



# GRACE | online kick-off meeting

29/03/2024



# Agenda

10h00 Introduction

10h10 GRACE: goal and needs

*What is a COOCK+ project*

*Goal of the project*

*Importance for the sector*

10h30 First knowledge & examples

10h45 Q&A



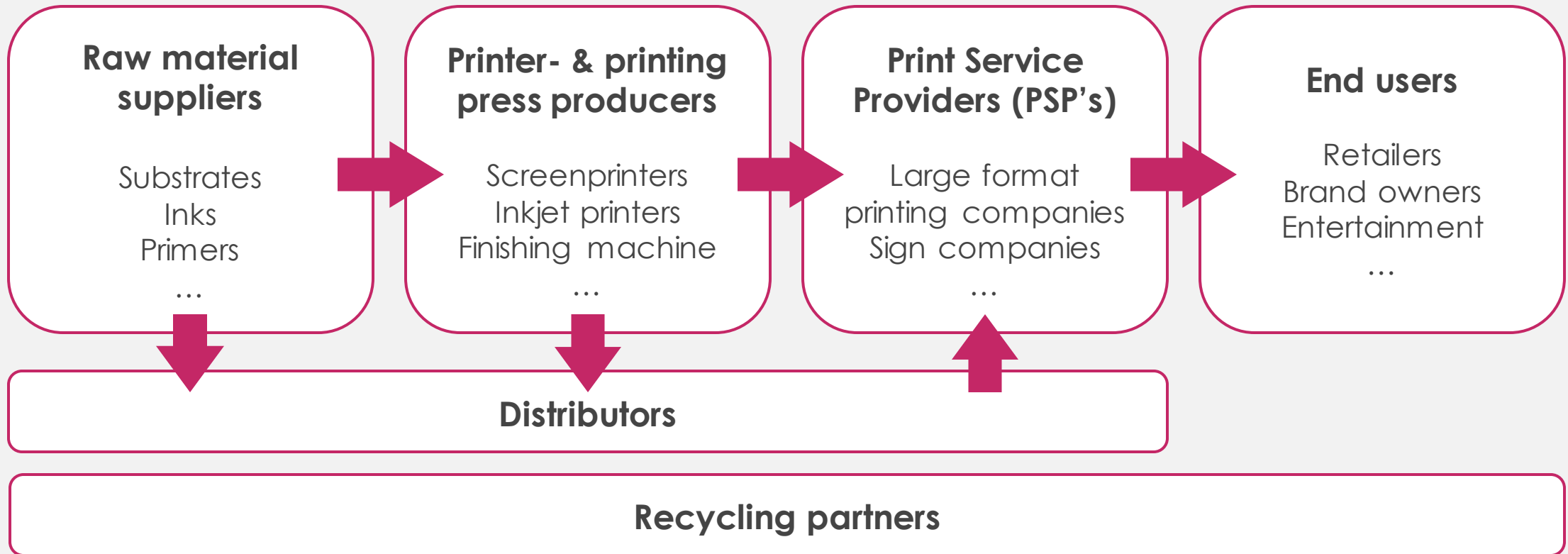
# Motive for GRACE

Interest in working more ecological but

- Difficult to collect and separate materials
- Difficult to bring different actors around the table
- Companies are trying but mainly active on their own
  - recycling options?
  - collection?
- Economic feasibility?



# Setting up a centralised value chain



# Goal of the project & what you can expect

Insights in circular concepts to aid with product decisions

- REDUCE : Use less materials
- REUSE : Reusing materials
- RECYCLE : Recycling materials

Demonstrating these concepts using:

- Physical examples
- Whitepapers
- Etc.

