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8.Management update

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The Circular Plastics Alliance (CPA) in brief

1. **Stakeholder initiative launched and supported by the European Commission to mobilise the plastics value chain (private and public actors) and help implement the European Strategy for plastics, in particular as regards recycled content.**
2. **Take action to reach the pre-defined target from the European Strategy for plastics (10 million tonnes of recycled plastics by 2025)**

⇨ **Complete and up-to-date info at**
https://ec.europa.eu/growth/industry/policy/circular-plastics-alliance_en

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Structure

- 293 signatories
- 5 working groups:
  - Agriculture
  - Automotive
  - **Construction**
  - Electronic Equipment
  - Packaging

Collection and Sorting
- 2021: State of play for collected and sorted waste
- 2021:identify untapped potential for collection and sorting
- 2021 Map investments needs in collection and sorting facilities and infrastructures in each country

Design for recycling
- 2020 Work plan on design guidelines and standards
- 2021 Overview of production of recycled plastics; identify untapped potential for more recycling; map investment needs in recycling facilities in each country

R& D and investment
- 2020 R&D agenda on circular plastics
- 2021 Map investments needs in collection, sorting, recycling and converting of plastics, and list the barriers

Recycled content
- 2020: Identify legal, economic and technical obstacles to more uptake of recycled plastics

Monitoring
- Set up a monitoring system covering:
  1) collected and sorted waste
  2) recycling inputs and outputs
  3) converting inputs and outputs

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Circular Plastics Alliance monitoring system

Important to provide reliable, transparent and audited figures
CPA protocol set up to monitor
- Recycling: waste input & recycled plastics output (per polymer and sector)
- Converting: recycled plastics input & recycled plastics output (per polymer and sector)

Beyond the declaration, CPA will monitor
- Pre- & post consumer split
- European and non-European origin

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Circular economy projects

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Our key focus areas

Recycling technologies

Identification/ Sorting technologies

Collections

Design for recycling (work within CEN TC 134)

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Revinylfloor research

- Project under ERFMI, co-funded by VinylPlus
- 2020 : €200,000 total expenditure €154,000
- 2021: € 225,000

  Carry over to 2021: € 46,000 for collection trials
- 2022: € 333,000

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Revinyfloor

- Recycling technologies that can be used for the recycling of PVC floor coverings
- Identification and sorting technologies that can identify flooring containing legacy additives and sort it from flooring that does not contain legacy additives.
- **Scope**: technologies that have been tried in the past, that are emerging or used for other applications
- **Work undertaken:**
  - Thorough literature and patent search
  - More than 1000 patents were found in total
  - Narrowed down to a long list of 600
  - Creation of a detailed data base including
  - List of 140 relevant companies/ technology providers
  - Interviews with providers

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Outcomes

Created a long and short list of recycling, sorting and identification technologies based on Applicability , impact, complexity, maturity etc.

Next steps: Technology trials - Feasibility testing

Extraction:

- Ultrasound Assisted Extraction
- Microwave assisted extraction
- Microwave Assisted Thermal Desorption

Sorting and Identification

- TOMRA NIR identification and sorting tool
- Steinert UniSort HSI (Hyper Spectral Imaging) / NIR
- UniSort Black identification and sorting tools / MIR

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Current status Extraction

- Sample preparation by AgPR
- Extraction trials at lab scale – started on 19th April
- 2021-10-21 presentation results: full extraction of DEHP possible

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Current status NIR sorting

NIR sorting trials at TOMRA and Steinert

Conclusions TOMRA NIR sorting tool:

- The tool does reliable sorting of “GOOD” and “BAD” samples
- Prepared (DOE) samples : 98 %
- Post-Consumer samples 87,5%
- Sometimes samples are ejected wrongly as good due to presence of a label
- Similar results with Steinert sorting tool
- Only for non-black products

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Next steps NIR sorting

Pilot trial on belt line at TOMRA and Steinert with chips smaller 30mm

- 50 kg chips post consumer clean “good”
- 50 kg chips post consumer old “bad”
- 50 kg chips post consumer mixture 50% each clean “good”/old “bad”

