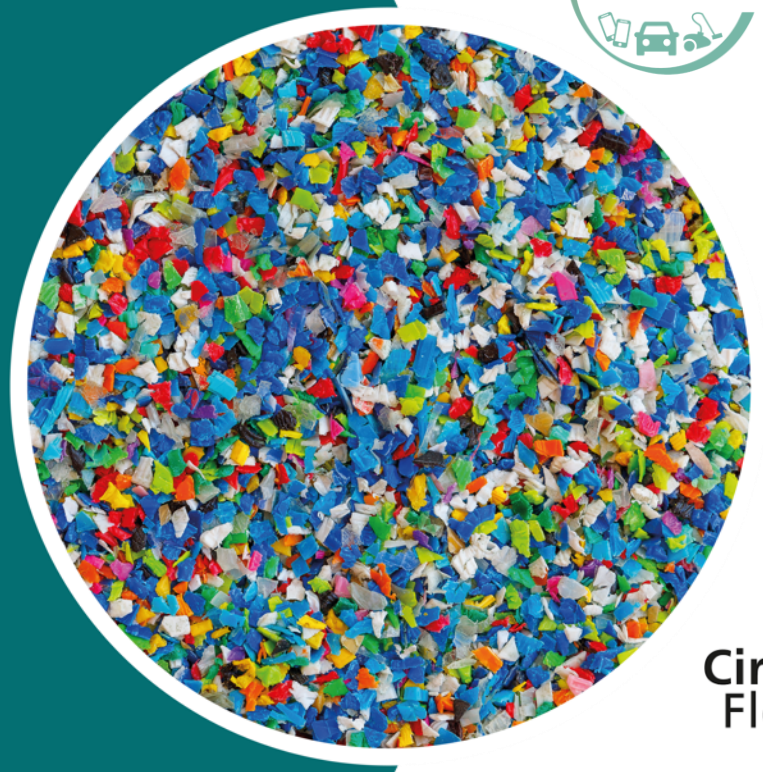
#PlasticRecycling



Recycling of plastics.
Towards a more sustainable plastic treatment in 2030

1 July 2021, 10:00 – 12:00 CEST

Housekeeping

- This event is being recorded in its entirety. A link to the full recordings will be shared with participants afterwards
- All the presentations will be available at the HRB NONTOX project group members' websites
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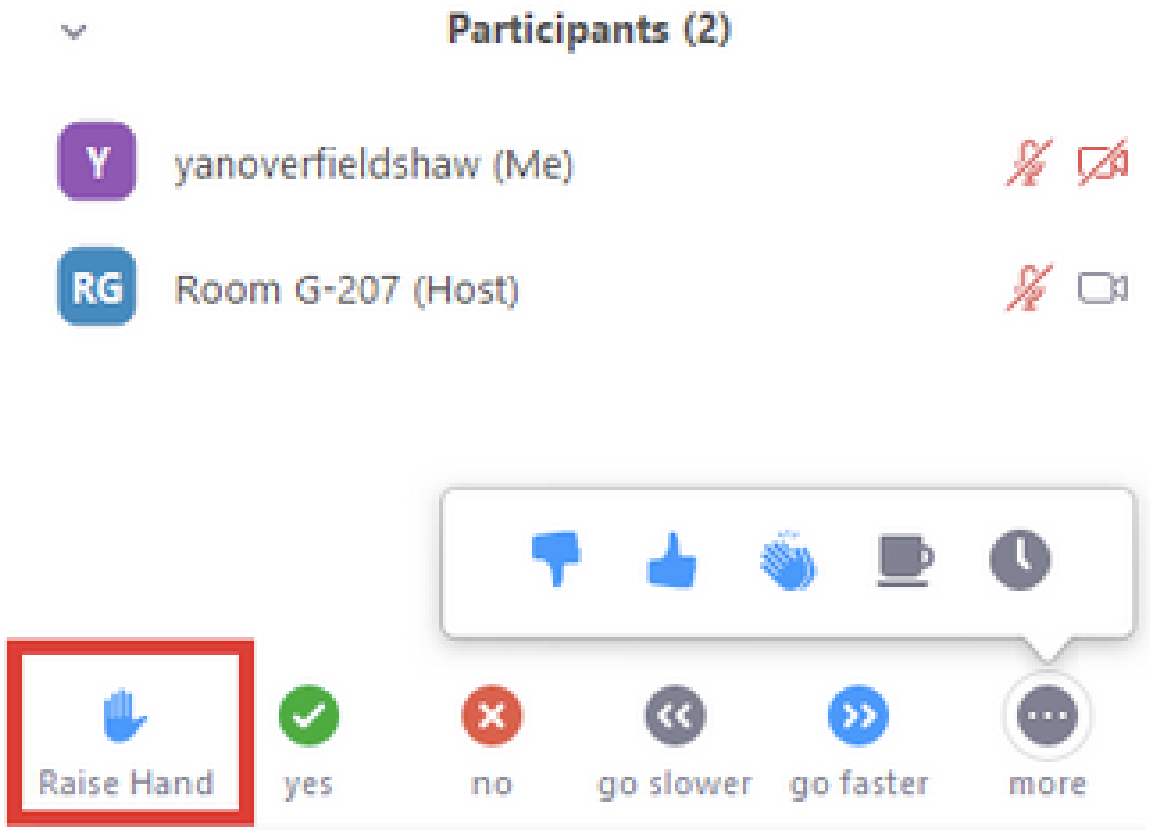


Agenda

10:00 – 10:05 **Welcome and introduction** - Mariana Fernandez, Sustainable Innovations & PLAST2bCLEANED

Session 1 - Viewpoints from the projects (10:05 – 11:20)

10:05 – 10:20 **NONTOX: NONTOX: Toolbox of technologies to recycle the hazardous plastics -** Muhammad Saad Qureshi, Senior Scientist, VTT-Technical Research Centre of Finland and Project Coordinator at NONTOX EU project.

10:20 – 10:35 **PLAST2bCLEANED: recycling of ABS and HiPS, bromine and antimony trioxide from WEEE plastics** - Esther Zondervan-van den Beuken, Senior Consultant Plastics at TNO and PLAST2bCLEANED Coordinator

10:35 – 10:50 **CREAToR: Collection of raw materials, removal of flame retardants and reuse of secondary raw materials –** Irma Mikonsaari, Project Manager at Fraunhofer Institute for Chemical Technology and CREAToR Coordinator

10:50 – 11:05 **CIRCULAR FLOORING: Recycling PVC from post-consumer flooring waste** - Thomas Diefenhardt, Associate Scientist at Fraunhofer IVV and Circular Flooring Coordinator

11:05 – 11:20 **REACT: Management of waste acrylic textiles coming from outdoor awnings and furnishing,** Roberto Vannucci – Multisectoral R&I Dpt. Manager, Centrocot

Agenda

Session 2 - Interactive discussions (11:20 – 11:55)

11:20 – 11:50  Interactive discussion based on selected questions

11:50 – 11:55  Interactive polling with participants

11:55 – 12:00  Wrap-up of main takeaways and Calls to Action

NONTOX - Increasing recycling rates of plastics waste containing hazardous substances. Developing and optimising recycling processes for safe and high-quality secondary plastic materials.
nontox-project.eu

Grant Agreement No.820895

CREAToR - Removing hazardous, already banned bromine-containing flame-retardants from waste streams using continuous purification technologies: supercritical CO2 and cost-effective solvent-based processes. **creatorproject.eu**

Grant Agreement No.820477

PLAST2bCLEANED - Developing a human and environmentally safe recycling process for Waste Electrical and Electronic Equipment (WEEE) plastics in a technically feasible and economically viable manner by closing the loop of polymer and flam retardants.
plast2bcleaned.eu

Grant Agreement No.821087

CIRCULAR FLOORING - Recovery of a PVC compound from post-consumer PVC floor coverings and the separation of legacy plasticisers with the innovative, patented CreaSolv® process in order to create a recycled material for the manufacturing of new PVC floor coverings (comment Melanie, CF).
circular-flooring.eu

Grant Agreement No.821366

REACT - Recycling of waste acrylic textiles. Ensuring the safe utilisation and disposal of removed substances.
react-project.net

Grant Agreement No.820869

The **HRB - Horizon Result Booster** is an initiative funded European Commission, Directorate General for Research and Innovation, Unit J5, Common Service for Horizon 2020 Information and Data.

Capture QRcode or follow this URL
horizonresultsbooster.eu

NONTOX

Toolbox of Technologies to Recycle The Hazardous Plastics

This project has received funding from European Union's Horizon 2020 research and innovation programme under grant agreement N°820895

Muhammad Saad Qureshi – Project coordinator

Recycling of plastics. Towards a more sustainable plastic treatment in 2030, 1st July 2021

Agenda

- NONTOX in short
- The challenge
- The NONTOX concept
- The impacts
- Policy recommendations

NONTOX in short

Budget 5 million euros

Duration 3 years (2019-2022)

The NONTOX value chain → 12 partners from 7 European countries

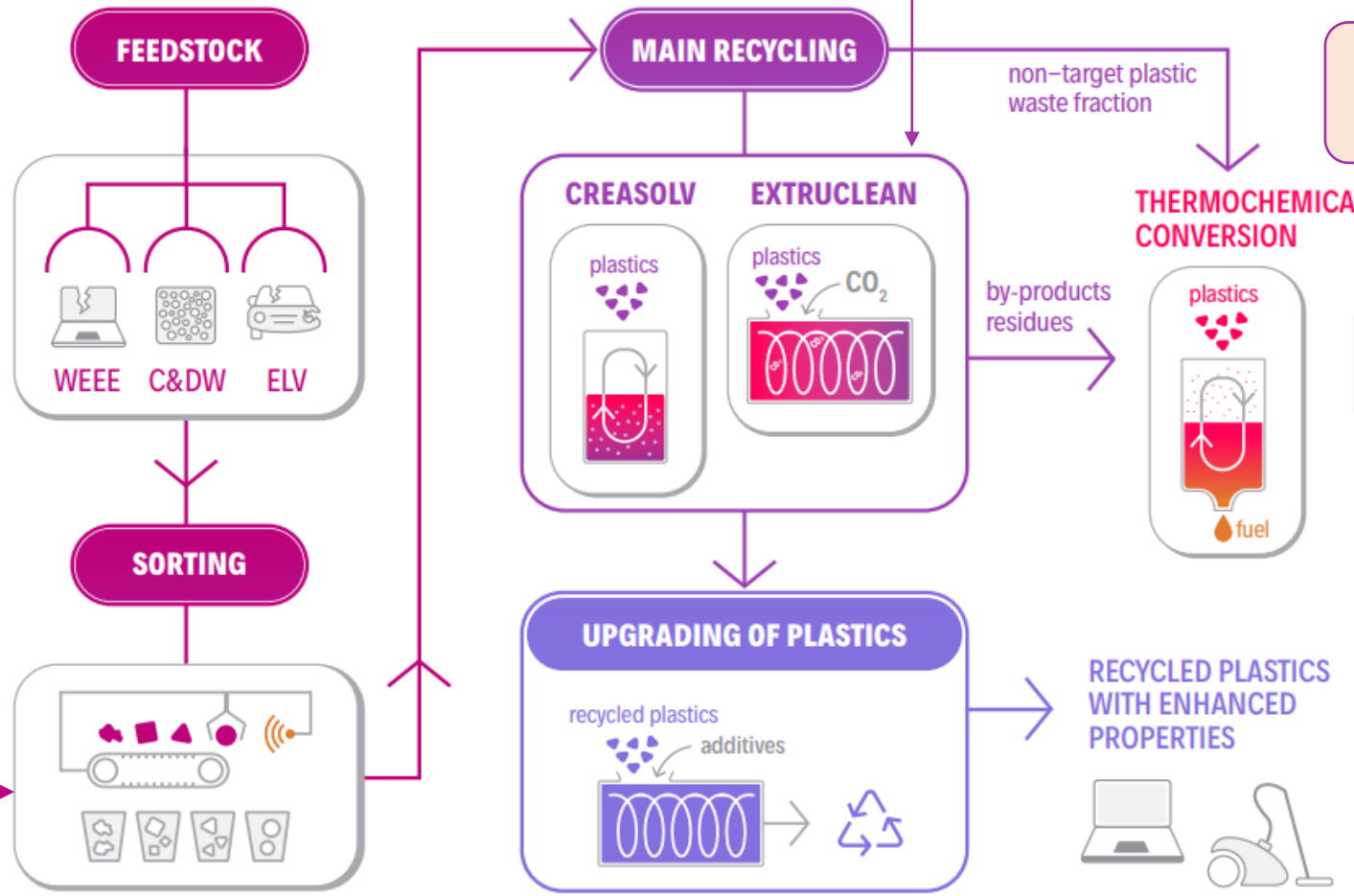
- collection scheme (manufacturers' representative)
- treatment plants
- research technology organizations
- universities

The challenge - Saving valuable plastics

How much potential hazardous waste (WEEE, CDW, ELV) plastic is sent to incineration each year in Europe?