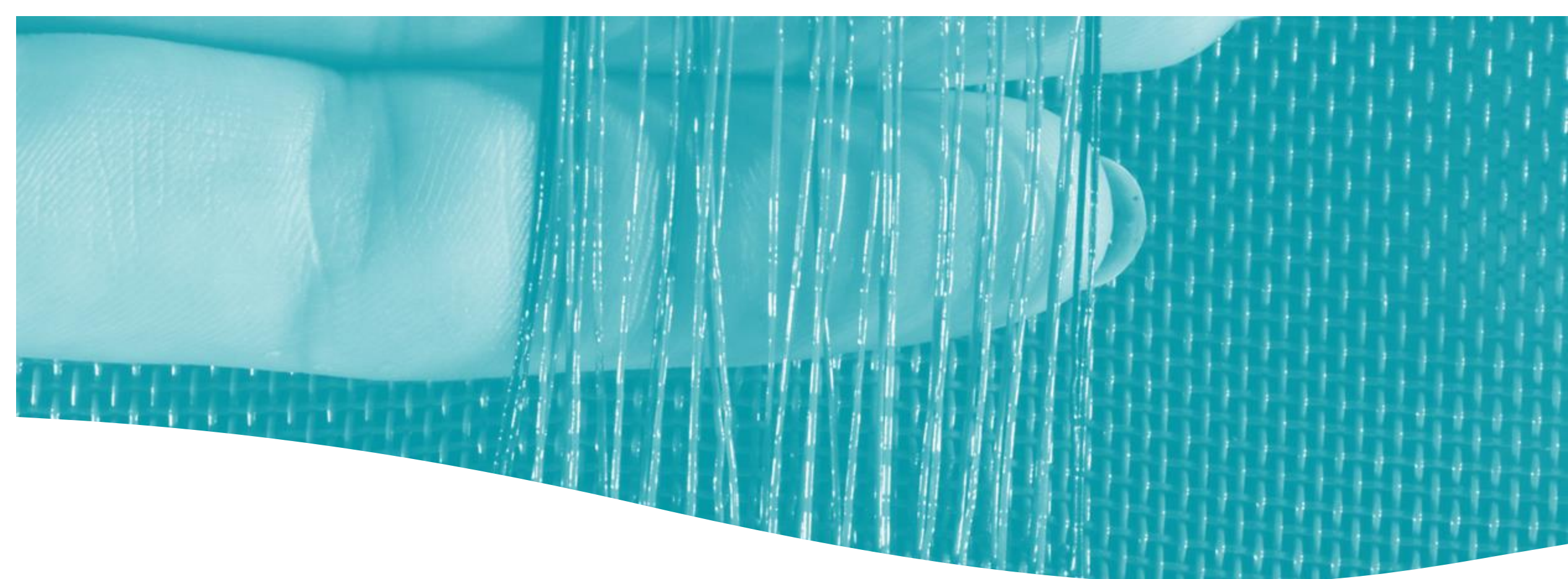


CEN  
TEX  
BEL



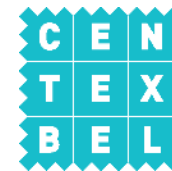
vigc



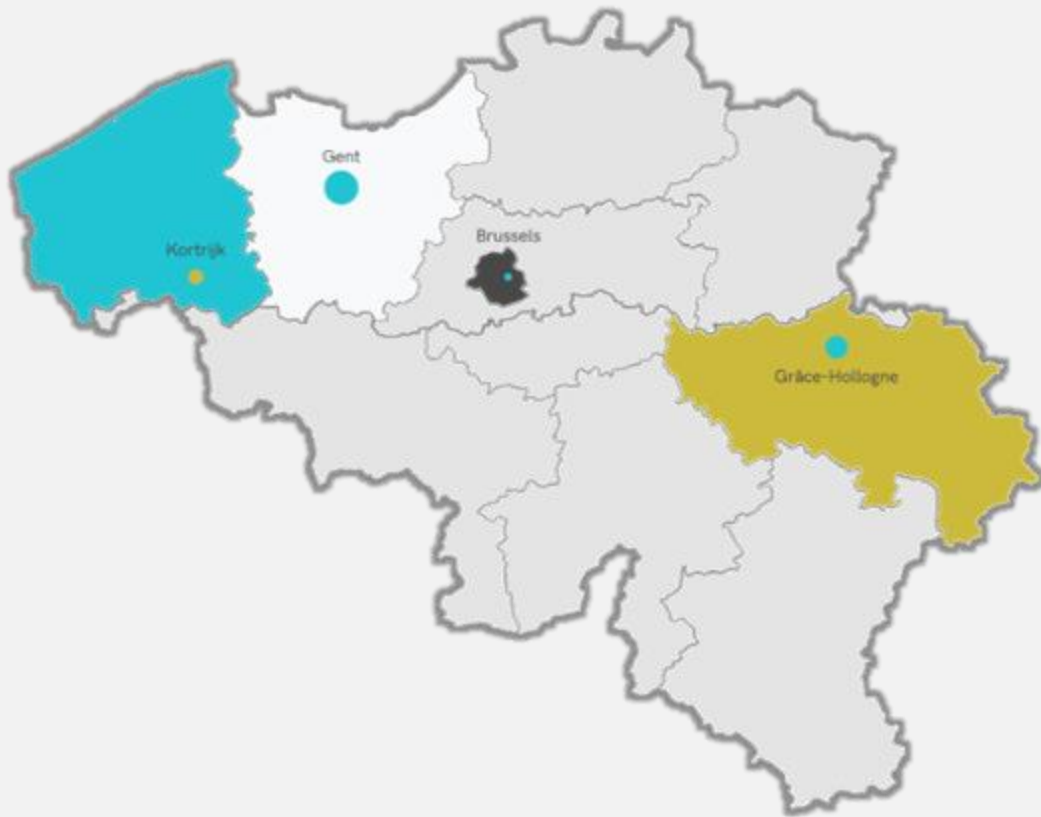


# Centexbel

Centre of expertise at the service of the textile and plastics converting industries



# Collective Research Centre



## Membership organisation

- uniting all Belgian textile producing companies and European companies from associated industrial sectors

## Governed by the industry

## In service of the industry



# Research on coating, finishing, dyeing, printing

12 colleagues

Formulations coatings & inks

R&D topics

- Biobased coatings & additives: Bio-PU, PLA, PHA, ...
- Circular economy: separation of coating from substrate
- Smart coatings & inks
- (Bio)resins & sizings for composites
- Substitution REACH non-compliant substances

Client services

- Formulations
- Application
- Testing functionalities & performance



# Research on melt processing into textiles & plastics

14 colleagues

## R&D topics

- Biobased yarns and plastics: PLA, PHA, starch, ...
- **Circular economy: sorting, shredding, compacting, compounding, reprocessing**
- Yarns as reinforcement in composites
- 3D printing from filament and pellets

## Client services

- Compounds
- Processing
- Testing functionalities & performance



# vigc

**Strategic and innovation  
partner in print!**

# *In the hart of the Benelux printing industry*

30  
partners



218  
members

+ 30%



- Commercial printers
- Label printers
- Packaging printers
- LFP printers
- Designers and design agencies

# Teamwork makes the dream work

**vigc**  
da's teamwork.



*Managing Director*

**Jos Steutelings**

+32 (0)476 760 894 — jos.steutelings@vigc.be



*Business Development Manager*

