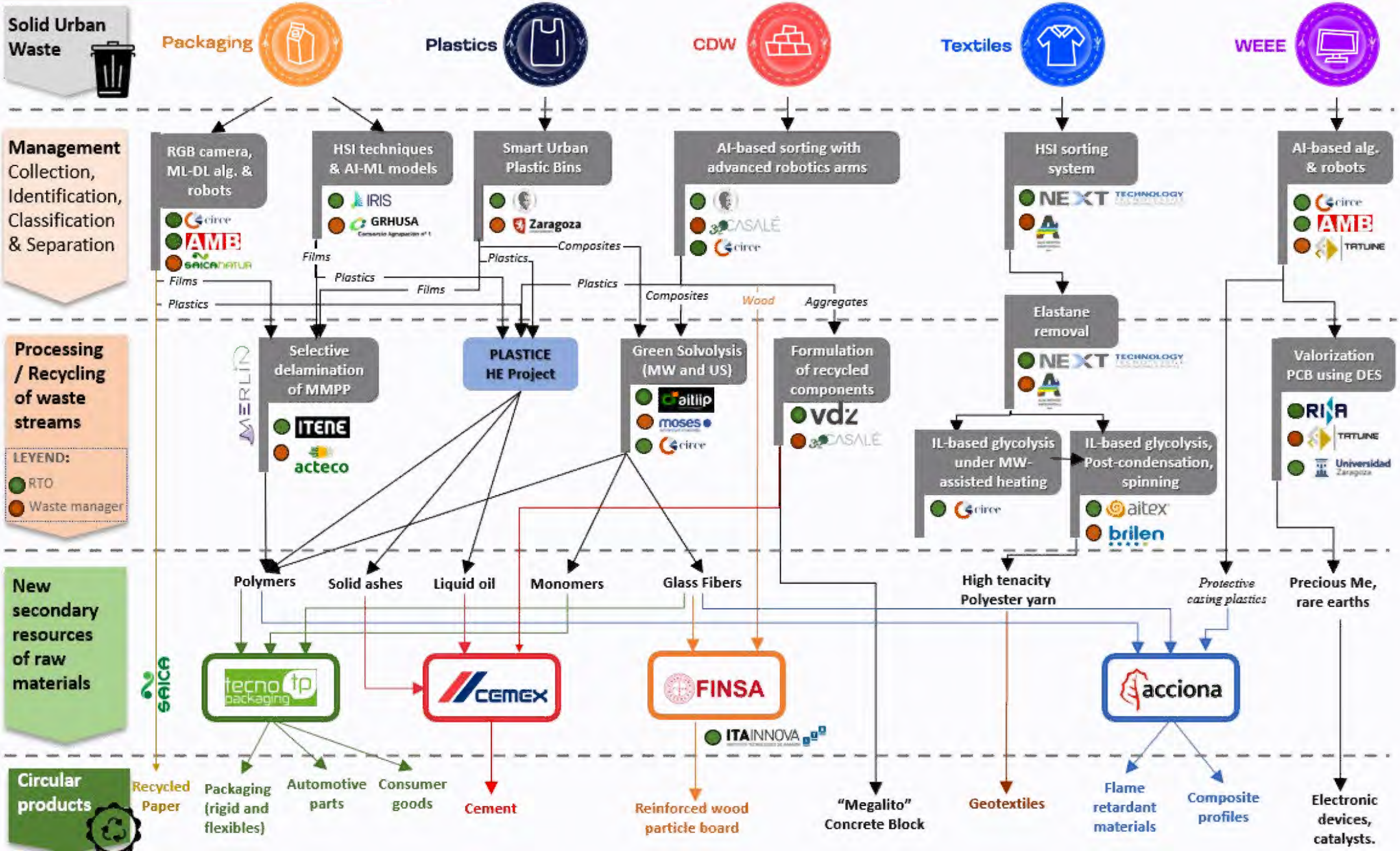
Impact



280 $ktCO_2$

14,000 M€

Methodology



Replication

PRATO

ENERGY EFFICIENCY in Industrial Processes

AMS

ICLEI Local Governments for Sustainability

BOFA

Amsterdam
(The Netherlands)

Support to increase the recycling of beverage (MMPP) materials

Bornholm
(Denmark)

Learn best-practices on the implementation of an urban bio-refinery and the establishment of approaches in CDW + digital tools

Prato
(Italy)

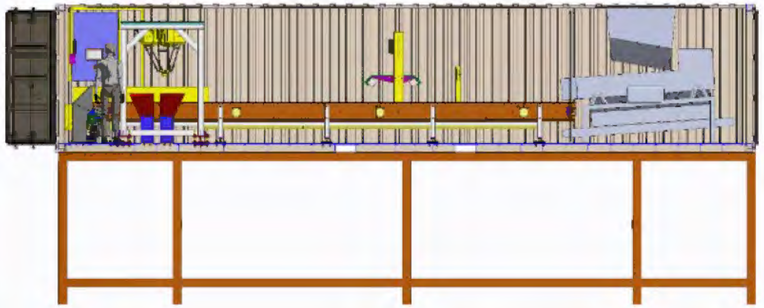
New SUW value chains, map all existing I-US potential activities in the city

RESULTS SORTING

PACKAGING

PLASTICS

CDW

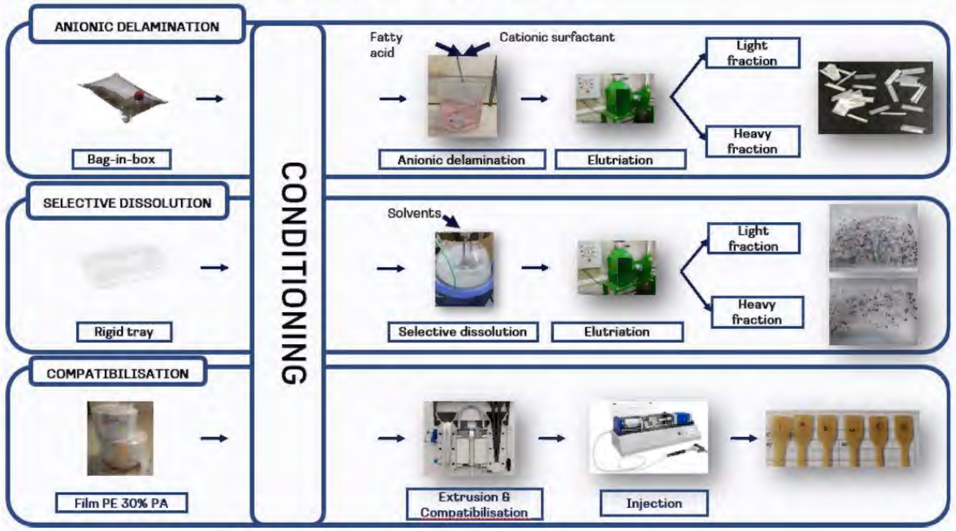


WEEE

TEXTILE

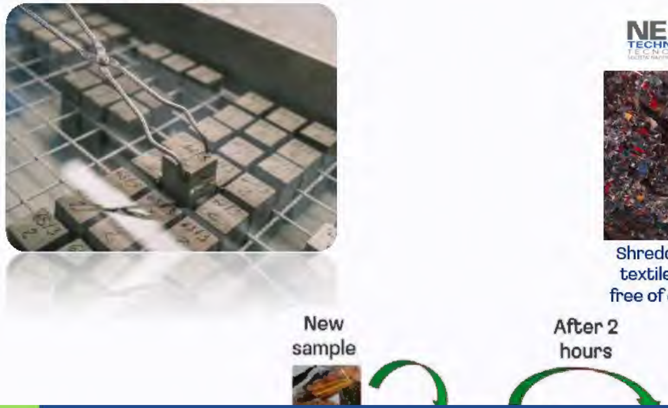
RESULTS RECYCLING

PACKAGING



PLASTICS

CDW



TEXTILE

June 10th, 2025 - Online
10:00am – 12:00pm CEST

#EU GREEN WEEK

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CIRCULAR PRODUCTS

PACKAGING

CDW

TEXTILE

PLASTICS

WEEE

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Main achievements

1. Characterization of value chains and main stakeholders
2. Identification of non-technical barriers for the valorisation of SUW
3. Development of Zaragoza waste resources mapping
4. Definition of the KPIs and impact evaluation methodology
5. Platform for data collection and sharing

Co-funded by the European Union

Thank you!

Jorge Arroyo– CIRCE

jarroyo@fcirce.es

www.redolproject.eu

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EU

Industrial-Urban Symbiosis:
a journey towards a circular economy

Emma Pérez Hernández
Project Manager, R&D Department, AITEX

This project has received funding from the European Union's Horizon Europe program under GA Project 101058426.

SYMSITES

INDUSTRIAL-URBAN SYMBIOSIS

THE PROBLEM

THE SOLUTION

THE OPORTUNITY

SYMSITES

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the European Union

SYMSITES

HORIZON-CL4-2021-TWIN-TRANSITION-01-14: Deploying I-U symbiosis solutions for the utilization of energy, water, industrial waste and by-products at regional scale (Processes4Planet Partnership) (RIA)