Toolbox of Technologies

NONTOX concept



Physical and mechanical recycling

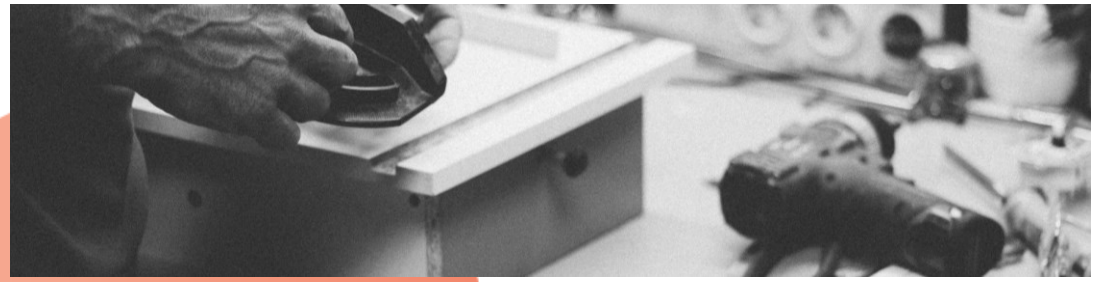
Pyrolysis to treat the most difficult residues

Upgrading technologies to impart virgin like properties to recycled plastics

VTT

Intelligent sorting using AHS sensor

Potential impacts of NONTOX



2.18 Million tonnes of plastics recycled each year in EU

Up to **74%** increase in the recycling capacity

2.1 Million tonnes of greenhouse gas emissions avoided

Three-fold increase in jobs in the recycling sector

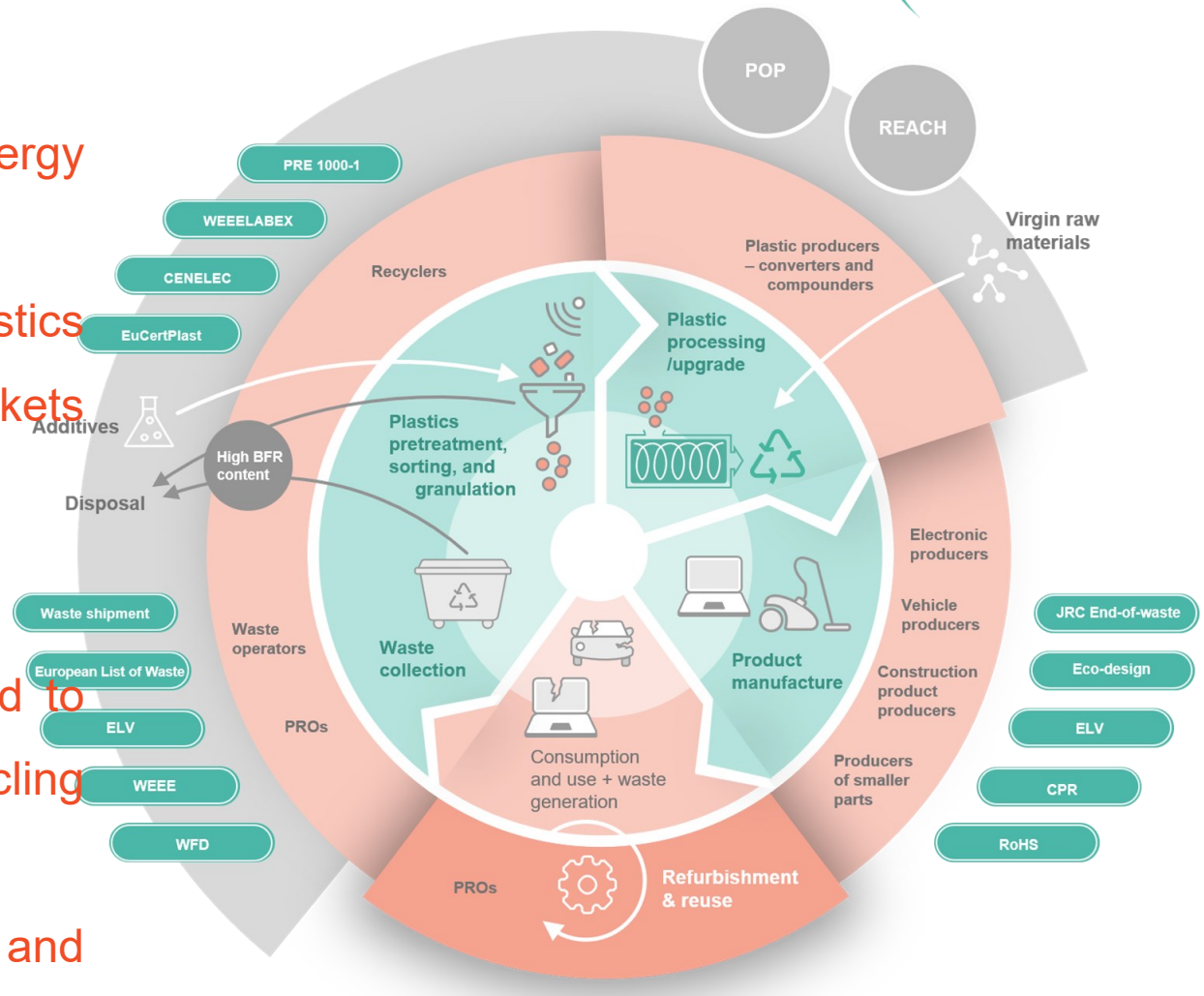
Policy recommendations

Most important finding

1. The current eco-design legislation promotes energy efficiency rather than material efficiency
2. The introduction of end-of-waste criteria for plastics could harmonize and facilitate exchange in the markets (EU and non-EU market).

Key policy message

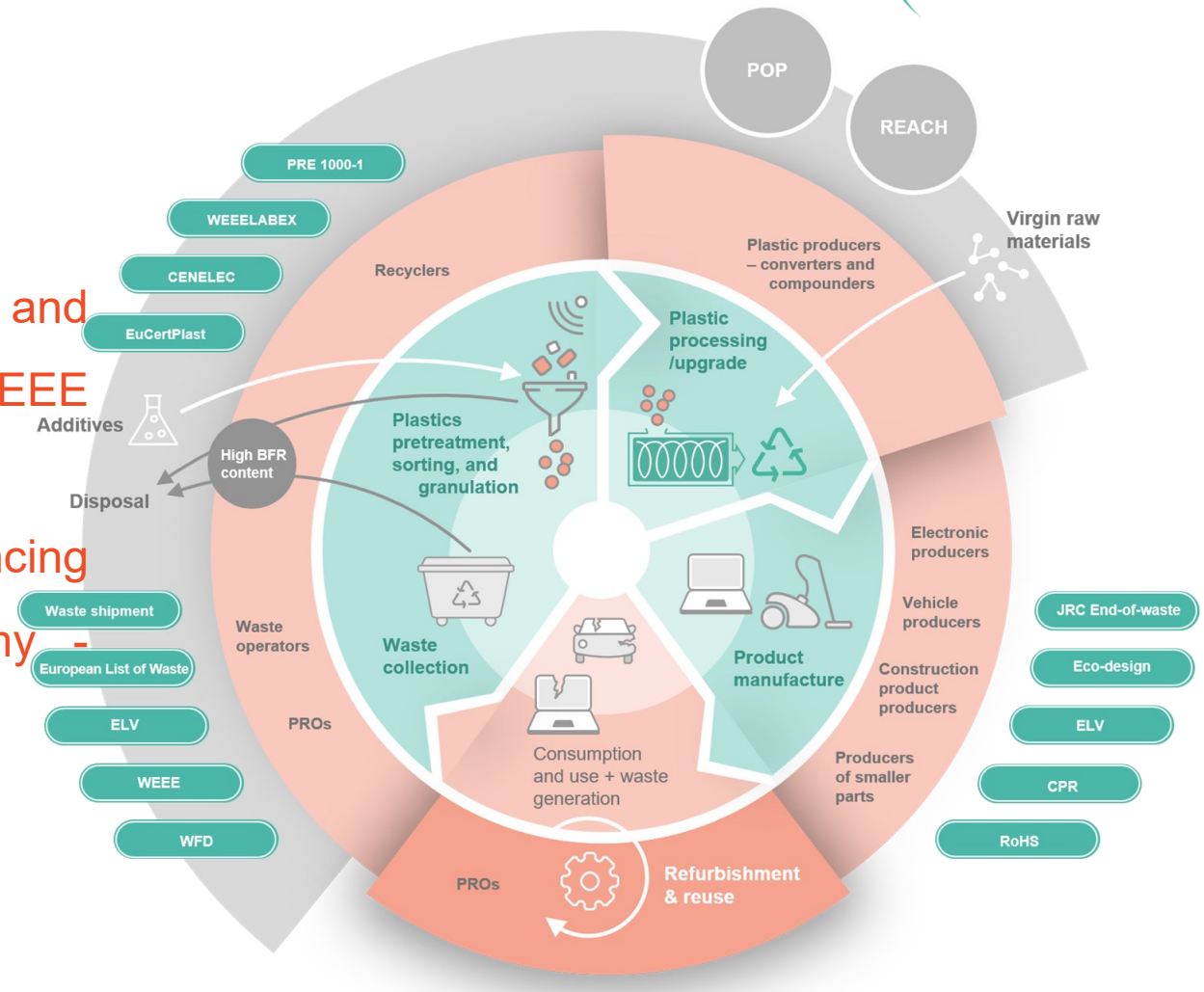
1. Eco-design directive should include aspects related to recyclability. Design FOR recycling and FROM recycling should be considered.
2. Strong cooperation and relationship between waste and chemical legislation should be fostered



Policy recommendations

Future activities

1. Development of a report on eco-design criteria and guidelines for recyclability specifically for ELV, WEEE and C&DW - deliverable
2. Development of a report on actions for enhancing circularity to reach the circular plastic economy - deliverable



Official website

- ***Progress & Resources*** with project materials
- Opportunity of **subscription to the newsletter** in the Contact section

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Public Deliverables

Publications and other articles / By admin / May 27, 2021

NONTOX Deliverable 1.4 Procedure for safe working with contaminated materials Download

NONTOX Deliverable 1.6 Mapping of feedstock Download

NONTOX-Deliverable 5.1 Review on operational environment Download

NONTOX

http://nontox-project.eu/

Follow us

Thanks for the attention

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PLAST2bCLEANED

Esther Zondervan – Program Manager Circular Plastics - TNO
Mail: esther.zondervan@tno.nl
www.tno.nl

This Project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N. 821087

Objectives

The overall aim of PLAST2bCLEANED is to develop a human and environmentally safe recycling process for Waste Electrical and Electronic Equipment (WEEE) plastics in a technically feasible and economically viable manner.