**Veerle Vanpanteghem**

+32 (0)475 964 902 — veerle.vanpanteghem@vigc.be



*Senior Innovation Consultant*

**Carl Van Rooy**

+32 (0)475 332 603 — carl.van.rooy@vigc.be



*PR & Communicatie manager*

**Liesbet Van Camp**

+32 (0)486 240 779 — liesbet.van.camp@vigc.be



*Senior Innovation Consultant*

**Fons Put**

+32 (0)495 232 134 — fons.put@vigc.be



*Office manager*

**Ils Bols**

+32 (0)14 40 39 90 / +32 (0)478 269 065 — ils.bols@vigc.be

# vigc

In 2024, VIGC celebrates its 25th anniversary  
and prepares for the 10th edition of 'Het Congres'.

We would be delighted if you could join us.

# Agenda

10h00 Introduction

10h10 **GRACE: goal and needs**

*What is a COOCK+ project*

*Goal of the project*

*Importance for the sector*

10h30 First knowledge & examples

10h45 Q&A



# What is a COOCK+ project





# COOCK+

- Collective Research & Development and Collective Dissemination of Knowledge
  - Collectief Onderzoek & Ontwikkeling en Collectieve Kennisverspreiding
- Duration: January 2024-December 2026
- Goal
  - Valorisation of previously performed research
  - Accelerated implementation of knowledge and technologies
  - Research by knowledge centers (Centexbel – VIGC)
- KPI's
  - Goal: Show VLAIO (funding) that impact is reached
  - Types
    1. Collective actions for dissemination (presentations, publications, etc.)
    2. Company specific actions: Actions that companies undertake with knowledge they gained from the project
    3. Number of companies that perform specific actions

**Important for us to know if you are using results!**

# Registration form

vigc



Willem Uytendaele  
wu@centexbel.be

## REGISTRATIEFORMULIER

Deelname in begeleidingsgroep opgericht om het COOCK+ project te steunen en aan te sturen