12.404.455 €

Industrial-Urban Symbiosis

New technologies

Stakeholders’ engagement methodologies

Four European regions

EcoSite concept

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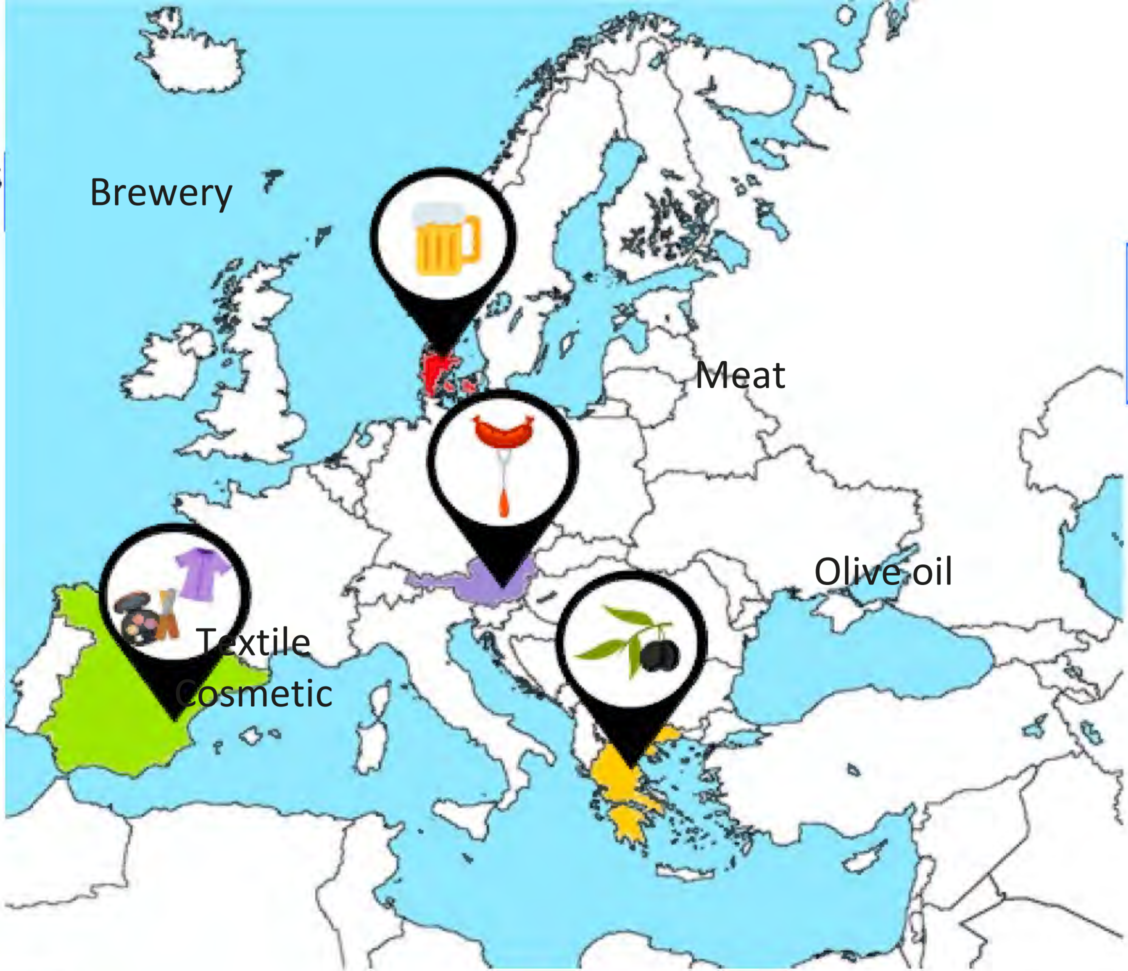
WHERE TO FIND THE ECOSITES?



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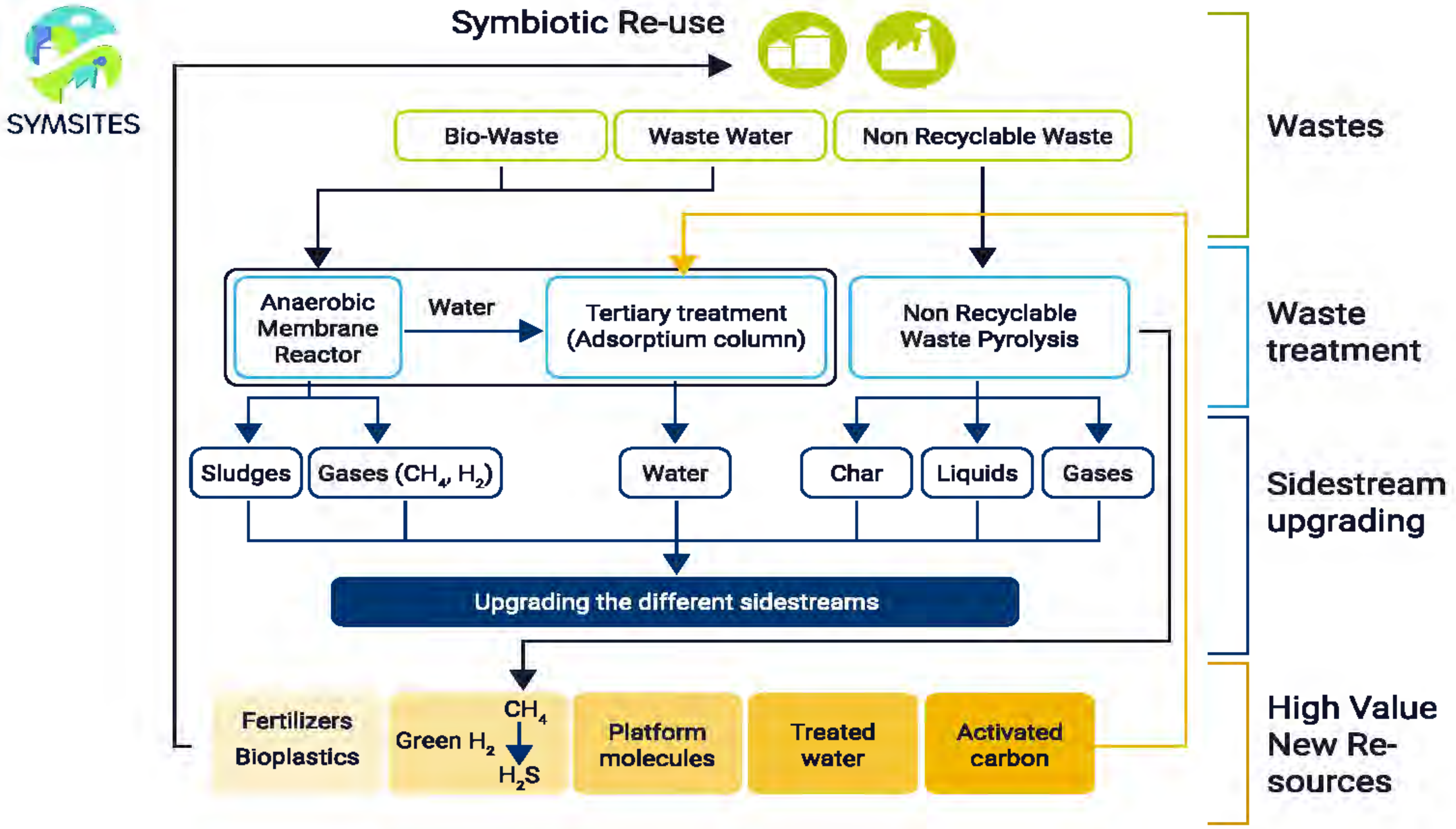
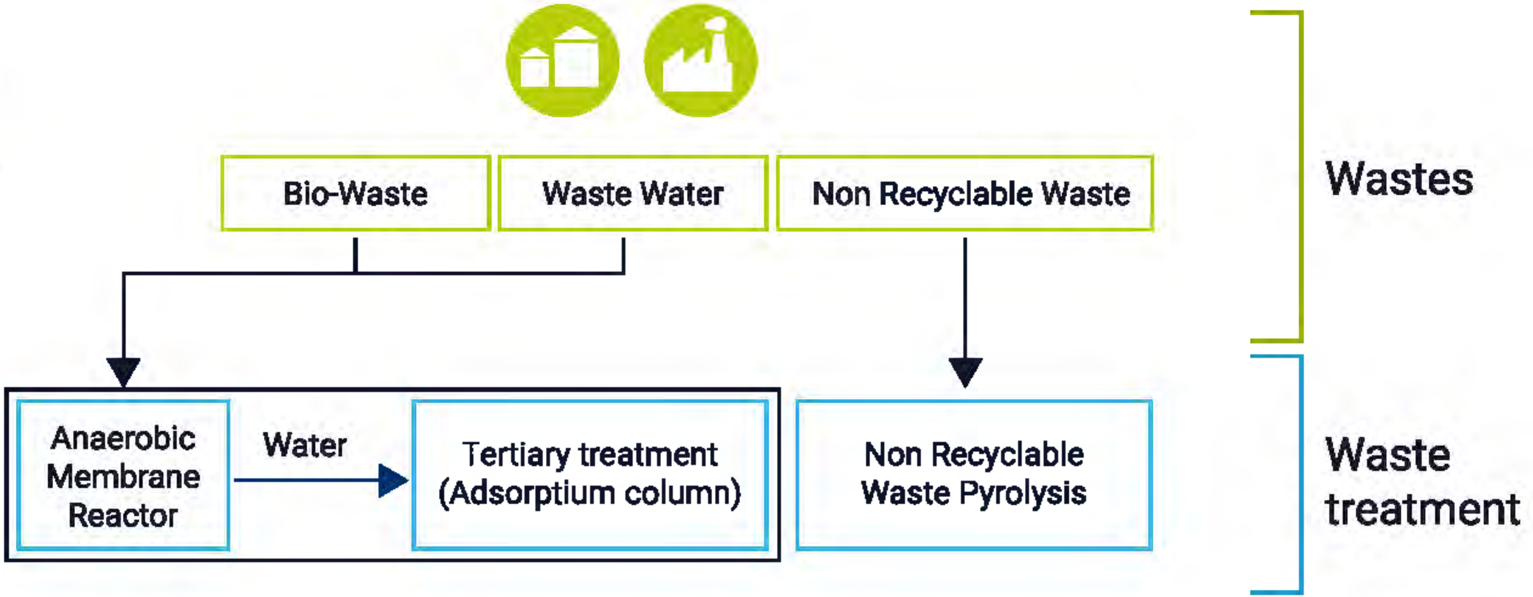

SYMSITES
Symbiotic Re-use
Bio-Waste
Waste Water
Non Recyclable Waste
Wastes
Anaerobic Membrane Reactor
Water
Tertiary treatment (Adsorptium column)
Non Recyclable Waste Pyrolysis
Waste treatment
Sludges
Gases (CH_4, H_2)
Water
Char
Liquids
Gases
Sidestream upgrading
Upgrading the different sidestreams
Fertilizers
Bioplastics
Green H_2
CH_4
H_2S
Platform molecules
Treated water
Activated carbon
High Value New Re-sources

SYMSITES



Energy from CH_4 and H_2 via metabolic route

Antifouling treatment

- Nano structured coatings
- Carbon dots coatings
- Magnetically induced membrane vibration

Pyrolysis optimization of NRW using CH_4 as an energy source.