1 **Development of a mechanical presorting technology**

2 **Closing 3 loops using dissolution under superheated conditions by separation of :**
- **(1) the polymer**
- **(2) the bromine**
- **(3) the antimony trioxide**

3 **Process integration and scale-up**

4 **Performance testing of process and products**

5 **System optimizing for sustainability and economic viability**

This Project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N. 821087

CONSORTIUM

This Project has recived funding from the European Union's Horizon 2020 Research and Innovation Proramme under Grant Agreement N. 821087

Team

This Project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N. 821087

Impact

80%
Desired recovery yield

8%
Increased recycling rate

40% reduction
kton CO2 emissions saved

Closing
3 loops
Recycling of polymers, antimony and bromine flame retardants

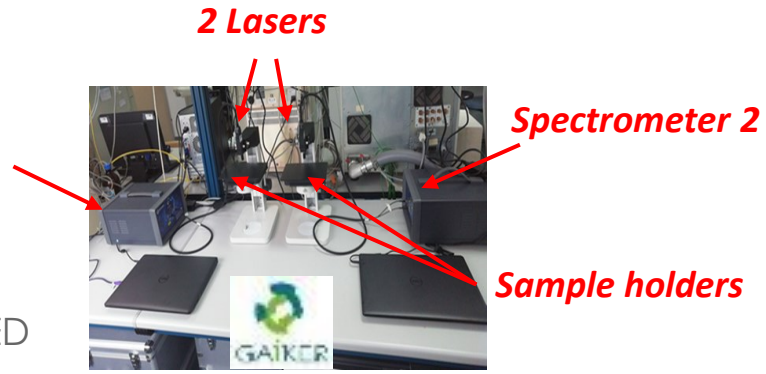
Profitability

This Project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N. 821087

Pre-process: sensing and sorting

Aim of WP1: DESIGN A PRE-TREATMENT AND SORTING PROCESS to provide separate and clean polymers (ABS and HIPS) from WEEE streams

- To identify all coloured polymers (including blacks)
- To sort ABS & HIPS for upgrading in other WPs

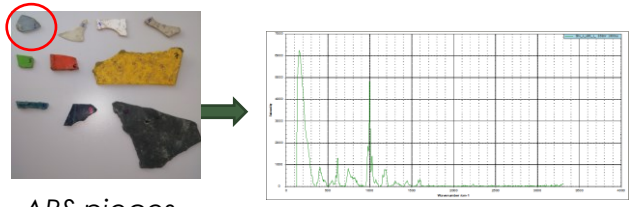


✓ RAMAN equipment set-up & training

✓ Experimental tests with RAMAN spectroscopy: spectral library for PLAST2bCLEANED

1. Identification tests with reference materials:

2. Spectral analysis of real WEEE samples (ABS & HIPS). First results:
   - Defined peaks in some transparent and/or clear samples
   - Fluorescence interference observed in some pieces (dark samples, clear coloured samples with fluorescent additives)
     - ➢ On-going research on polymers identification and to eliminate fluorescence



ABS pieces

3. Chemometric analysis of the spectral data of the real samples has been explored

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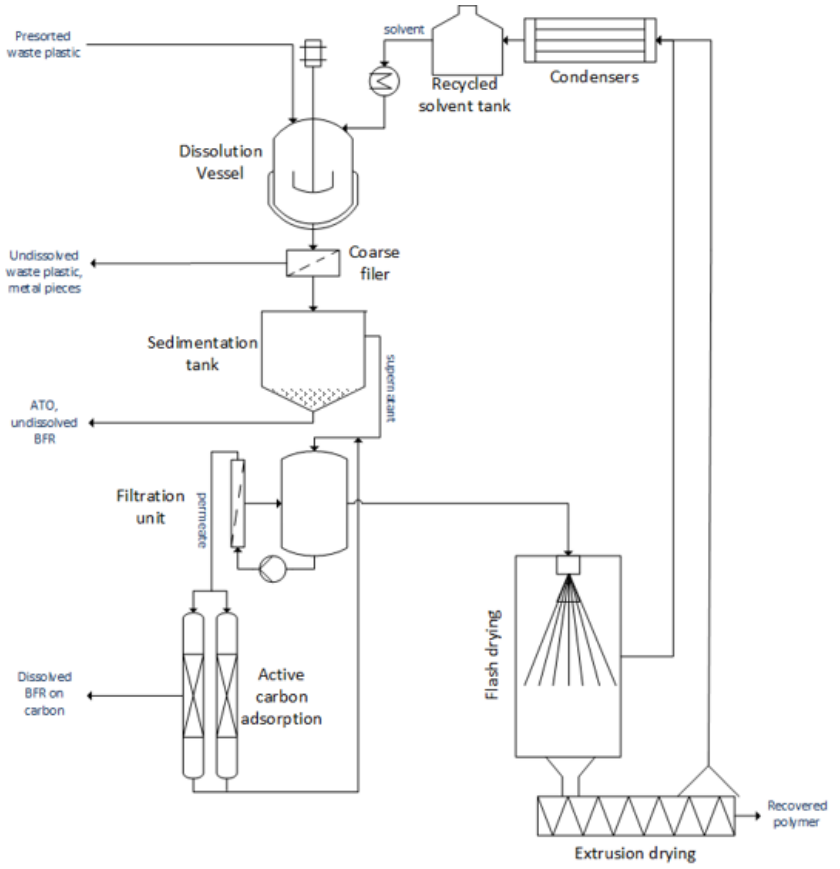
Process development

PLAST2bCLEANED

- Dissolution of HIPS respectively ABS
- Separation of the bromine (Brominated Flame Retardants, BFRs) and antimony trioxide (ATO) additives
  - With high yield
  - Recovery of ATO with low levels of organic contaminants
  - Recovery of BFRs with low levels of inorganic contaminants
- Recovery of solvent and polymer samples
- Lab scale development as preparation for scaled-up demo TRL 5/6
- Möbius concept



Started with test samples with known composition

HiPS + 12% soluble BFR + 4% ATO	ABS + 12% soluble BFR + 4% ATO
HiPS + 12% insoluble BFR + 4% ATO	ABS + 12% insoluble BFR + 4% ATO

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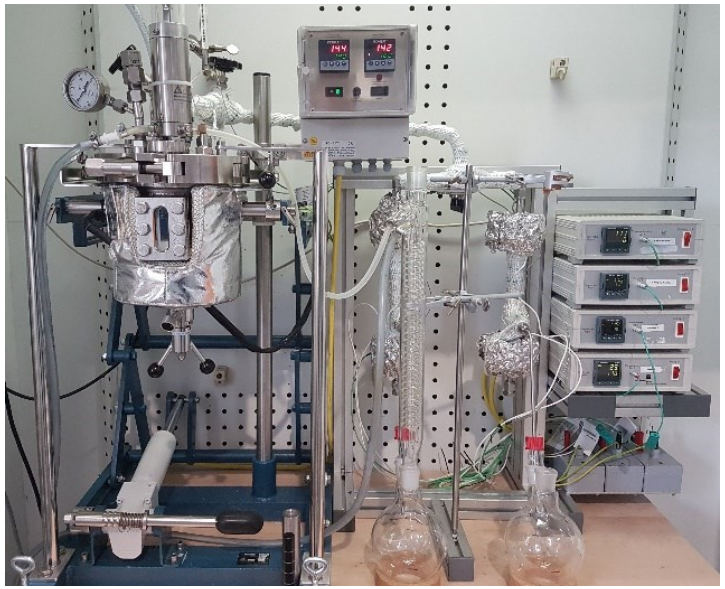
Testing scale up

From basic testing in pressurized test tubes to a 100 g/day semi-batch process

TNO

Lab-scale filtration set-up for demonstrator



Fraunhofer ICT

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Main achievements

- Proven significant progress in purity of the polymer recovered from the reference sample

❖ **Purity:**
- **Br reduction to 0.6% reached while to 0.4% is needed**
- **Sb target reached**

❖ **PLAST2bCLEANED target in the product:**
< 380 ppm Br
< 1000 ppm ATO

Reference sample

Cleaned polymer

Recovered ATO

- Process Flow Diagram for demonstrator
- Identified junctions in the process where a decision on either of two options is needed
- Challenge to separate ATO from BFR (specially the insoluble BFR)

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Economic and environmental assessment

Waste perspective: to compare the PLAST2bCLEANED recycling method to other recycling methods

"***The End-of-Life treatment of 1 tonne of WEEE plastics in a defined average composition and particle size, coming from a WEEE treatment plant***".

Product perspectives (ABS and HIPS): to compare the benefits of using recycled plastics (and flame retardant) instead of virgin materials

1 external door frame (made out of 0.495 kg ABS) of a washing machine with overall running time of 220 washing cycles per year and an expected lifespan of 10 years (7,000 running hours)".

1 inner liner (made out of 4.6 kg HIPS) of a household refrigerator's cabinet with overall running hours of 78,840 hours and an expected lifespan of 9 years"

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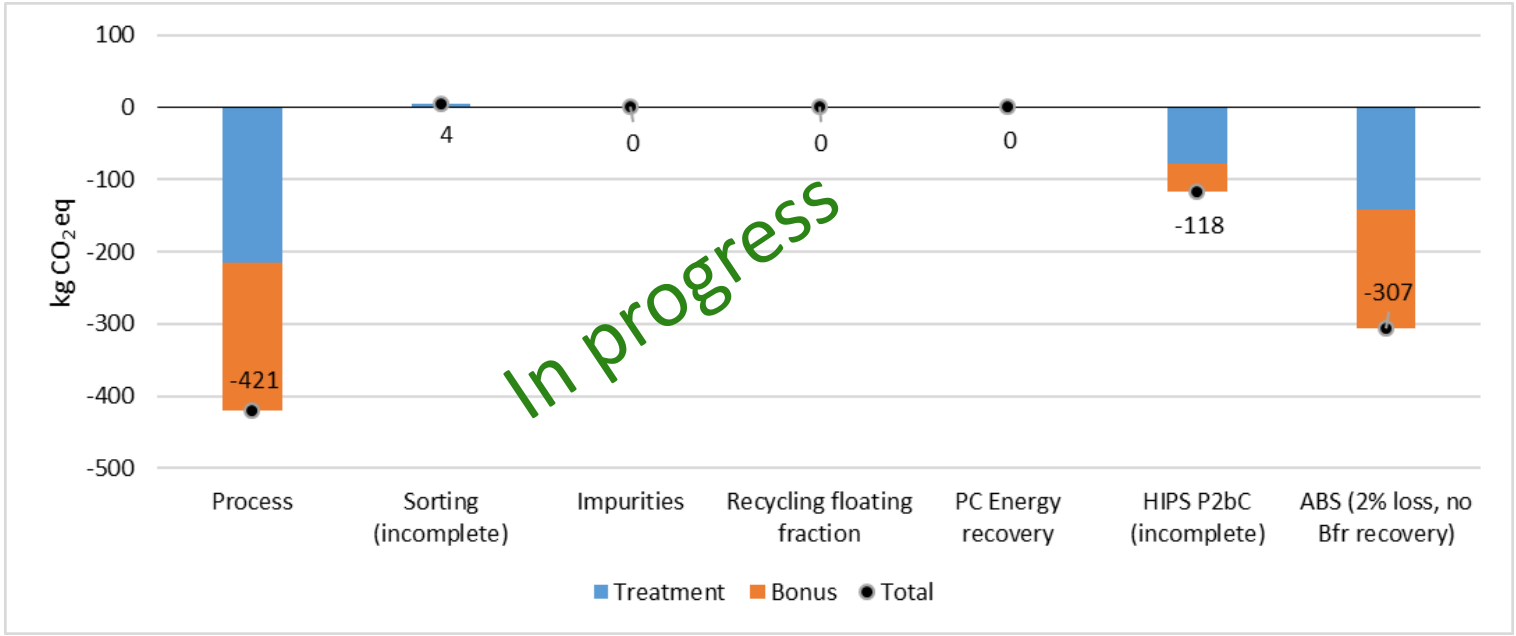
Quick scan LCA results – Draft!