## GRACE

Circulaire Economie in Large Format Print & Sign sector

01/01/2024 - 31/12/2026



Ondertekende \_\_\_\_\_  
Functie \_\_\_\_\_  
Bedrijf \_\_\_\_\_  
Adres \_\_\_\_\_  
Tel / Fax \_\_\_\_\_  
E-mail \_\_\_\_\_  
BTW Nr. \_\_\_\_\_ Uw Bestelnummer \_\_\_\_\_  
Aantal werknemers \_\_\_\_\_

verklaart hierbij dat het bedrijf wenst deel te nemen aan de hierboven vermelde begeleidingsgroep

De samenvatting van het project en het doel van de begeleidingsgroep worden beschreven in bijgevoegde informatiefiche. Deelname aan het project houdt in dat (i) het bedrijf wordt uitgenodigd voor informatie- en demonstratiebijeenkomsten, voor vergaderingen van het projectconsortium en dat het wordt geïnformeerd over de resultaten van het collectieve onderzoek, (ii) het bedrijf de voortgang kan opvolgen, input en advies geven, en (iii) het bedrijf de verkregen informatie onder gunstige voorwaarden kan uitvoeren in overleg met de organiserende verenigingen.

Ondergetekende verklaart het Reglement van Orde van de Begeleidingsgroep voor collectief onderzoek te hebben bestudeerd en de voorwaarden ervan te aanvaarden.

De opvolging van het project binnen het bedrijf wordt verzekerd door (invullen indien verschillend van bovenstaande gegevens):

Naam \_\_\_\_\_  
Functie \_\_\_\_\_  
Bedrijf \_\_\_\_\_  
Adres \_\_\_\_\_  
Tel / Fax \_\_\_\_\_  
E-mail \_\_\_\_\_  
Plaats \_\_\_\_\_ Datum \_\_\_\_\_

Handtekening

# Projectactivities



# Project activities

## Projectmeetings

With guidance group

- In Dutch and at a physical location
- Sharing of information and results by Centexbel and VIGC
- Guiding priorities of the project
- Pitches by companies

For non-dutch speaking people:

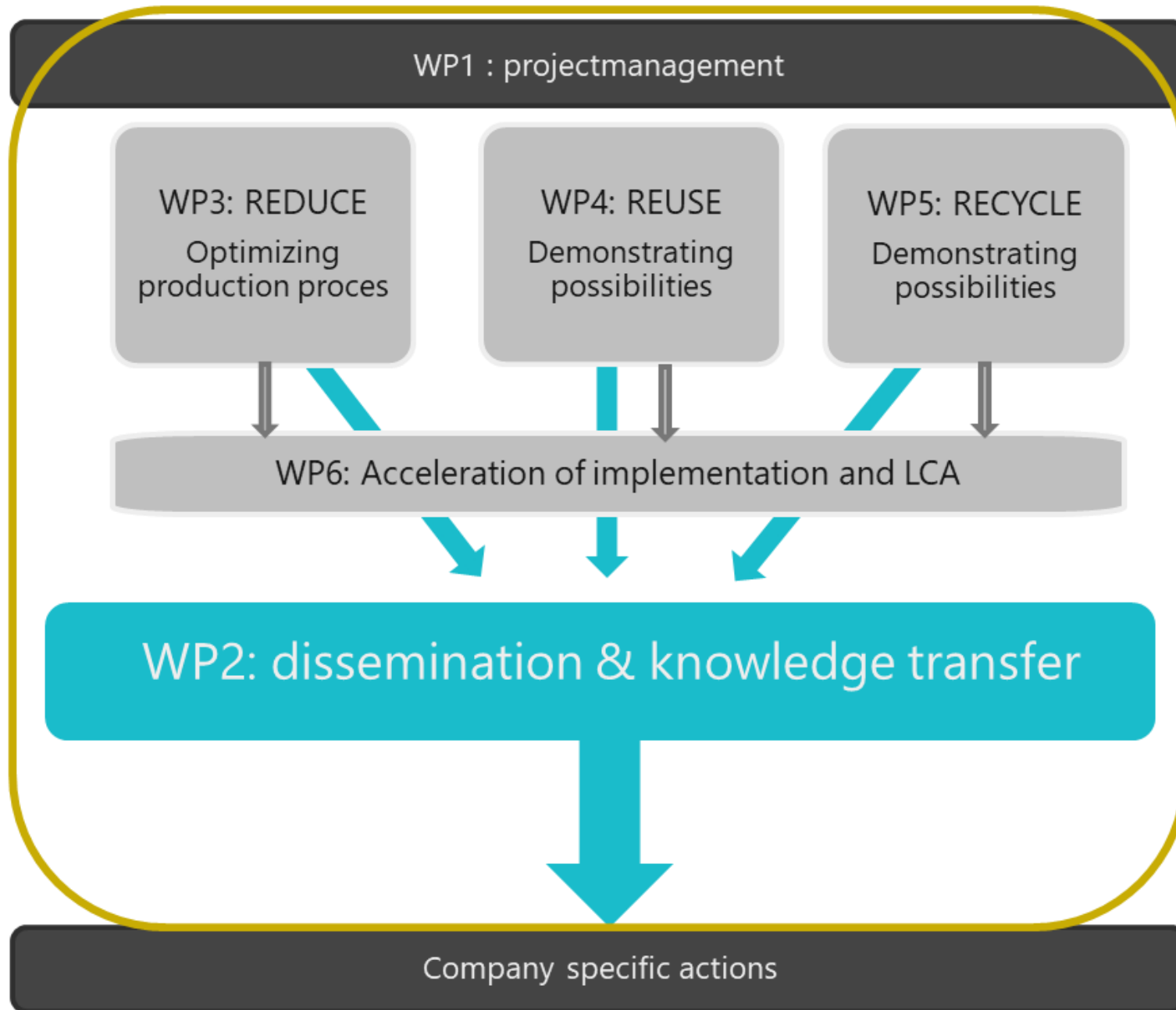
- Remote means of sharing knowledge such as newsletters, etc.