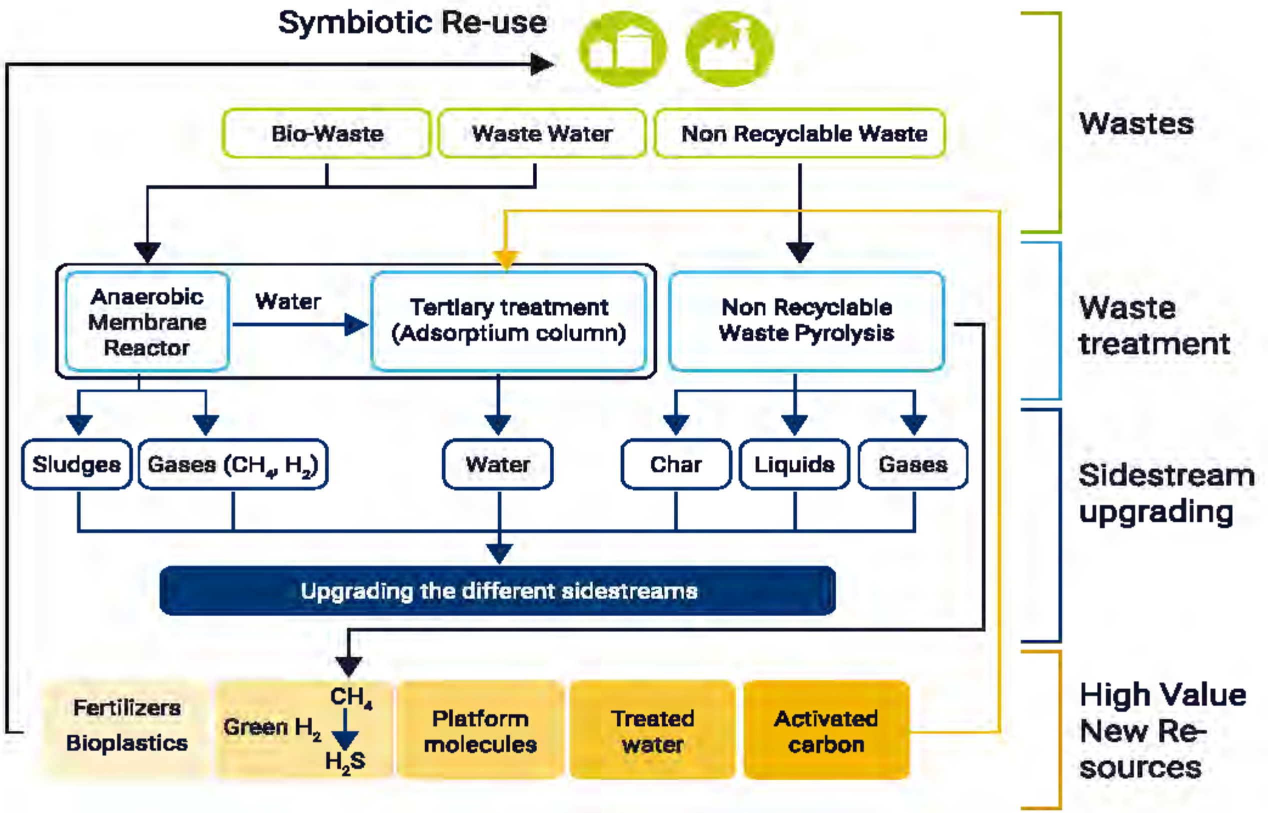
Functionalized AC with LigNPs and/or CDs to remove emerging pollutants.

4 EcoSites WITH THE SAME GOAL

SYMSITES

Enhance recovery of resources, energy and reclaimed water from wastes

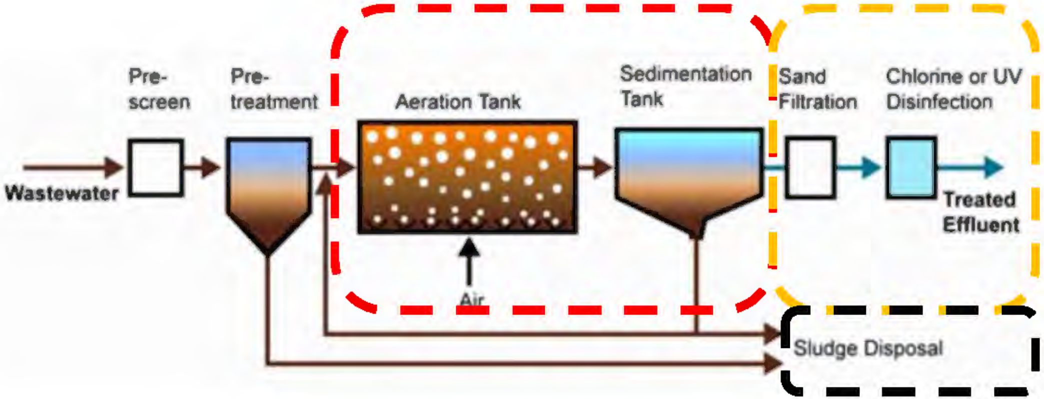
Technologies for water reuse with an I-U Symbiosis perspective

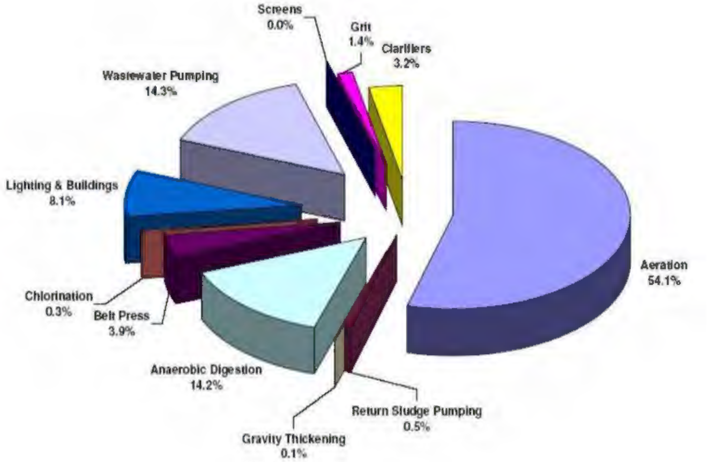


ENERGY PERSPECTIVE OF WASTEWATER TREATMENT

Should we directly apply anaerobic technologies for urban WWT?

Energetic demands in WWTP





Management and regulation restrictions

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INTRODUCING ANAEROBIC MEMBRANE BIOREACTORS

SYMSITES

Pros and cons:

- ✓ Low sludge production due to anaerobic kinetics of the biomass.
- ✓ No need of aeration with air supply.
- ✓ Biogas is produced and can be converted into electricity
- x Large reactors
- x Low efficiency in the separation of biomass

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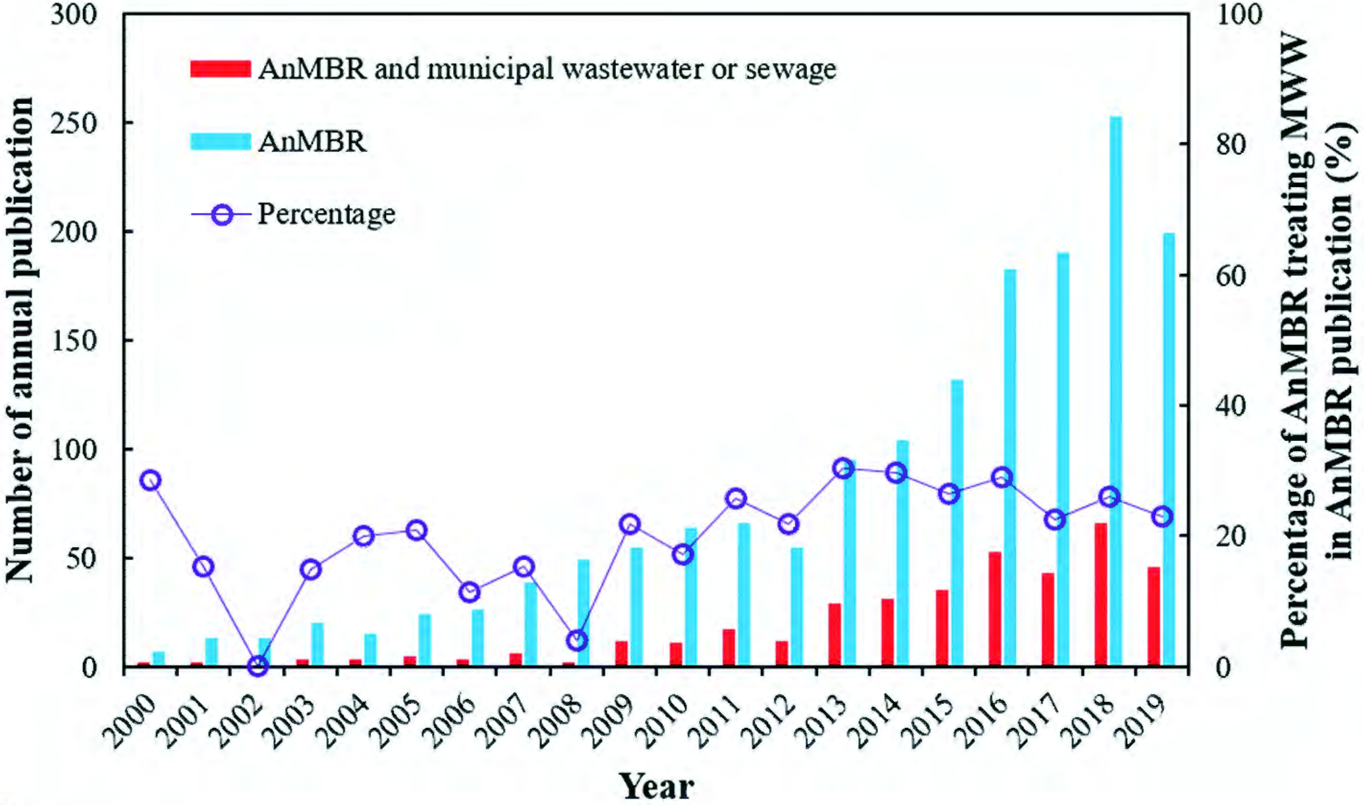
Does AnMBR need "further research"?