INSTEAD OF MUNICIPAL WASTE INCINERATION (REFERENCE), THE BR-HIPS AND BR-ABS ARE RECYCLED THROUGH DISSOLUTION. THE DELTA CO2 IS SHOWN BELOW.

- PLAST2bCLEANED reaches a lower CO_2 impact compared to the reference.
- ABS is contributing more to the total impact savings compared to HIPS.

1 Tonne of WEEE plastic, unsorted; delta CO_2 emissions



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Summary and next steps

1. Development of a mechanical presorting technology
2. Closing 3 loops using dissolution under superheated conditions by separation of :
   - (1) the polymer
   - (2) the bromine
   - (3) the antimony trioxide
3. Process integration and scale-up
4. Performance testing of process and products
5. System optimizing for sustainability and economic viability

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Esther Zondervan – Program Manager Circular Plastics - TNO
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PLASTIC2bCLEANED

plast2bcleaned

plast2bcleaned

www.plast2bcleaned.eu

This Project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N. 821087

CREAToR - Collection of raw materials, removal of flame retardants and reuse of secondary raw materials (1.6.2019-30.11.2022)

Irma Mikonsaari, Fraunhofer Institute for Chemical Technology

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement no. 820477

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement no. 820477

Agenda

- What does CREAToR aim for?
- What has CREAToR achieved so far?
- What is CREAToR's wider impact on the circular economy?

CREATOR

COLLECT • PURIFY • REUSE

THE PROCESS

DEVELOPMENT OF INTEGRAL LOGISTIC CONCEPT

- collection of waste
- separation of polymer parts
- continuous extraction for removal of Br flame retardant
- labelling of Br free material
- modification for reuse

INNOVATION

A new, cost-effective approach

Consideration of the **whole value chain** for various **polymers ABS, PC, PA, PS**

Chracterisation and sorting of large polymer parts containing brominated flame retardants at **kg scale**

Removal of Br-FR down to **0,1 wt-%** in continuous process at kg scale

MARKET INTEGRATION

CREAToR delivers solutions to various steps of the production chain

construction & demolition	electrical & electronic equipment	aeronautics industry	automotive industry	recyclers	polymer parts manufacturers
					
waste source end-product re-use	waste source end-product re-use	waste source end-product re-use	end-product re-use	characterisation in the sorting and removal of hazardous components	labeling and re-additivation

TECHNOLOGIES

- Sorting line with LIBS technology (**Laser-Induced Breakdown Spectroscopy**) for characterisation
- Extractive extrusion with **super critical CO_2 and NADES ionic liquids** for the purification
- **Re-additivation** for the re-use (new flame retardants, processing additives)
- **Labeling** of the material to ensure hazardous flame retardant content **< 0,1 wt-%**

THE CONSORTIUM

RECYCLING

Fraunhofer ICT

EREMA PLASTIC RECYCLING SYSTEMS

Coolrec Part of Renewi

machinefabriek OTTO SCHOUTEN

VOLBAS

RELIGHT

GAIKER ik4 research alliance

CENTEXBEL

KLU KÜHNE LOGISTICS UNIVERSITY

RE-USE

MAIER

cyclefiber

DAW DEUTSCHE AMPH BOL N WERKE VON ROBERT MURJAHN

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CENTEXBEL

LCA • DISSEMINATION• LEGAL

WE MAKE TOMORROW BEAUTIFUL OVAM

ITRB CONSULTING

RWEnergia Engineering, Sustainability and Entrepreneurship

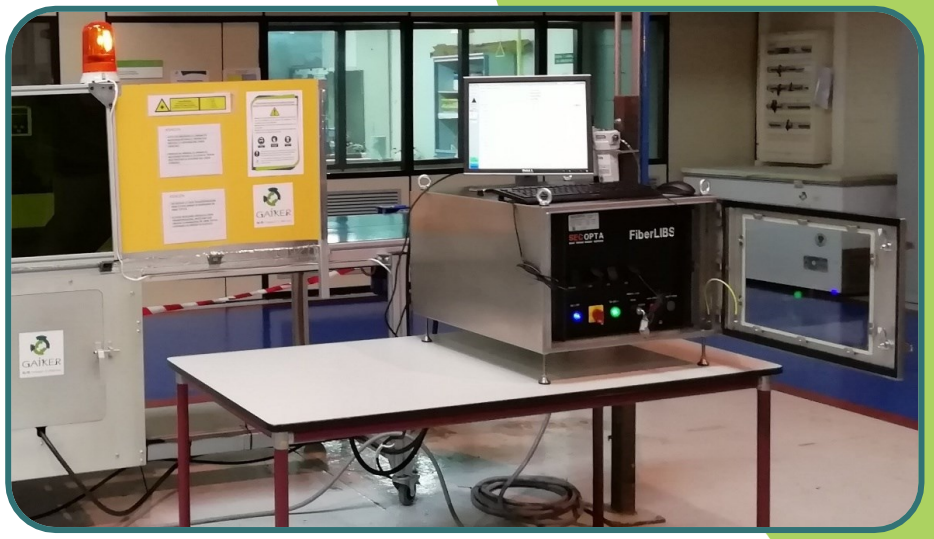
This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement no. 820477

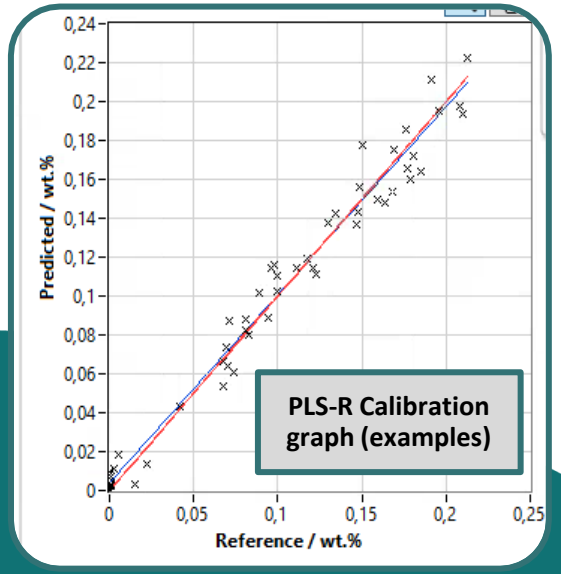
Key results

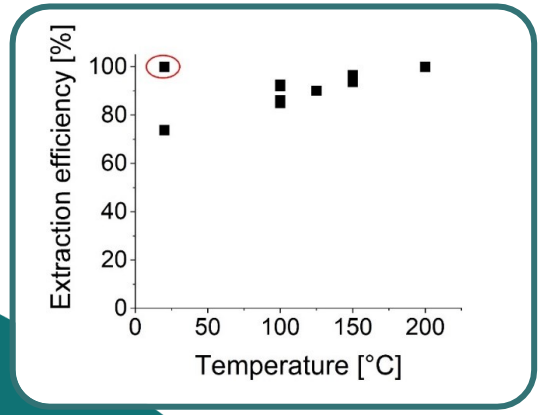
Recycling

Identification + Sorting + Purification

- Sorting at the contamination level of 1000_ppm bromine
- Batch and continuous extraction of flame retardants in extrusion, sc-CO_2 and NADES as extractive liquids







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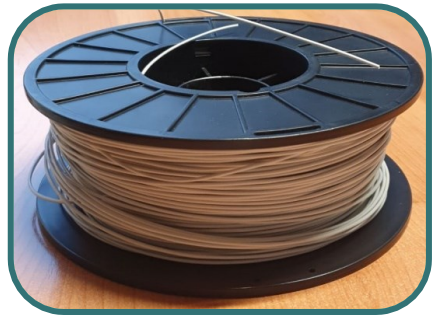
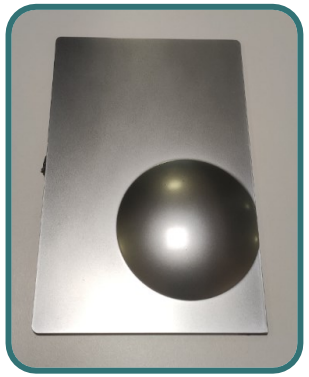
Key results

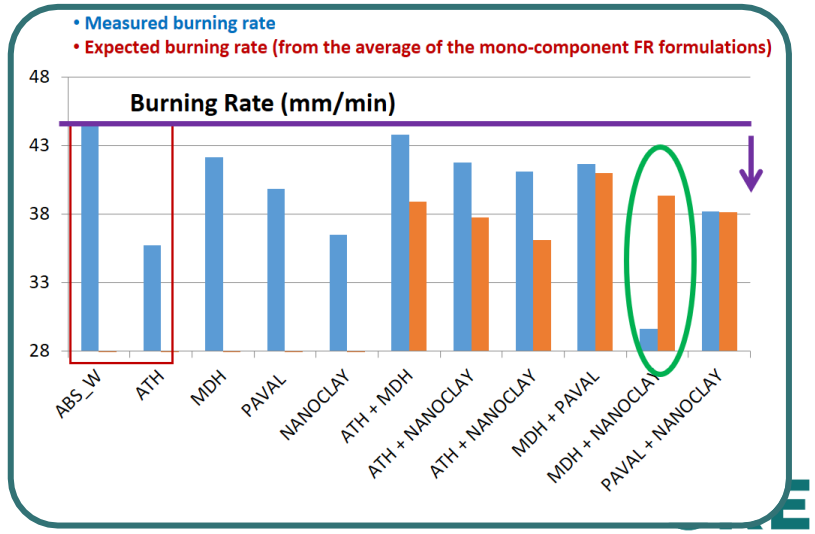
Re-use

3D printing filament + automotive interior + insulation panel

- Extrusion of 3D printing filaments from recycled materials
- Injection moulding of recycled materials
- Thermoplastic foam expansion of recycled materials
- Environmentally friendly flame retardants





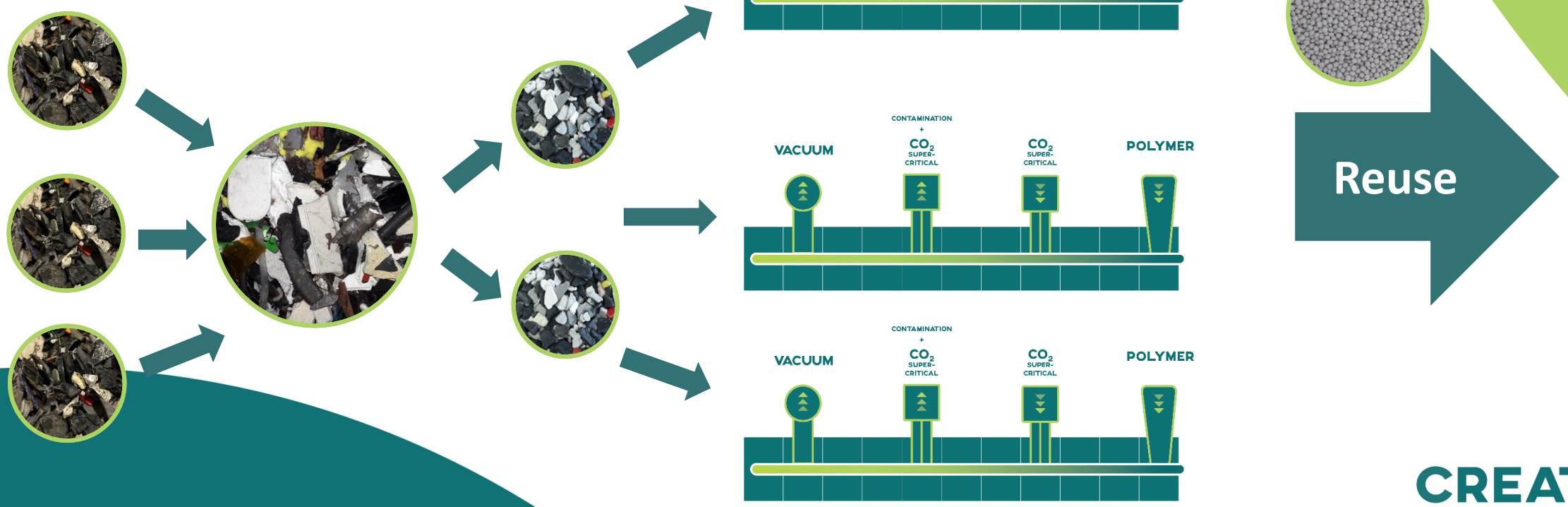


COLLECT • PURIFY • REUSE

Key results

Reverse logistics

- Requirements set up
- **Model** development ongoing



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Impacts

TECHNICAL

System for **precise separation of the plastics**

Removal of legacy addtives

Increasing the recycling rate by recovering plastics fractions that are currently sent to incineration (reduction of more than 45% of the waste plastic fraction)