# Project activities

## Public

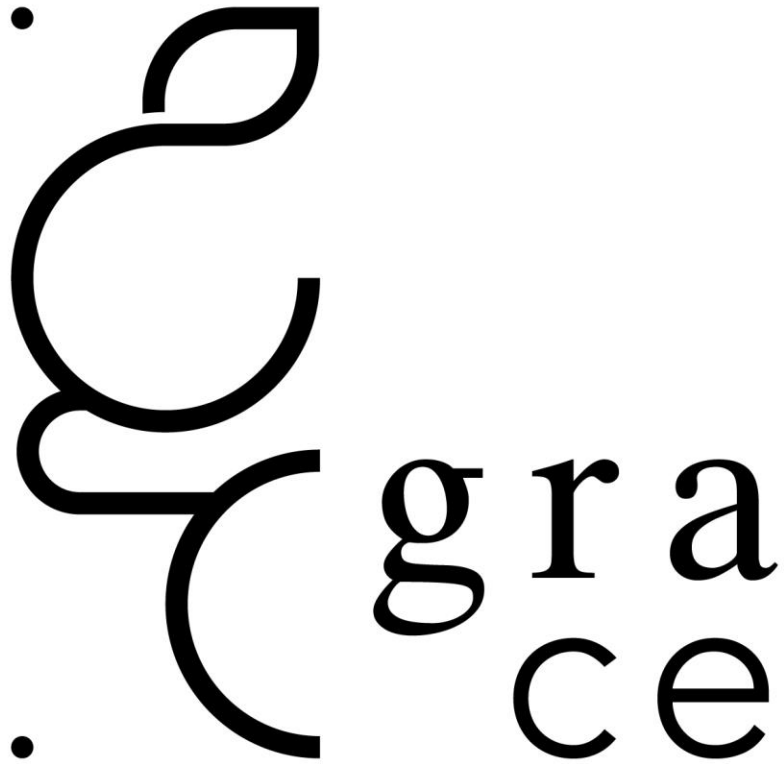
- Study visits
- Trainings
- Newsletters
- Publications

GRACE



# Dissemination en knowledge transfer

## Logo



# Dissemination en knowledge transfer

## Project website

<https://www.centexbelpresents.be/en/grace>



### Grace

---

Coated and printed substrates are a major challenge for the circular economy and thus for the printing industry. Where the mind-set used to be purely on excellent technical performance and good adhesion of ink to the substrate, today additional focus is put on a circular economy, where inks and coatings need to be removed, but also material efficiency, reuse and recycling are on the agenda.

Most Large Format Print & Sign (LFP&S) producers are still in the early stages of the transition to a circular economy.