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Extraction using supercritical CO_2

- Feasibility trials
- Pre – prepared samples Critical Polymers to undertake trials on the feasibility of extracting legacy plasticisers using Supercritical CO2.
- ≤ 0.1% legacy plasticizer remaining after extraction, SVHC limit
- Own pilot line to be ready by November 2021
- Arnaud Verraes found a partner to built a plant for the treatment of 4.000t/a soft PVC waste in the north of France
- Plan to be operational mid 2023

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$SC\text{-}CO_2$ extractor is ordered and is currently assembled
The shipment is planned and it should be operational November 2021.

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Collection feasibility trials

- ❑ Investigate collections in the Netherlands and Germany
- ❑ Focus on post consumer flooring and off cuts from projects which are not currently collected via manufacturers' own schemes
- ❑ Work with waste management/ sorting company in each country
- ❑ Establish where to collect from and what to collect
- ❑ Test sorting technology, establish outlets
- ❑ Work with consultant to help set up on the ground

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Progress so far

- Germany:
- ❑ Contact with waste management company in Nordrhein-Westfalen
- ❑ Contact with Bert Bergfeld,
  GHF (Bundesverband GroßhandelHeim & Farbe e.V.) Via FEB
- ❑ Seeking contacts with large distributors – members of GHF

- ❑ Netherlands:
- ❑ Research underway
- ❑ Plan: Adhoc work group meeting Oct/Nov 2021

Rights and ownership of information from research & trials undertaken

- The ownership of the information needs to be clarified and formalised
- ERFMI to draft an agreement for discussion within ExCom to present to plenary
- Check with legal advisers

Circular Flooring Project- EU funded

Aim: to enable the circular use of plasticized PVC from waste flooring by developing a recycling process to eliminate legacy phthalic acid esters that are not conform with the EU REACH directive.

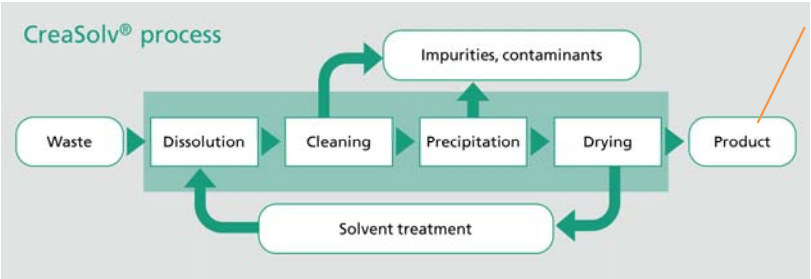
Main objectives:

Develop a process for recovering end-of-life flooring waste and producing secondary phthalate-free PVC, thus preventing usable resources from landfill and/or incineration

Demonstrate circularity of PVC in flooring and applicability of phthalate-free plasticizers that are compliant to the REACH directive from waste flooring

Determine environmental, health and safety impacts and techno-economic feasibility

The CreaSolv® Process



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

Re-additivation and re-stabilisation of PVC possible

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

Hydrogenation technology

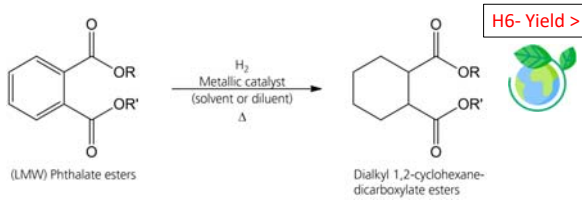
- (Low MW) Phthalates:
  - Di(iso)butyl phthalate: **D(I)BP**
  - Di-2-ethylhexyl phthalate: **DEHP**
  - Benzyl butyl phthalate: **BeBP**

  → 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]



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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Circular Flooring

Key results to date

- Valuable status quo information of PVC flooring waste was generated (production, sales, waste generation, waste collection)
- A recycling process was established at lab scale
- Phthalate level in r-PVC was brought below the legal limit
- Legacy phthalates were safely transferred in safe phthalates at lab scale
- Construction of pilot plant building and aquisition of processing machines
- Production of r-PVC flooring sheet and evaluation of r-PVC quality
- Business Model Canvas (cost elaboration)

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CiSuFlo

- Circular Sustainable Flooringcoverings.