SOCIAL & ECONOMIC

Ensuring new material sources lowers the dependency on **petroleum sources** within Europe

More **circular models for plastics**

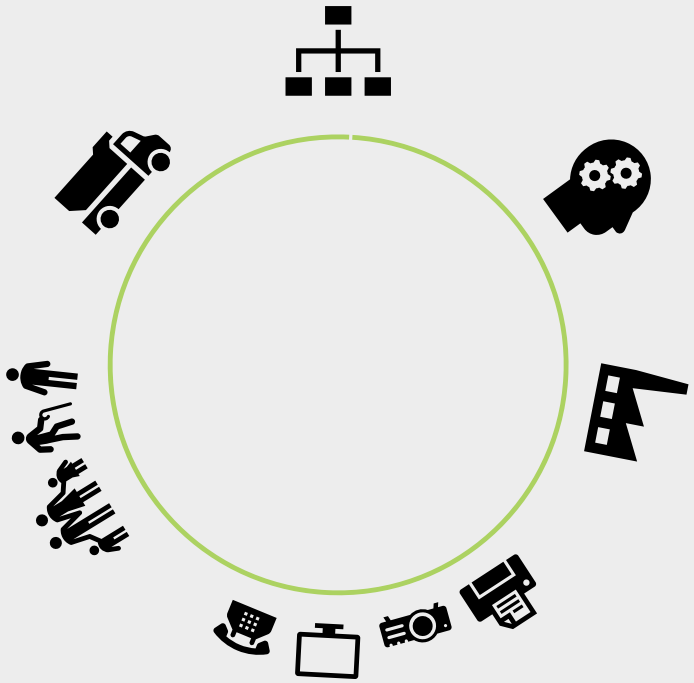
Keeping recycling technology at the highest technical level and therefore protecting European jobs in the sector

Offering treatment solutions for a **wider range of waste** within Europe

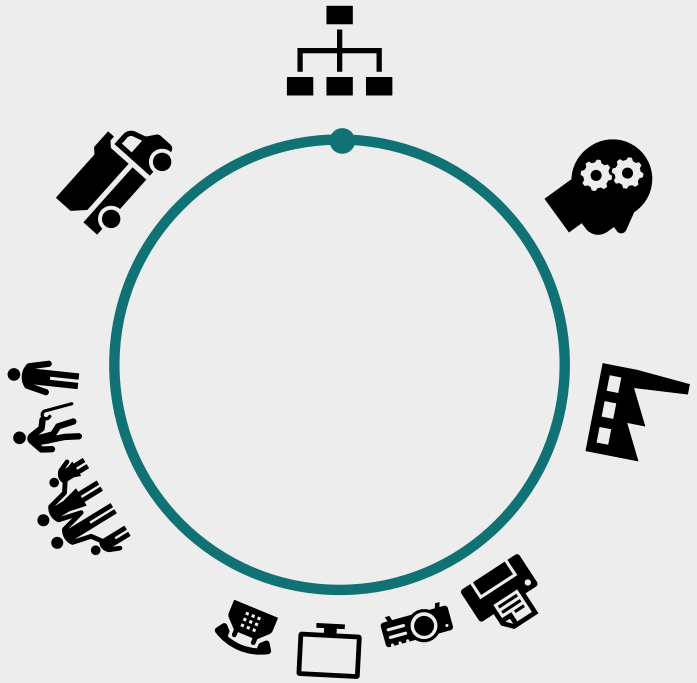
Shifting the vision of recycled plastics towards a safe secondary raw material

But this is only a tiny part of the loop

Alone you can try to be circular



You need **collaboration** to be circular



THE KEY TO SUCCESS IS COLLABORATION

Plastic recycling community

Plastic converters' community

Product designers' community

Contact

Coordinator: Irma Mikonsaari, Irma.Mikonsaari@ict.fraunhofer.de

Homepage: https://www.creatorproject.eu/

LinkedIn: https://www.linkedin.com/company/69154126/

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WEBINAR

Recycling of plastics. Towards a more sustainable plastic treatment in 2030

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@Circ_Flooring #CircularFlooring

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 821366

Circular Flooring

Circular Flooring

New Products from Waste PVC Flooring and Safe End-of-Life Treatment of Plasticizers

@Circ_Flooring #CircularFlooring

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 821366

Project Profile

- Project: Circular Flooring (New Products from Waste PVC Flooring and Safe End-of-Life Treatment of Plasticizers)
- Coordination: Fraunhofer IVV, Dr. Martin Schlummer
- Funding scheme: Horizon 2020, Grant Agreement Number 821366
- EU funding: € 5.4 million
- Duration: 4 years (06/2019-05/2023)
- Website: www.circular-flooring.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 821366

Project Objectives

The aim of the EU-funded project Circular Flooring is to enable the circular use of plasticized PVC from waste flooring by developing recycling process that eliminate legacy phthalic acid esters that are not conform with the EU REACH Directive.

Main objectives:

- Develop a process for recovering secondary legacy phthalate-free PVC from flooring waste, thus preventing usable resources from landfill or incineration
- Demonstrate circularity of PVC in flooring and applicability of phthalate free plasticizers that are compliant to REACH from waste flooring
- Assessment of environmental, health and safety impacts and techno-economic feasibility

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 821366

Circular Flooring Consortium

Circular Flooring

Fraunhofer Institute for Process Engineering and Packaging IVV

Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT Institute Branch Sulzbach-Rosenberg

Katholieke Universiteit Leuven

National Technical University of Athens

Institut National de l'Environnement et des Risques

Thinkstep AG

Lober GmbH & Co Abfallentsorgung-KG

Vinnolit GmbH & Co KG

Akdeniz Chemson GmbH

Arbeitsgemeinschaft PVC Bodenbelag Recycling

Bavarian Research Alliance GmbH

European Resilient Flooring Manufacturers Institute VZW

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 821366

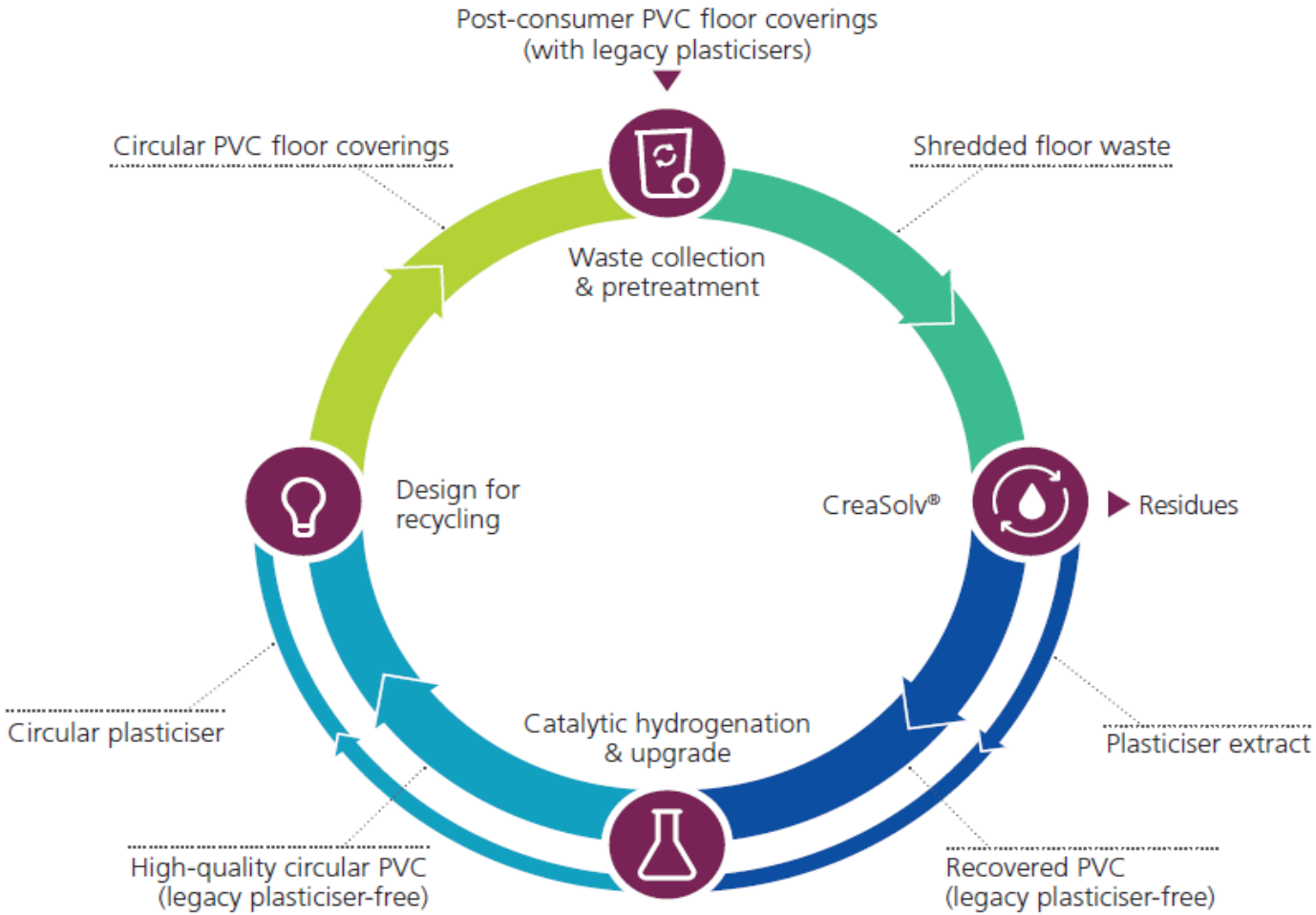
Project Objectives

Enable circular use of plasticized PVC from waste flooring by:

- developing a recycling process that eliminates legacy phthalic acid esters, which do not comply with the EU REACH Directive.
- using of extracted legacy additives for secondary phthalate-free plasticizers.
- developing a process to recover secondary phthalate-free PVC from flooring waste, thus preventing usable resources from landfill or incineration
- demonstrating applicability of rPVC in flooring and REACH compliant recycled plasticizers
- assessing of environmental, health and safety impacts and techno-economic feasibility