For the first time in the creation of both organisations, Centexbel-VKC (Knowledge Centre for the Textile and Plastics Sector) and VIGC (Flemish Innovation Centre for Graphic Communication) will join forces to prepare the Large Format Print & Sign sector for a circular economy through market-ready concepts.

THE TARGET GROUP CONSISTS MAINLY OF SMES WHERE THERE IS STILL ROOM AND THE WILL TO MAKE PRODUCTS MORE CIRCULAR. IN ADDITION, THE RECYCLING SECTOR IS ALSO PART OF THE GRACE TARGET GROUP AS RECYCLING IS ONE OF THE 3 THEMES.



# Dissemination en knowledge transfer

## Downloads

Reports, guidelines, whitepaper, etc.

### Downloads

 download slides Kick-off presentation 28/2/2024

### Reports and Solutions



# REDUCE

## Optimising production processes

- Improving resource efficiency
  - Existing methods
    - Minimizing cutting waste
    - Efficient use of substrate
    - Optimisation of production planning
    - ROI calculations
1. Nesting en gangrun printing: Grouping orders to reduce cutting waste and substrate use
  2. Reduction of product size: Design smaller products with the same visual impact
  3. Using materials for multiple campaigns
  4. Inktreduction: Reducing inkt usage without losing visual quality

# REUSE

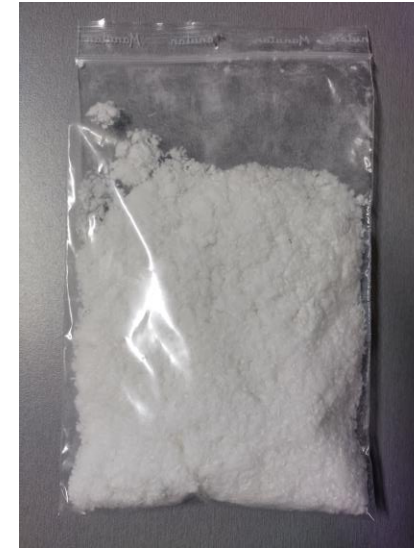
## Possibilities for reuse

Show possibilities for processes (physical or chemical) that allow reuse of complex materials

1. Chemical : Removal of ink with solvents, enzymatic treatments or other methods for discolouration.
2. Physical: Removal of top layer or application of new top layer
3. Use of a sacrificial layer