Hu et al., 2020. Environmental Science: Water Research and Technology

A REVIEW OF AnMBR PERFORMANCE

SYMSITES

Application to municipal wastewater treatment

↑ Energy if up-grading to H_2

Reference	COD ($g \cdot m^{-3}$)	BOD ($g \cdot m^{-3}$)	TN ($g\ N \cdot m^{-3}$)	TP ($g\ P \cdot m^{-3}$)	%CH_4	%VSS_{sludge}
14	59	14	47.9	6.7	57.2	67.0
121	81	n.a.	44.9	3.9	62.0	59.3
36	70-100	n.a.	38.0-62.1	5.1-10.2	55.0-70.0	66.5-72.4
1	80-116	n.a.	34.2-54.3	6.1-10.3	74.1-77.5	65.8-73.0
38	91	n.a.	47.9	7.7	76.9	70.3
39	58	25	37.0	4.2	68.0	n.a.
37	50	n.a.	34.2	6.5	50.0-70	63.0-75.0
187	39-54	8-16	n.a.	n.a.	70.0-79.6	82.0-84.0

(n.a.: not available)

Fertirrigation or liquid fertilizer production

Biofertilizers
Reduce reagents and management costs

A. Robles, J. Serralta, N. Martí, J. Ferrer and A. Seco, Environ. Sci.: Water Res. Technol., 2021

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DOES AnMBR NEED "FURTHER RESEARCH"?

SYMSITES

Limitations of AnMBR technology

- Municipal wastewater has low COD
- Remaining COD in the effluent
- Dissolved methane losses in the effluent
- Energy recovered from biomethane
- Chemical reagents need for membrane cleaning
- High mineralization of the effluent
- Ultrafiltration membranes mainly retain bacteria

Innovation challenges in SYMSITES project

- Co-digestion in wastewater stream (I-U symbiosis)
- Adsorption column with pyrolised wastes
- Recovery using membrane contactors
- Up-grading to hydrogen
- Magnetic membrane vibration system
- Fertirrigation strategies
- Assessment of microbial risk associated to effluent reuse (virus, bacteria, other pathogens) and new disinfection materials

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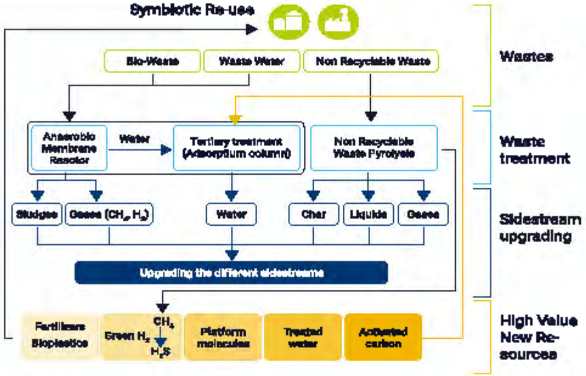
4 EcoSites WITH THE SAME GOAL

SYMSITES

Innovations are needed to maximize AnMBR benefits



AnMBR + Adsorption Column + Biogas upgrading

SPAIN

- Magnetic membrane Vibration (MMV)
- Lignin Nanoparticles
- Methane plus nitrogen recovery as ammonia sulphate

DENMARK

- Coated membranes
- Lignin Nanoparticles

AUSTRIA

- Carbon Dots
- H_2S used for nitrogen recovery as ammonia sulphate

GREECE

- Direct H_2 production
- Carbon Dots
- Coated Membranes

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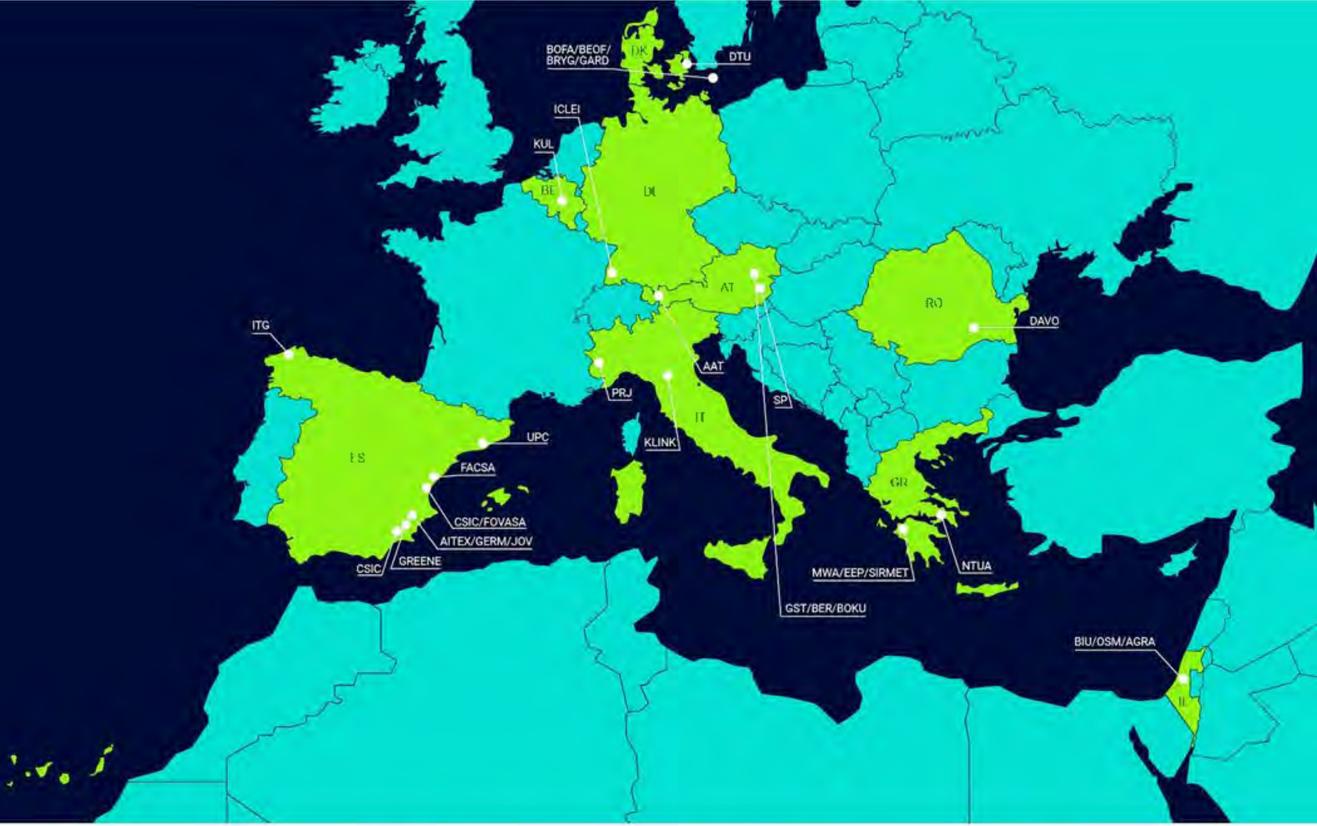
SYMSITES

CONSORTIUM MAP

info@symsites.eu



THANKS FOR YOUR ATTENTION

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#EU GREEN WEEK

EU Green Week Partner Event

Contributing to the circular economy by clean, competitive & industrial-scalable solutions coming from EU-funded projects

01 Circular economy: recycle, reuse, reduce
02 Industrial-urban symbiosis
03 Valorization of waste streams to obtain energy & new resources

LIFE anhidra politex

Co-funded by the European Union

Securing local suppl**Y** chains via the development of new **M**ethods to assess the circularity and symbiosis of the **B**io-b**A**sed industrial ecosystem enhancing the EU competitiveness and resource independence

Project ID

Call: HORIZON-CL6-2023-CircBio-01-7

Type of Action: CSA – Coordination and Support Action

Type of MGA: HORIZON Lump Sum Grant

Grant Agreement number: 101135562

Total Budget: €1,497,842.00

EU Funding: € 1,497,842.00

Starting date: 01 January 2024

Duration: 36 months

Coordinator: Antonietta Pizza

CONTACTS:

Antonietta Pizza

info@symbaproject.eu

www.symbaproject.eu

pizza@enco-consulting.it

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THE CONSORTIUM

9 PARTNERS

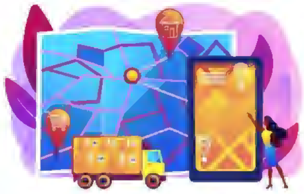
5 COUNTRIES

36 MONTHS

1.497.842,00 €

KEY OBJECTIVES

01



Mapping & Assessing current IS methods and approaches within the bio-based and non-bio-based industries around EU

02

Implementing an innovative IS monitoring system through the support of DI and AI tools

03

Minimizing negative socio-economic & environmental impacts of industrial products' processes, improving and optimizing the local supply chains

04

Supporting local facilitators in the promotion of a new bio-based IS initiative

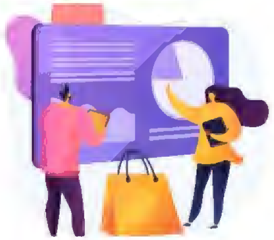
05

Establishing a roadmap for the replication of SYMBA methodology in other regions ensuring long-term sustainability of SYMBA IS

06

Individuating criteria for the selection of specific industrial hubs for SYMBA replicability

07



Accelerating regional, rural, local/urban and consumer-based transitions by developing innovative and sustainable value chains