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 821366

The Recycling Process



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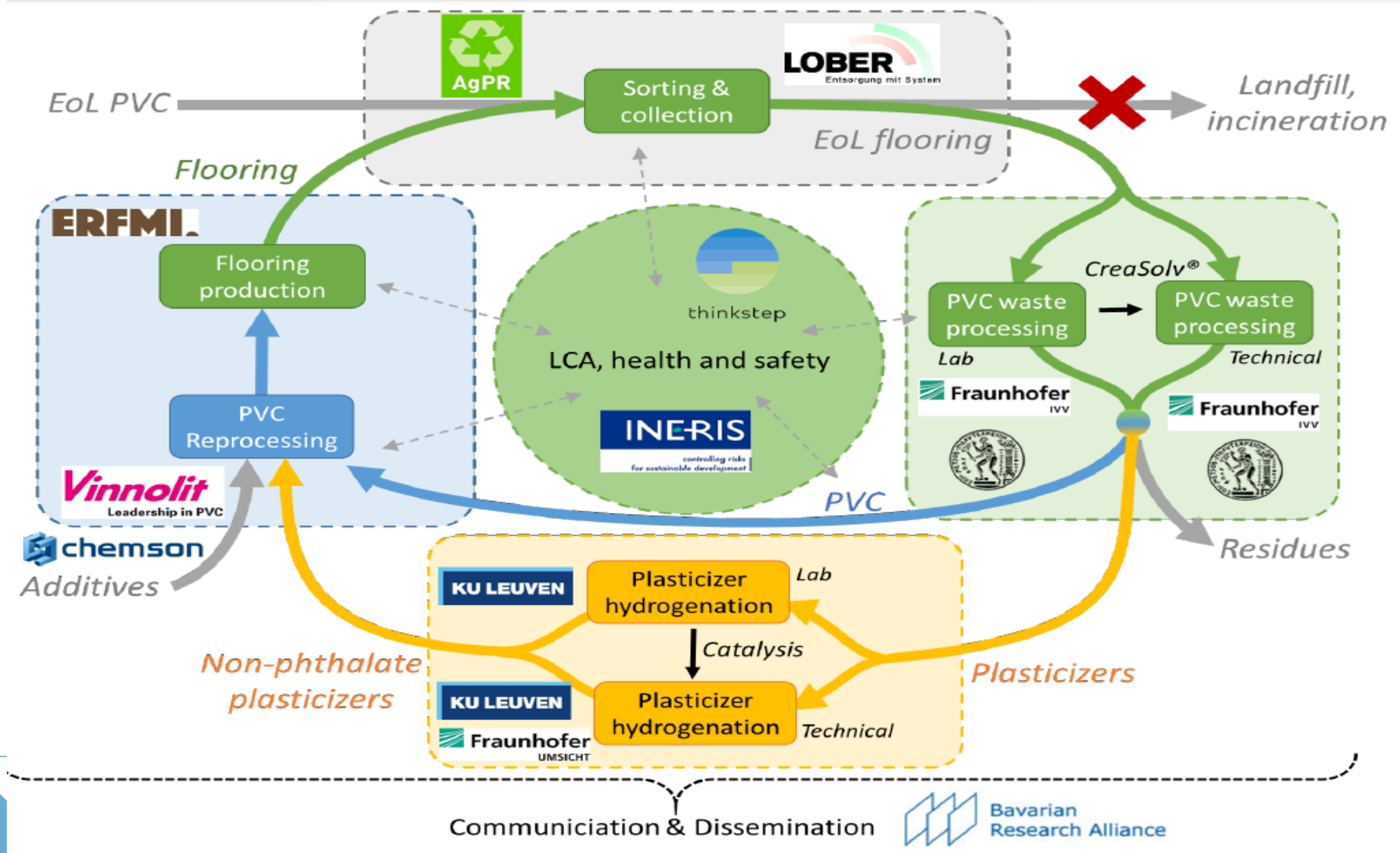
Project tasks



Key technologies

CreaSolv® Process

- Solvent-based recycling technology that enables valuable resources to be conserved in the circular economy; uses specific solvent formulations that do not contain hazardous substances as defined by EU chemicals legislation; the PVC is dissolved from the flooring formulation, precipitated and dried for reuse

Hydrogenation technology

- Catalytic hydrogenation that converts hazardous phthalate esters into safe plasticiser alternatives; recovery and valorisation of the plasticiser fraction

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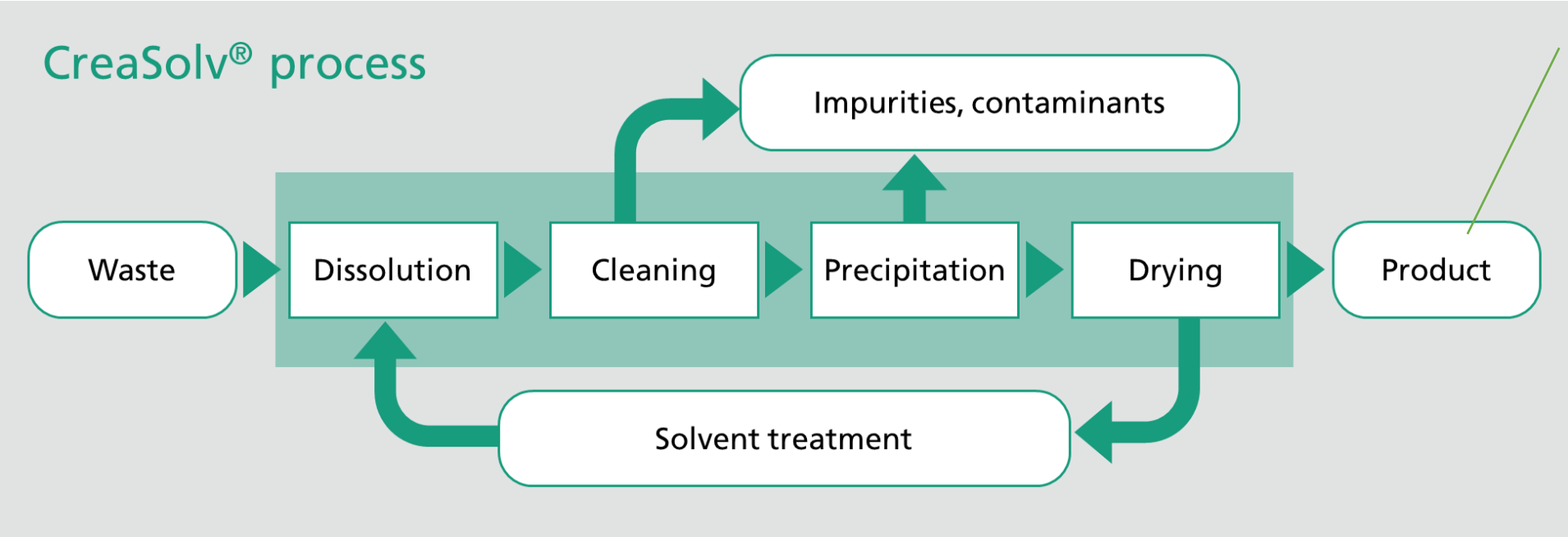
The CreaSolv® Process



- Powder
- Granules
- Paste
- Taylor-Made-Form

Re-additivation and re-stabilisation of PVC possible

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Stage of the project

Laboratory scale

Current status! (June 2021)

Pilot plant scale

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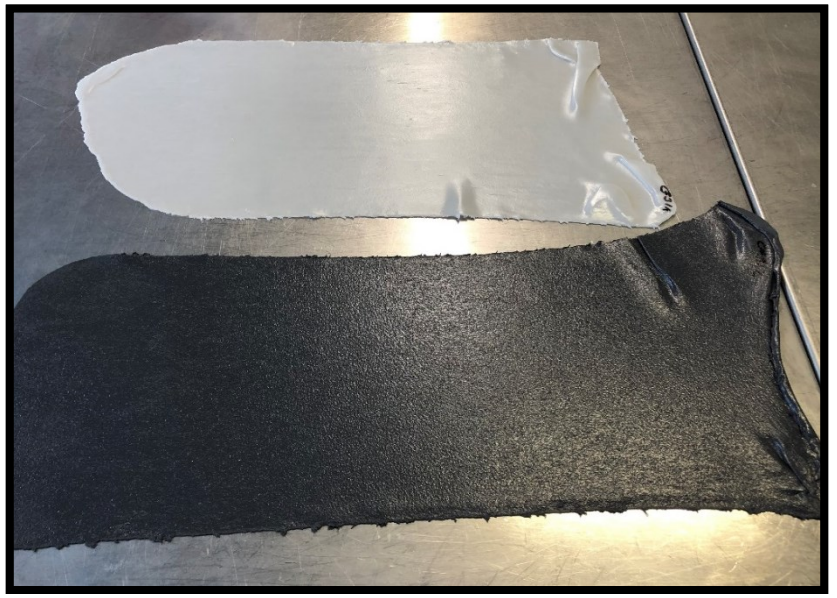
Results of the recycled PVC



Particle size
Tear strength
Elongation at break
Heat stability

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Hydrogenation technology

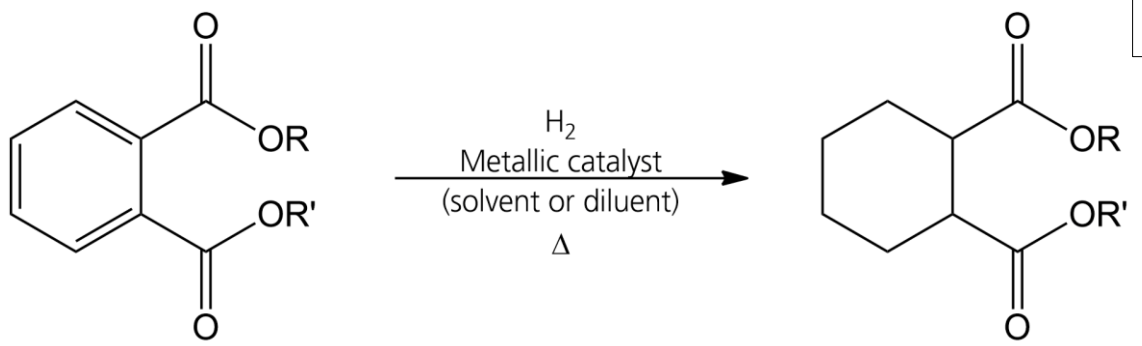
- (Low MW) Phthalates:
  - Di(iso)butyl phthalate: **D(I)BP**
  - Di-2-ethylhexyl phthalate: **DEHP**
  - Benzyl butyl phthalate: **BeBP**

→ Limited by REACH

- 1,2-cyclohexanedicarboxylates:
  - Diisononyl 1,2-cyclohexanedicarboxylate): **DINCH**

→ Little migration and toxicity level, high compatibility with PVC[3]

→ 240 000 t/Jahr (BASF, Evonik)[3,4]



(LMW) Phthalate esters

Dialkyl 1,2-cyclohexane-dicarboxylate esters

H6- Yield > 99%

[1]REACH Annex XVII
[2]plasticisers.org
[3]hexamoll-dinch.com
[4]Additives for Polymers, Volume Issue 8, pages 1,6

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Advantages of the CreaSolv® Process

- Solvent-based technology for separating substances, thus making it possible to retain valuable resources in the circular economy
- The CreaSolv® Process uses solvent formulations that do not contain hazardous substances under EU-chemicals-legislation and therefore pose no risk to users and the environment
- Helps the EU in its goal of establishing a circular economy in Europe

© Ruth Soh/ Adobe Stock

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Benefits for the European Society

- Contribution to establishing a circular economy in the EU
- Reduction in consumption of primary resources
- Removal and safe destruction of legacy plasticisers from the plastics life cycle
- Recovery of valuable resources of plastic waste
- Reduction of greenhouse gas emissions
- Creation of new business opportunities within the circular value chain

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Thank you for your attention!