- Project leader Centexbel
- Flooring association partner EUFCA
- Number of Partners 19
- Budget : 7,7 M€
- Duration : 48 months , starting from June 2021
- Role EUFCA and associations:
- Member of steering group
- Active role in work packages – JG project lead for collections

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- **Project Objective**

- systemic framework for circular and sustainable floor coverings Setup Integrated Product information system
- Define and evaluate circular business models and related socioeconomic impact.
- Demonstration of circular flooring via 6 pilots
- Perform sustainability assessment.
- TransfBeyond flooring and clustering
- Dissemination and exploitation

- **Pilot projects**

- Manufacturing of circular floorings
- Sorting of flooring waste
- Separation of material fractions from complex flooring waste - EuPolySep
- Laminate flooring recycling
- Vinyl flooring recycling
- Textile flooring recycling

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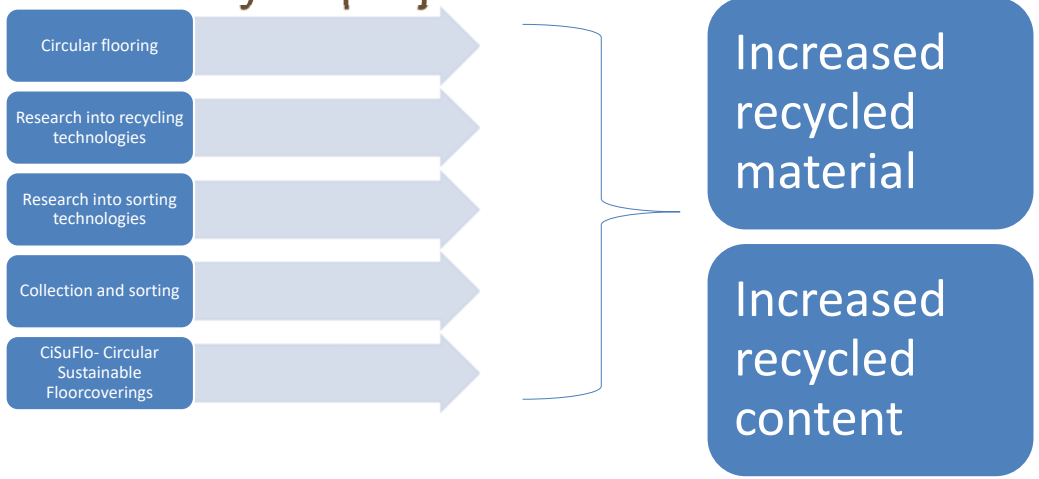
Summary of projects



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Communication

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Webinars

Topic	Date
Flooring market survey data – Interconnection consulting	30th November 2021
EU Green Taxonomy	Nov-21
CISUFLO	Sep-21
UKCA marking	Jun-21
Circular Plastics Alliance	Jun-21
Outlook and trends in the building market	Mar-21
UK REACH	Feb-21
Extended Producer Responsibility	Nov-20

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Update of website

- No text changes
- Refresh
- Better smartphone functionality
- Total cost: € 13,000

- https://dev.erfmi.com/

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Memberships

- Information, insights and influence gained by active involvement in the following groups and association

CPE	EUPC	Circular Plastics Alliance	EUFCA	Vinyl Plus	CEN/ISO
Sustainability working group, JG Chair	Raw Materials Committee	Construction working Group -J.G thematic coordinator for collection and sorting	Management Team	Advisory board	ISO TC 219 - J.G Chair
CPR working group	Building & Construction Steering Committee			Controlled Loop Committee	TC 134 WG 7 J.G Convenor
				Communcations Committee	
				Legacy Additives committee- J.G Secretary	