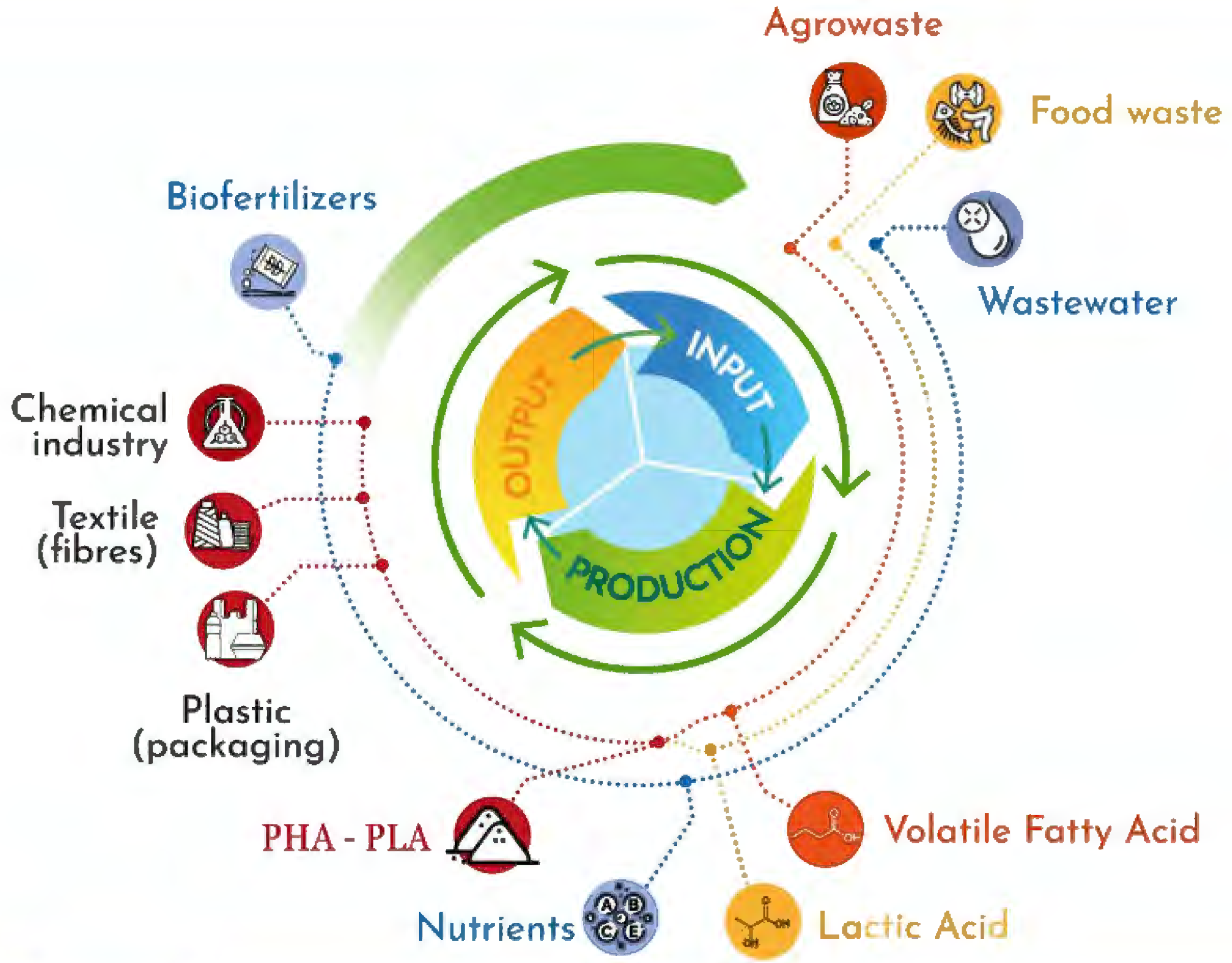
08

Involving and cooperating with clusters and existing EcoPs

APPROACH

1. Knowledge collection and mapping of IS solutions
2. Classification
3. Development of New Circular Symbiosis Methodology
4. Set-up Criteria for Individuating Regional Hubs and Defining regional needs' assessment
5. Monitoring and Validation through AI data-driven models
6. Co-creation; cooperation; knowledge sharing

SYMBA PILOTS



NOVAMONT A Versalis Company

Bio Base Europe Pilot Plant

AIMPLAS INSTITUTO TECNOLÓGICO DEL PLÁSTICO

CETAQUA CENTRO TECNOLÓGICO DEL AGUA

CENTEXBEL

circe

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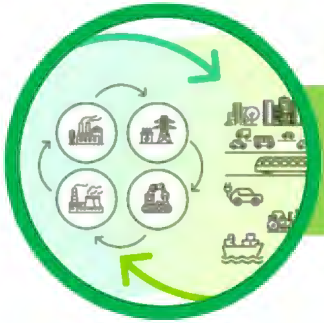
SYMBA SYNERGIES

01
SYMBA Forum cross-exchange with ongoing projects

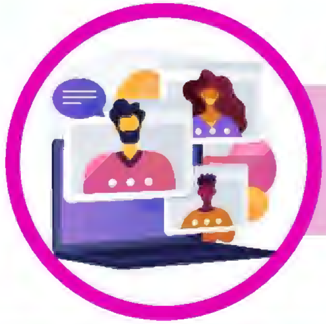


02
Virtual meetings and training sections with the H4C community

New European Bauhaus

03
Training sessions and interaction with NEB community

04
Synergies and networking with other Projects & Initiatives



05
Social Science and Humanities Integration

WORKPLAN

PERIOD 1 (M1-M18) | **PERIOD 2 (M19-M36)**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

WP1 – Management & Coordination

WP2 – Management & Coordination

WP3 – Exploring existing IS solutions

WP4 – Innovative models and IS approaches in the bio-based value chains

WP5 – Identification of high potential IS regions to demonstrate the SYMBA approach

WP6 – Cooperation with H4C ECoP, other existing initiatives, HE and CBE-JU projects and the NEB community

WP7 – Increased cooperation with H4C ECoP, other existing initiatives, HE and CBE-JU projects and the NEB community

WP8 – Communication, Dissemination, Exploitation

WP9 – Communication, Dissemination, Exploitation

EXPECTED OUTCOMES 1/2

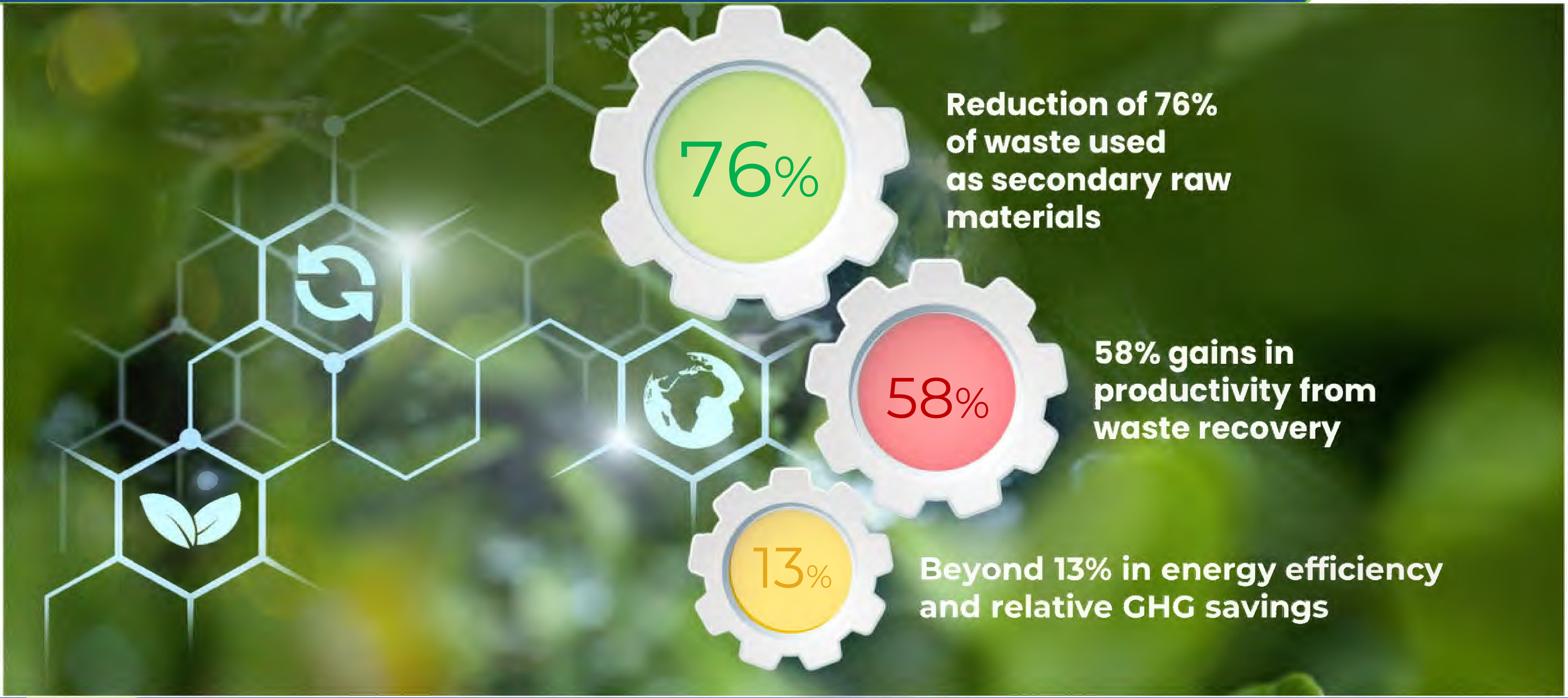
1. EU Map of current existing IS approaches & methodologies
2. IS monitoring system based on the cocreation approach
3. Database, including AI tools, with all generated and collected knowledge
4. LCA – LCC – SLCA pre and post SYMBA
5. 2 Policy Briefs

EXPECTED OUTCOMES 2/2

SYMBA

1. Roadmap to setting-up new synergies with ongoing initiatives and among stakeholders
2. Set of criteria to select industrial hub for replicability
3. SYMBA waste relationship regional maps
4. Synergies and cooperation with existing projects and initiatives
5. Innovative circular business models and post project roadmap

EXPECTED OUTCOMES



SYMBA Advisory Board

- 9 experts
- NDA signed by each expert defining confidentiality and obligations of each party
- Signed Informed Consent Form to publish summary of the AB activities, including names, surname, affiliation and a short bio of the AB members on SYMBA website and social media pages
- An email will follow with a template to collect this info
- Online meeting twice per year
- Up to 1-hour offline work may be required by the AB members before each meeting to manage and respond to questionnaires and other tasks
- To assess the project efficiency and alignment with the target market's needs
- AB members have the opportunity to introduce their company, share their activities and present some of their best practices

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EU Green Week Partner Event

Contributing to the circular economy by clean, competitive & industrial-scalable solutions coming from EU-funded projects