For more information:

www.circular-flooring.eu


@Circ_Flooring


Circular Flooring – Pioneering Recycling Process for PVC Waste

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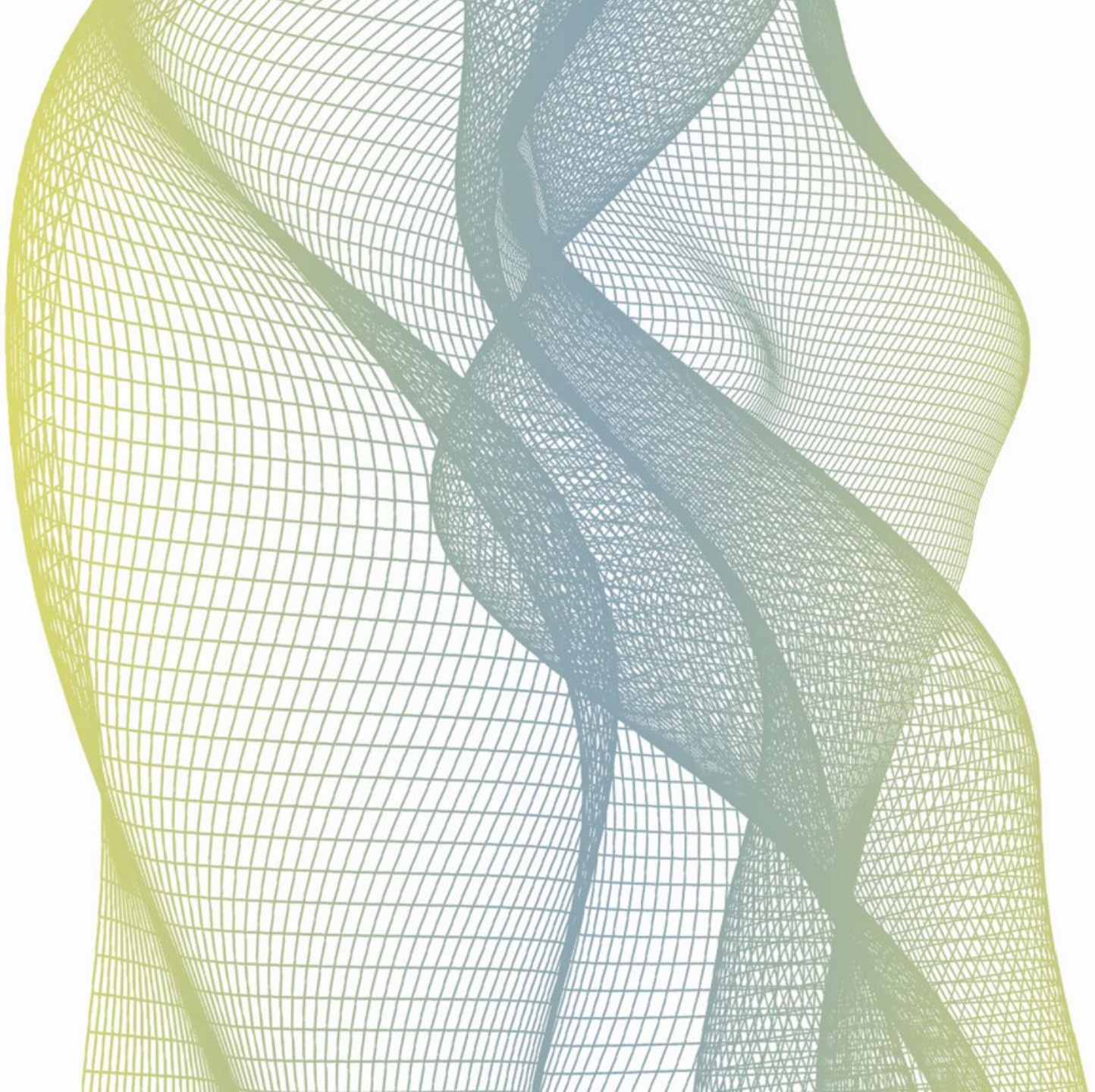


MANAGEMENT OF WASTE ACRYLIC TEXTILES COMING FROM OUTDOOR AWNINGS AND FURNISHING

Vannucci Roberto

01/07/2021

CENTROCOT: some information

1870 Test

Lab test

+500 Test

ACCREDIA

FIA

Protection

CE

Ø ZDHC

Sustainability

Certifications

OEKO-TEX®

Academy

Formations

ECODESIGNER

NEW PROJECTS

Multisectoral Research and Innovation

International technical area

Standard GB, GB/T, FZ/T, CPSIA

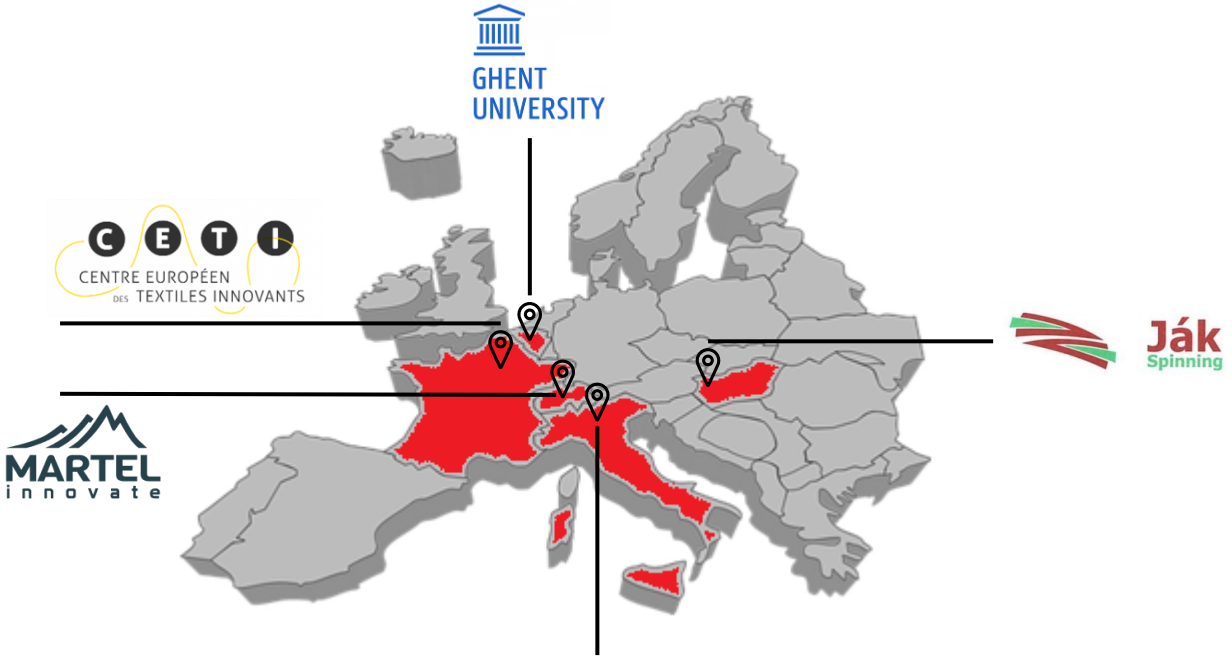
REVENUE: 8.5 M€

EMPLOYEES: +100

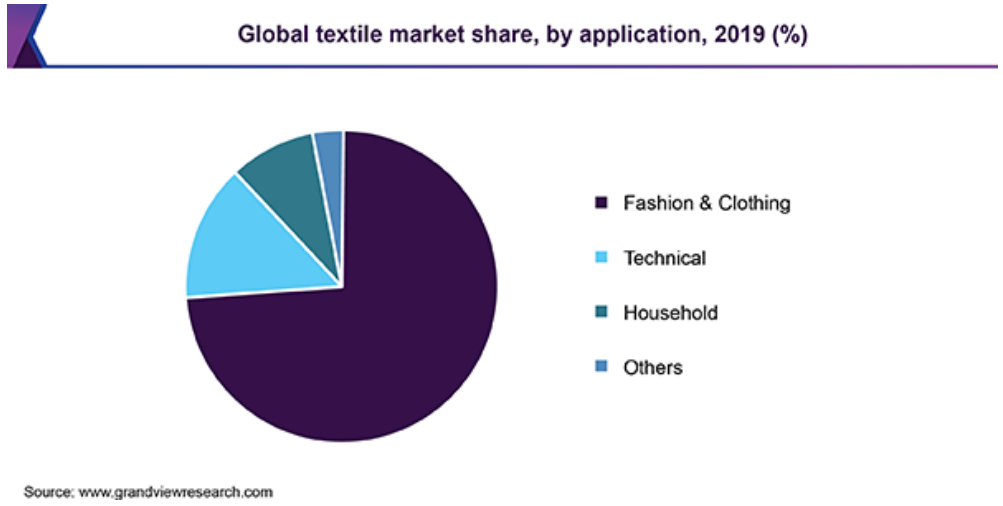
REACT – GENERAL PROJECT INFORMATION

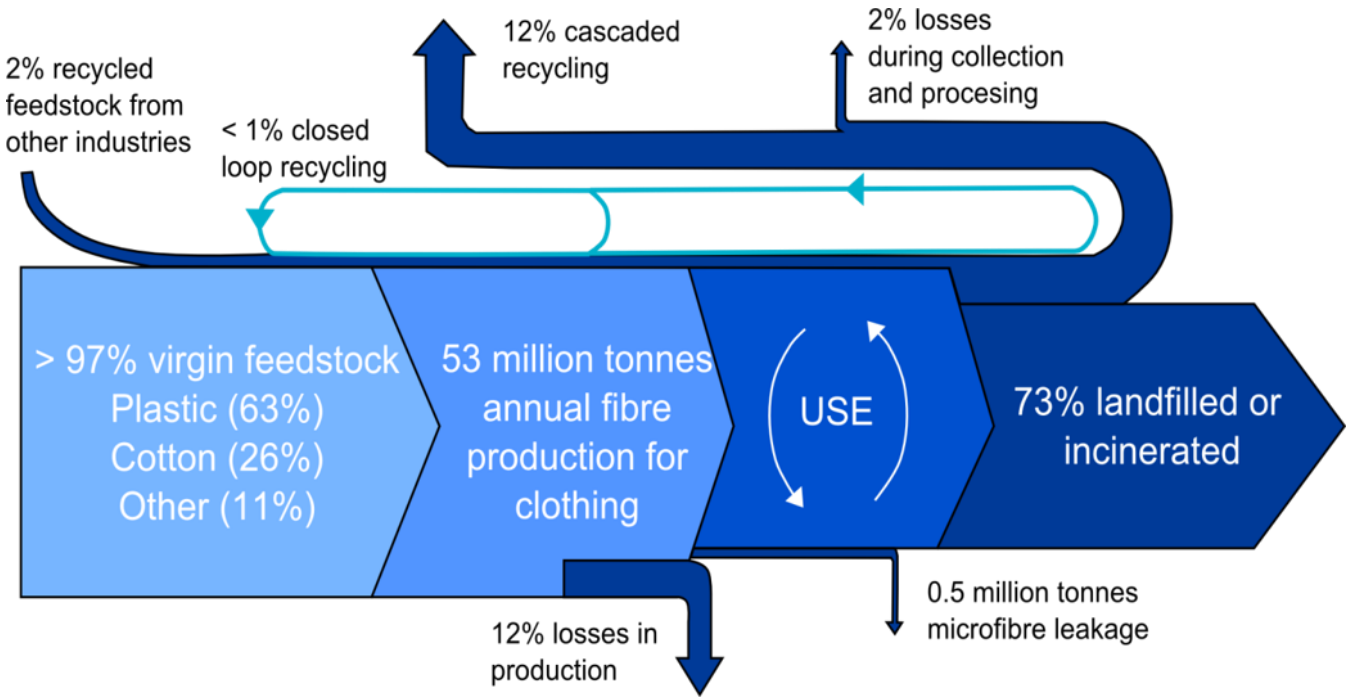
H2020-SC5-2018-2019-2020: Methods to remove hazardous substances and contaminants from secondary raw materials

- **36 months duration**
  (June 2019 – May 2022)
- **Consortium:**
  7 partners for 5 EU countries



TEXTILE SECTOR





Market value USD 961,5 billion in 2019

+ 4,3% to 2027

Textile Market Size, Share & Trends Analysis Report By Raw Material (Wool, Chemical, Silk, Cotton), By Product (Natural Fibers, Polyester, Nylon), By Application, By Region, And Segment Forecasts, 2020 – 2027, Grand View Research

Recycled Textile Market to Reach $8.0 Billion by 2026 at 5.2% CAGR, Allied Market Research

Ellen MacArthur Foundation „A new Textiles Economy: Redesigning Fashion's Future“, 2017

THE CHALLENGE

Acrylic fibre is used for clothing, outdoor furniture, boat covers and awnings, with almost 2 million tonnes produced every year.

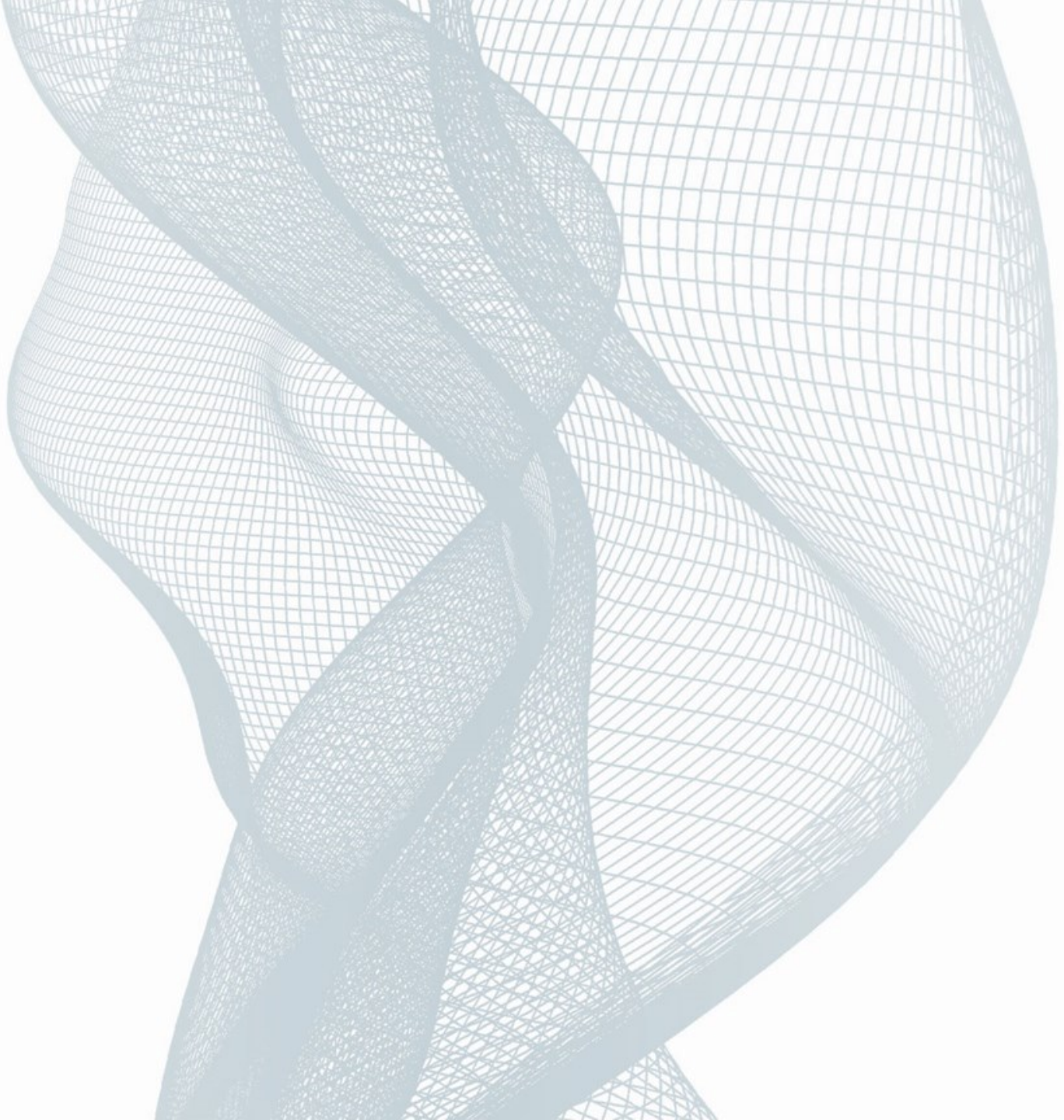
In the 'awning and outdoor furnishing' textile market, acrylic is still the main material used (more than 90% of production) **thanks to its unmatchable performance** (combination of weatherability, UV resistance and mechanical strength).

- 11'000 tonnes/year of outdoor acrylic textiles
- 2.5 million awnings installed in Europe

IT IS ESTIMATED THAT EVERY YEAR, IN EUROPE, ABOUT 7'700 TONNES OF ACRYLIC TEXTILE WASTE ARE DISPOSED OF BY LANDFILL OR INCINERATION

REACT FOR CIRCULAR ECONOMY

- **to reach a removal rate** of **90-95%** of chemicals/substances that prevent their recycling
- to treat up to **99% of all** sewage **impurities** obtained from removal steps
- to obtain a final textile product with yarn coming from **100% recycled fibre**, mixing regenerated fibres from card, winding opened thread and waste material collected fibre, each up to 33%
- to re-use the acrylic textiles as raw material for other production cycles, to reach 30 % **of waste prevented** from disposal **(3.600 tonnes total)** for the outdoor sector (awnings and furnishing)



THANK YOU FOR YOUR ATTENTION

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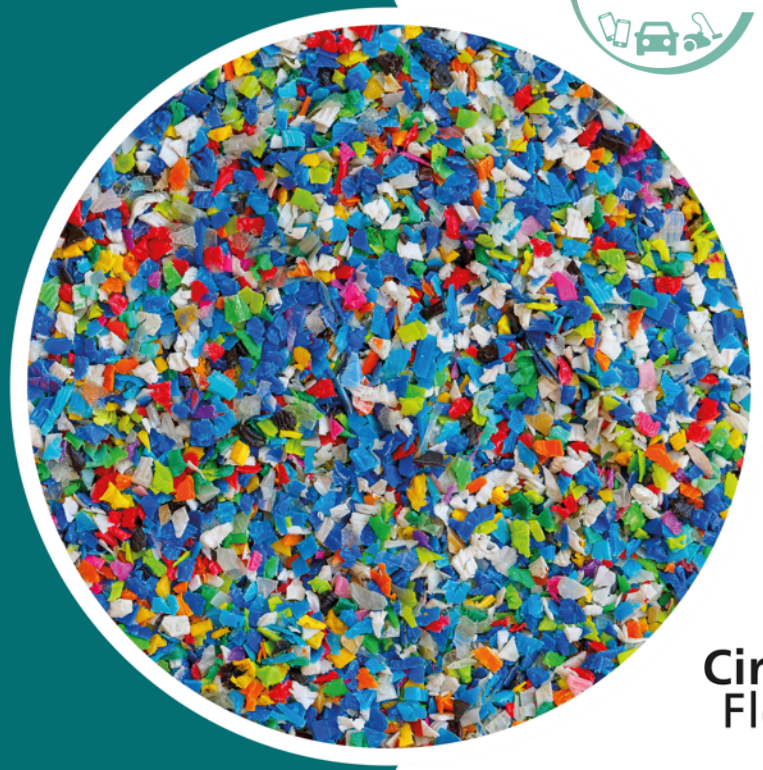
#PlasticRecycling



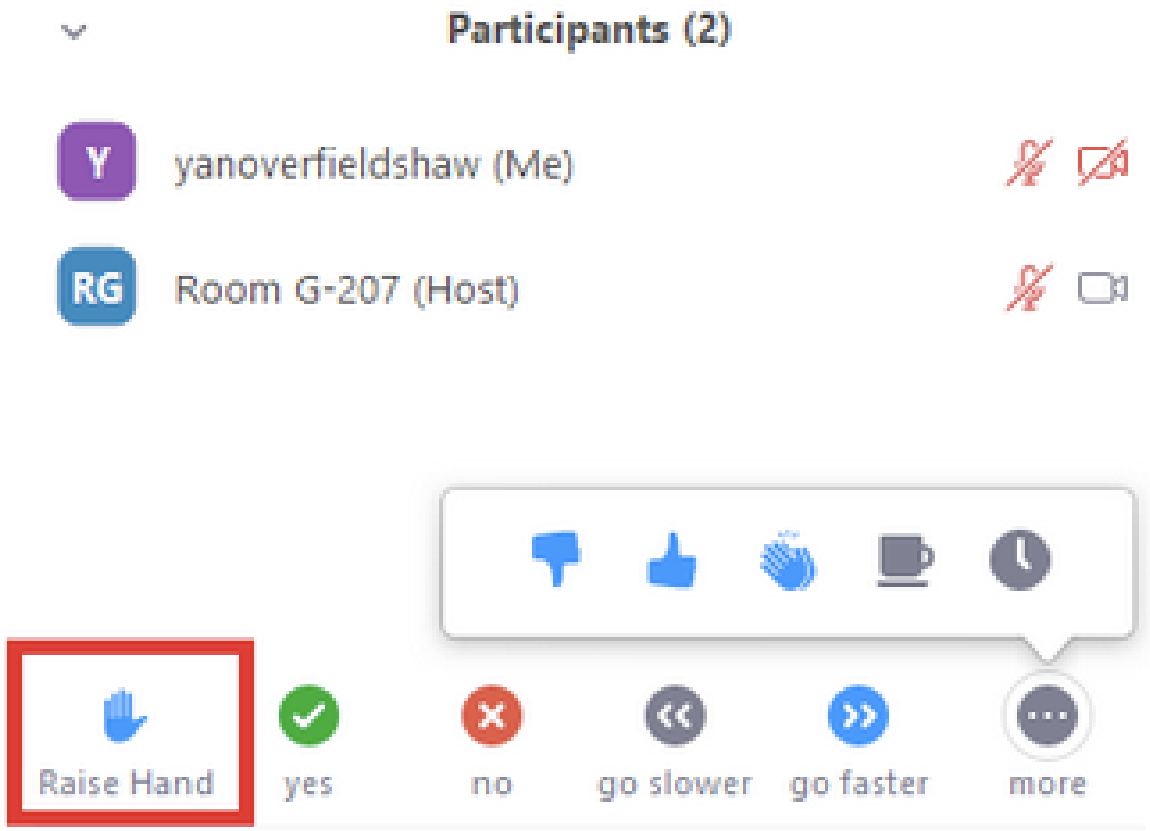
Recycling of plastics.
Towards a more sustainable plastic treatment in 2030

Session 2

Interactive discussions

How to interact

- If you would like to speak during the meeting, please use the **RAISE YOUR HAND** button of Zoom. Please also "lower your hand» once your intervention is over



HORIZON RESULTS BOOSTER

https://www.horizonresultsbooster.eu/

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>>> REQUEST SERVICES <<<

NONTOX - Increasing recycling rates of plastics waste containing hazardous substances. Developing and optimising recycling processes for safe and high-quality secondary plastic materials.
nontox-project.eu

Grant Agreement No.820895

CREAToR - Removing hazardous, already banned bromine-containing flame-retardants from waste streams using continuous purification technologies: supercritical CO2 and cost-effective solvent-based processes. **creatorproject.eu**

Grant Agreement No.820477

PLAST2bCLEANED - Developing a human and environmentally safe recycling process for Waste Electrical and Electronic Equipment (WEEE) plastics in a technically feasible and economically viable manner by closing the loop of polymer and flam retardants.
plast2bcleaned.eu

Grant Agreement No.821087

CIRCULAR FLOORING - Recovery of a PVC compound from post-consumer PVC floor coverings and the separation of legacy plasticisers with the innovative, patented CreaSolv® process in order to create a recycled material for the manufacturing of new PVC floor coverings (comment Melanie, CF).
circular-flooring.eu

Grant Agreement No.821366

REACT - Recycling of waste acrylic textiles. Ensuring the safe utilisation and disposal of removed substances.
react-project.net

Grant Agreement No.820869

The **HRB - Horizon Result Booster** is an initiative funded European Commission, Directorate General for Research and Innovation, Unit J5, Common Service for Horizon 2020 Information and Data.

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