The project LIFE WASTE2GOAG has received funding from the LIFE programme of the European Union under the Grant Agreement no LIFE20 ENV/ES/000430

01 Circular economy: recycle, reuse, reduce

02 Industrial-urban symbiosis

03 Valorization of waste streams to obtain energy & new resources

LIFE anhidra politex

Co-funded by the European Union

WASTE2COAG

Brine and Metal Wastes Valorisation to Produce Coagulants for Wastewater Treatment

Brine and metal waste valorization to produce coagulants for wastewater treatment

Laura Grima Carmena

June 2025

AIDIMME
TECHNOLOGY INSTITUTE

The project LIFE WASTE2COAG has received funding from the LIFE programme of the European Union under the Grant Agreement no LIFE20 ENV/ES/000430

Project partners

LIFE W2C

Start: 01/10/2021

End: 30/09/2025

Total amount: 1,564,295 €

Context

Problem to solve

Wastes

Brines & Scrap metals

Valorisation

Reagents

Coagulants

Brines

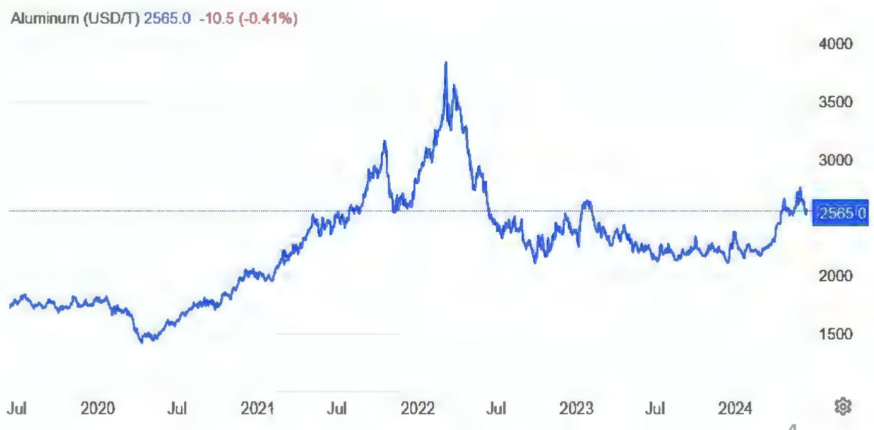
- High generation (desalination plants >100M m^3/d worldwide)
- Discharged without treatment - Environmental impact

Metals

- Scarcity of resources
- Price

Coagulants

- High consumption worldwide (Urban and industrial WWTP)
- Outsource - Continuous price increments – expected to increase



W2C SOLUTION

Based on electrolysis

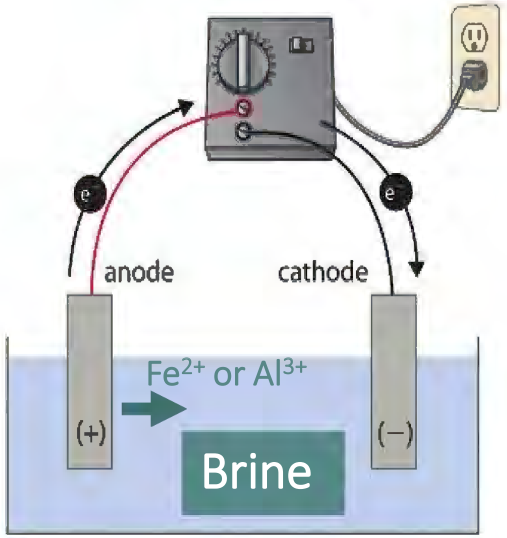
- Apply a continuous electrical current to two metal electrodes immersed in a solution to cause a non-spontaneous chemical change.
- Anode (sacrificial electrode):

Steel: substitute of commercial $FeCl_3/FeCl_2$.

$$Fe - 2e \rightarrow Fe^{2+}$$

Aluminium: substitute of commercial PAC.

$$Al - 3e \rightarrow Al^{3+}$$



Lower electrical consumption

The higher conductivity of brines allows the application of lower voltages

W2C SOLUTION

Multi-sector approach

INPUTS

Scraps metals (Fe and Al)

Brines (Desalination and industrial)

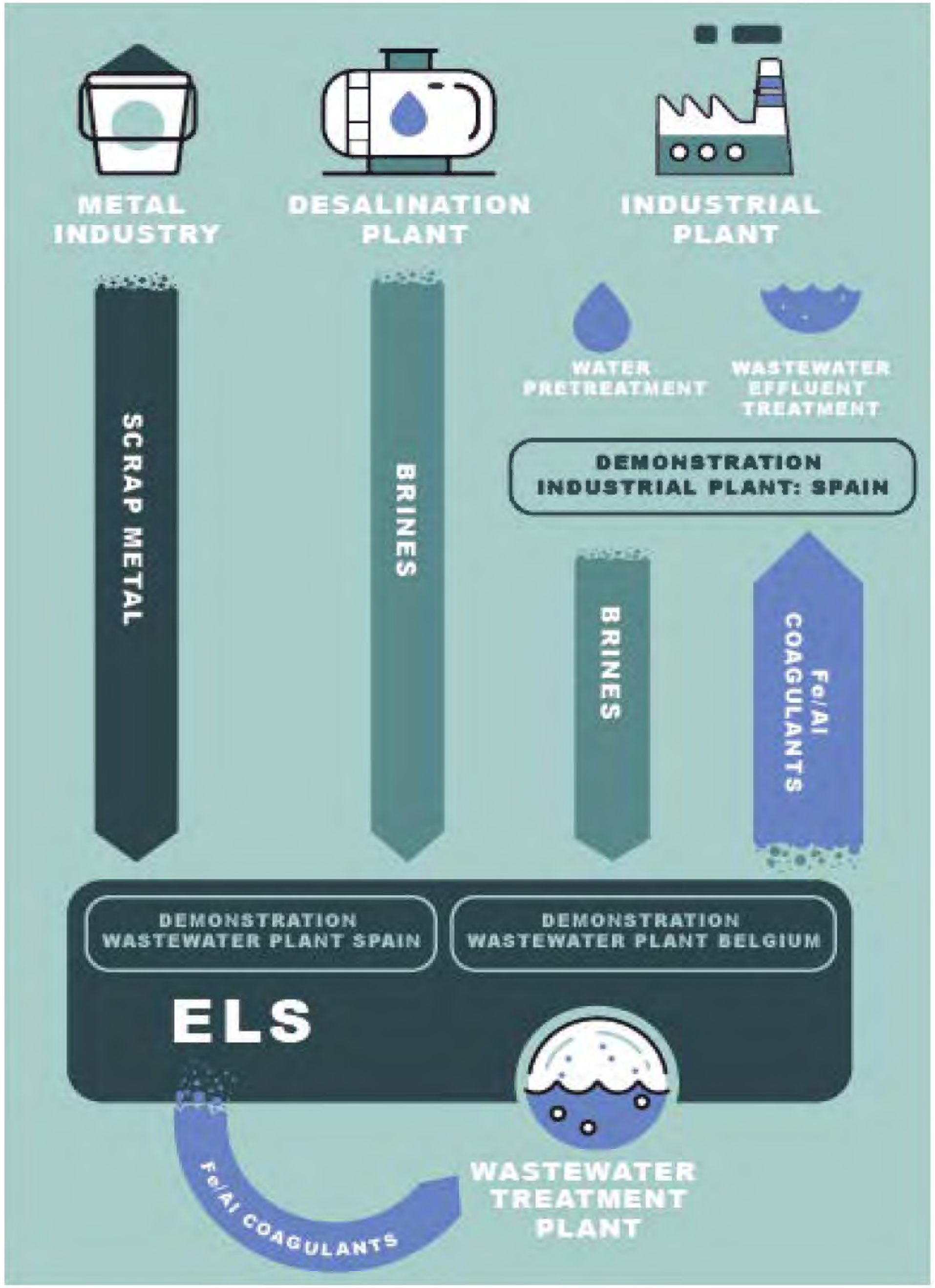
PROCESS

ELectrolytic System (ELS)

OUTPUT:

WWTPs Reagents

Valorization of brines and scraps



Technical overview

Coagulation for WWT

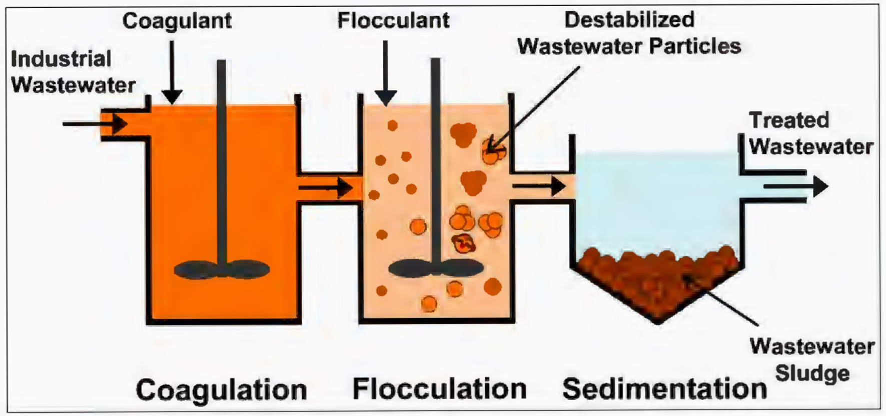
Coagulation for WWT

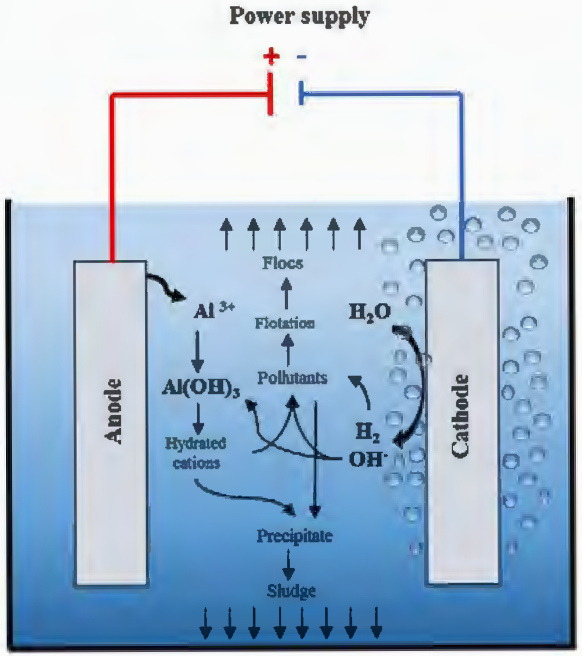
COAGULATION

Addition of reagents

ELECTROCOAGULATION (EC)

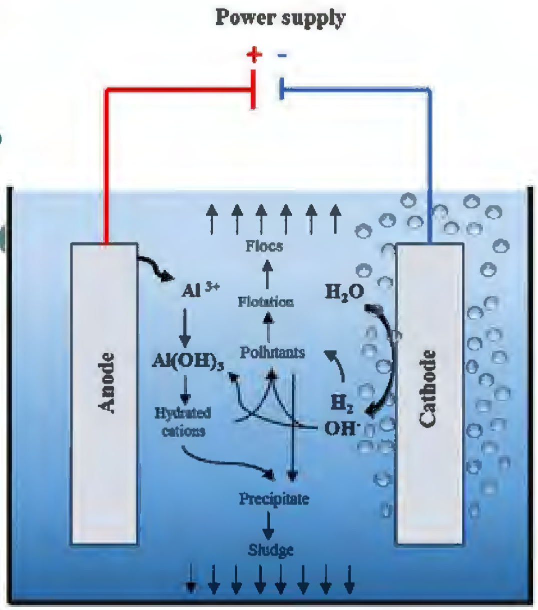
Electrochemical coagulation

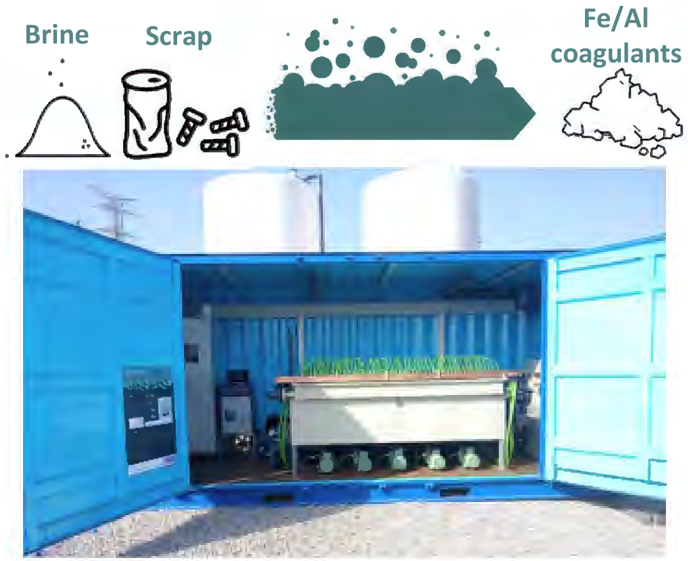




Technical overview

EC vs. ELS





		Electrocoagulation (EC)	LIFE W2C Electrolytic System (ELS)
≠	Objective	WW treatment	Produce coagulants, valorise wastes
	Electrodes	Commercial	Metal Scraps (cheaper+environment)
	Electrolyte	Waste water	Brines (conductivity+environment)
	Versatility	Standard	Wide range qualities received/delivered
=	Easy to operate	✔	✔
	No reagents (less sludge)	✔	✔
>	Commercial coagulant	No	✔
	Waste valorisation	No	✔
	Low power consumption	No	✔

Validation in industrial WWTP

Results

Demineralization Equipment

Current name	Stage	Column	Time (min) EQ 2
1C	Backwash	Cationic	9'
2C	**HCl Injection**	Cationic	20'
3C	**Slow Rinse**	Cationic	0'
4C	**Fast Rinse**	Cationic	5'
5C	Backwash	Anionic	10'
6C	NaOH injection	Anionic	30'
7C	Slow Rinse	Anionic	45'
8C	**Fast Rinse**	Anionic	9'

- ✓ Separate each stream
- ✓ Optimum mixture
- ✓ Feed the ELS with that mix.
- ✓ Coagulants produced
- ✓ 70% of brines Valorized

Industrial WWTP

Parameter	Avg. Yield η (%)	Meets Limits
Cu (mg/L)	98	✓
Ni (mg/L)	92	✓
Zn (mg/L)	99	✓
Cr (VI) (mg/L)	96	✓
pH (u pH)	-	✓
Cond. (μs/cm)	-	✓

Conclusions

- Problem: Brines, metals and coagulants
- Valorization of wastes into reagents
- Overview of the Electrolytic System
- Industrial validation

► Open to new collaboration opportunities
We welcome your WW or brines to test them
Feel free to contact us!

WASTE2COAG

Brine and Metal Wastes Valorisation to Produce Coagulants for Wastewater Treatment

Laura Grima
LGRIMA@AIDIMME.ES

THANKS FOR YOUR ATTENTION

June 10th, 2025 - Online

10:00am – 12:00pm CEST

#EU GREEN WEEK

EU Green Week Partner Event

Contributing to the circular economy by clean, competitive & industrial-scalable solutions coming from EU-funded projects

01 Circular economy: recycle, reuse, reduce
02 Industrial-urban symbiosis
03 Valorization of waste streams to obtain energy & new resources

LIFE anhidra politex

Co-funded by the European Union

VALORISATION OF CELLULOSIC FIBRES COLLECTED FROM THE ANHIDRA’S WATER TREATMENT LOOP

Víctor Herráez
R&D Project Technician
victor.herraez@aitex.es

#EUGREENWEEK

CONSORTIUM

PIZARRO

Guimarães, Portugal

Textile finishing company

Jeanologia
The Science of Finishing

Valencia, Spain

Development of sustainable technologies for the finishing textile industry

aitex

Alcoy, Spain

Textile research institute, with laboratory servicies and R&D projects

PIZARRO

Textile finishing company

Laundry, dyeing, finishing and printing

Denim Washing

Denim garments require special colour/effect looks

- Stone washing
- Enzime washing
- Acid washing
- Bleaching
- Whiskering

https://pizarro.pt/servicos/#producao

OBJECTIVES OF THE PROJECT

LIFE ANHIDRA project aims to demonstrate new sustainable garment's finishing processes thanks to the innovate **water regeneration loop**.

The water is conditioned "in situ" for being reused in the process, avoiding the 98% of the WW discharge to the environment.

Water treatment of ANHIDRA system

Environmental benefits:

- Dehydrate textile finishing industry
- Water reuse
- Avoid discharges
- Re-use of textile fiber waste
- Operational good practices

LCA Analysis Results

INDICATOR	SAVINGS
WATER INLET	92%
WATER DISCHARGE	98%
GWP	44%
WATER DEP.	85%

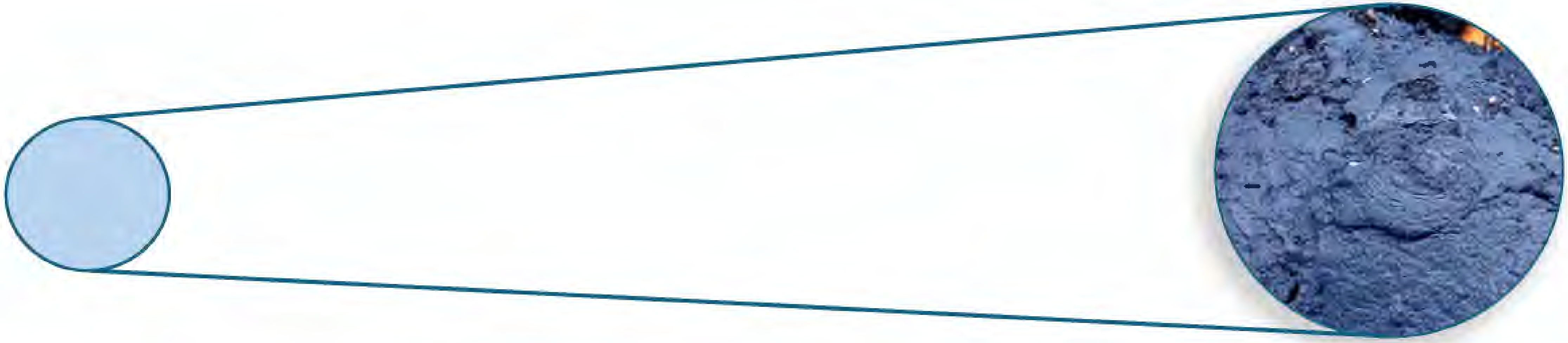
LIFE ANHIDRA WATER REGENERATION LOOP

VALORIZATION OF FIBERS BASED ON CIRCULAR ECONOMY

Main fiber-based wastes generated and collected along the ANHIDRA system. What could we do with them?

Fibre waste is collected from **mechanical filtration** system:

- Prefilter
- 1^{st} Filter (500 μm)
- 2^{nd} Filter (50 μm)



VALORIZATION OF FIBERS BASED ON CIRCULAR ECONOMY

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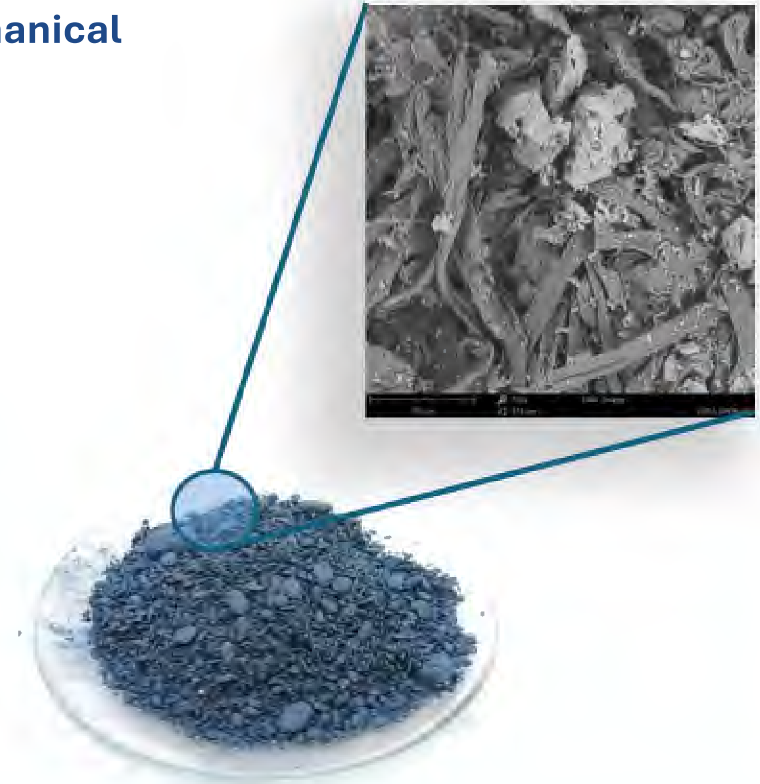
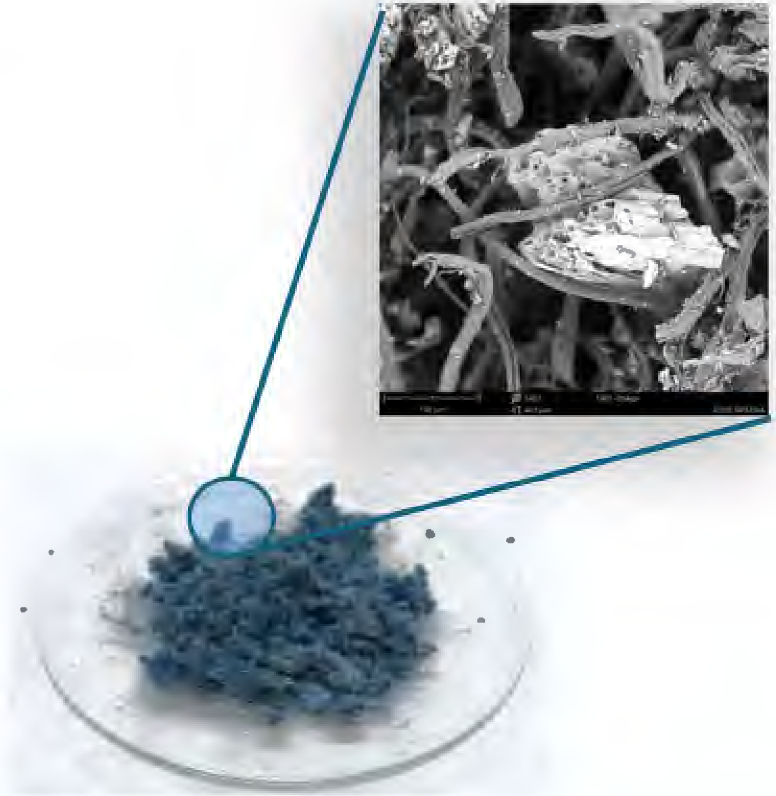
Pre-filter fibre waste



1st filter fibre waste



2nd filter fibre waste

VALORIZATION OF FIBERS BASED ON CIRCULAR ECONOMY

Main fiber-based wastes generated and collected along the ANHIDRA system. What could we do with them??

VALORIZATION ROUTES CONSIDERED

1. Fiber waste transformation into a **pigment**
   1.1. **Exhaust dyeing** application.
   1.2. **Coating/printing** application.
2. **Energy valorisation** through anaerobic digestion for methane generation
3. Other **potential routes**

#EUGREENWEEK

VALORIZATION OF FIBERS BASED ON CIRCULAR ECONOMY

Pigment-like powder for coating, printing or dyeing

SIZE REDUCING PROCESS IN SITRRED BALL MILL

Anhidra dried fiber waste

Dry Process

Stirred ball mill

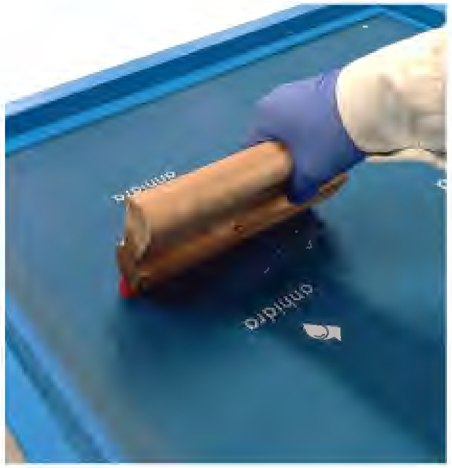
Wet Process

Wet milling paste

Spray drying

Dyeing

Printing



Particle size reduction:

- Dry process: 55%
- Wet process: 98%

Sample	Dx (10) (µm)	Dx (50) (µm)	Dx (90) (µm)
ANHIDRA fiber waste	17.6	66.8	393
Dry process	8.59	34.5	177
Wet process	0.97	3.33	7.42

VALORIZATION OF FIBERS BASED ON CIRCULAR ECONOMY

Pigment-like powder for coating, printing or dyeing

Pigment Dyeing

Fabric dyed with pigment from Anhidra waste

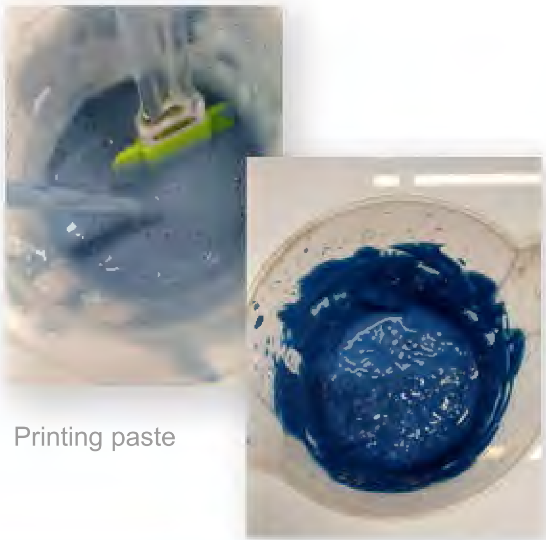
- Use of pigment for dyeing in exhaution processes
- Replacement of synthetic pigments
- Distressed-look garments

Commercial pigment-dyed garments

Coating/Printing Process

Fabric coated with Anhidra pigment

- Application of pigment in printing paste
- Use in coating or screen printing
- Replacement of synthetic pigments



Printing paste

VALORIZATION OF FIBERS BASED ON CIRCULAR ECONOMY

Pigment-like powder for coating, printing or dyeing

Prototypes

Garments dyed with
LIFE ANHIDRA pigment

Coated fabrics with
ANHIDRA pigment
treated with laser

Printed fabrics with
ANDHIRA pigment

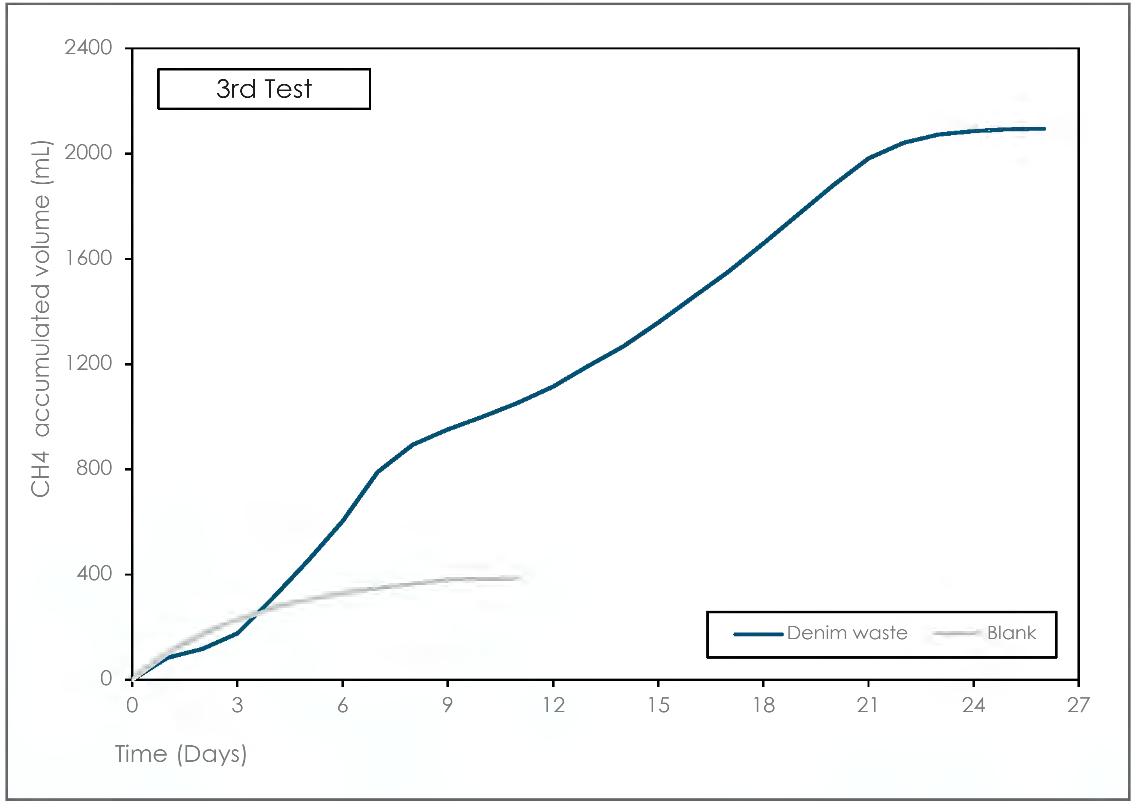
VALORIZATION OF FIBERS BASED ON CIRCULAR ECONOMY

Energy valorisation though methane production

BMP test in anaerobic digestor

Anaerobic Digestion

Equipo BPM (BPC Instruments, Sweden)



Biochemical methane production (BMP): Allows to know the quantity of methane that a substrate can produce, and to study biodegradability

Using anaerobic reactor inoculum from WWTP, bacteria can utilize the cellulose present in the waste to produce methane.

VALORIZATION OF FIBERS BASED ON CIRCULAR ECONOMY

Other considered routes

Composite formation

Clothes hanger made from ANHIDRA waste

Viscose fiber

- Cutting/gringind and panels by **hot press plates.**
- Nonwovens for composites and panels (by **wet-laid technology**).
- Reinforcement for **composites.**
- Chemical transformation to obtain new **cellulose based yarns.**

THANK YOU FOR YOUR ATTENTION

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