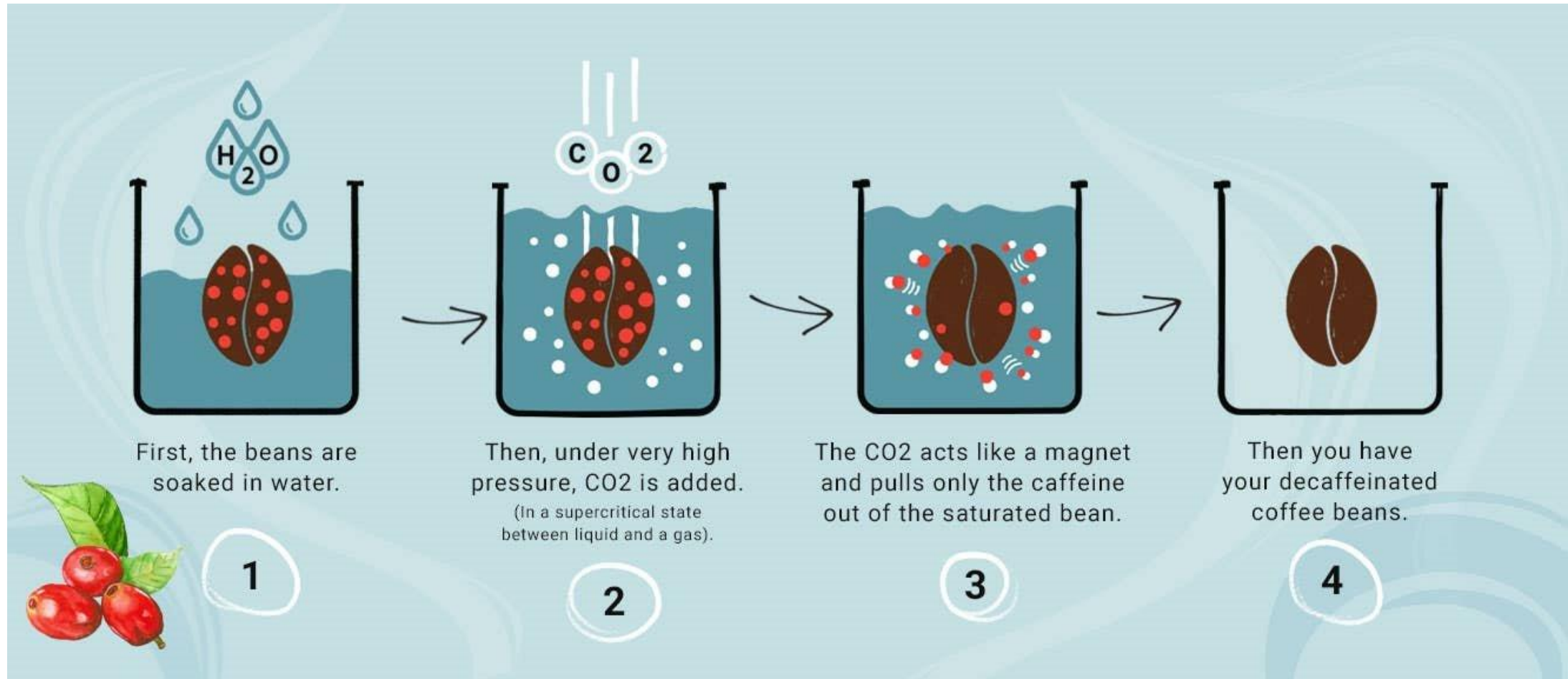
# RECYCLE

## Thermoplastic recycling



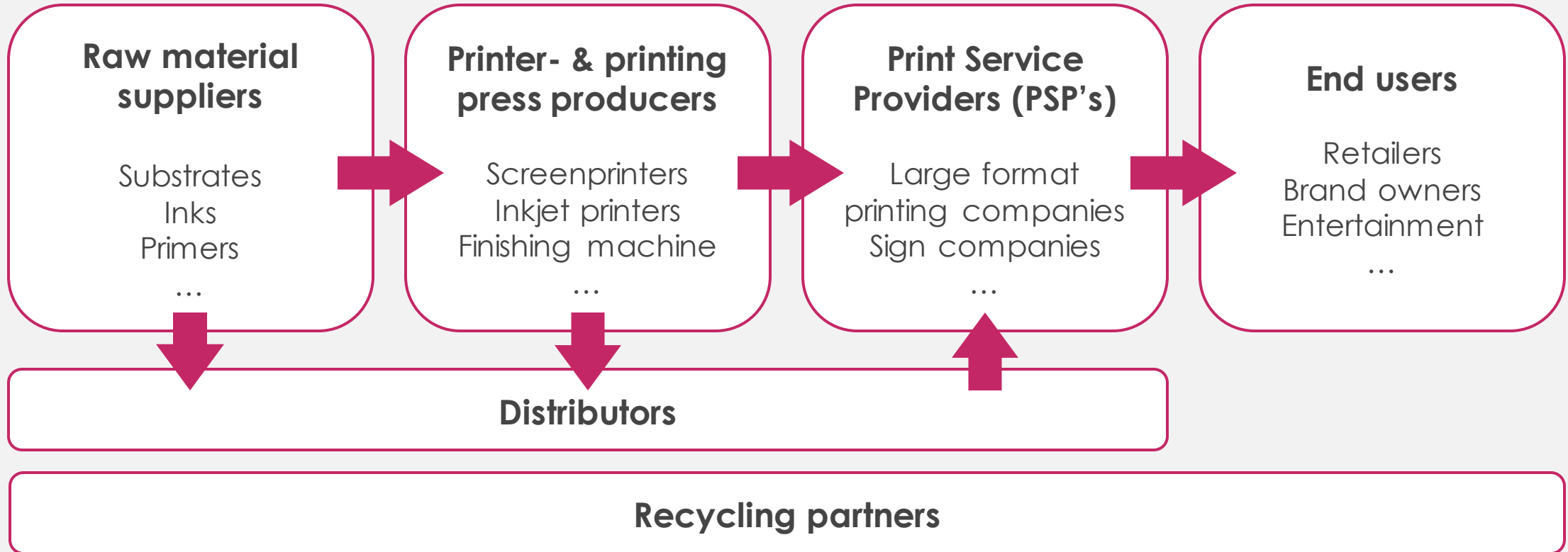
# RECYCLE

## Purification with $\text{scCO}_2$



# Implementation

## Value chain



# Implementation

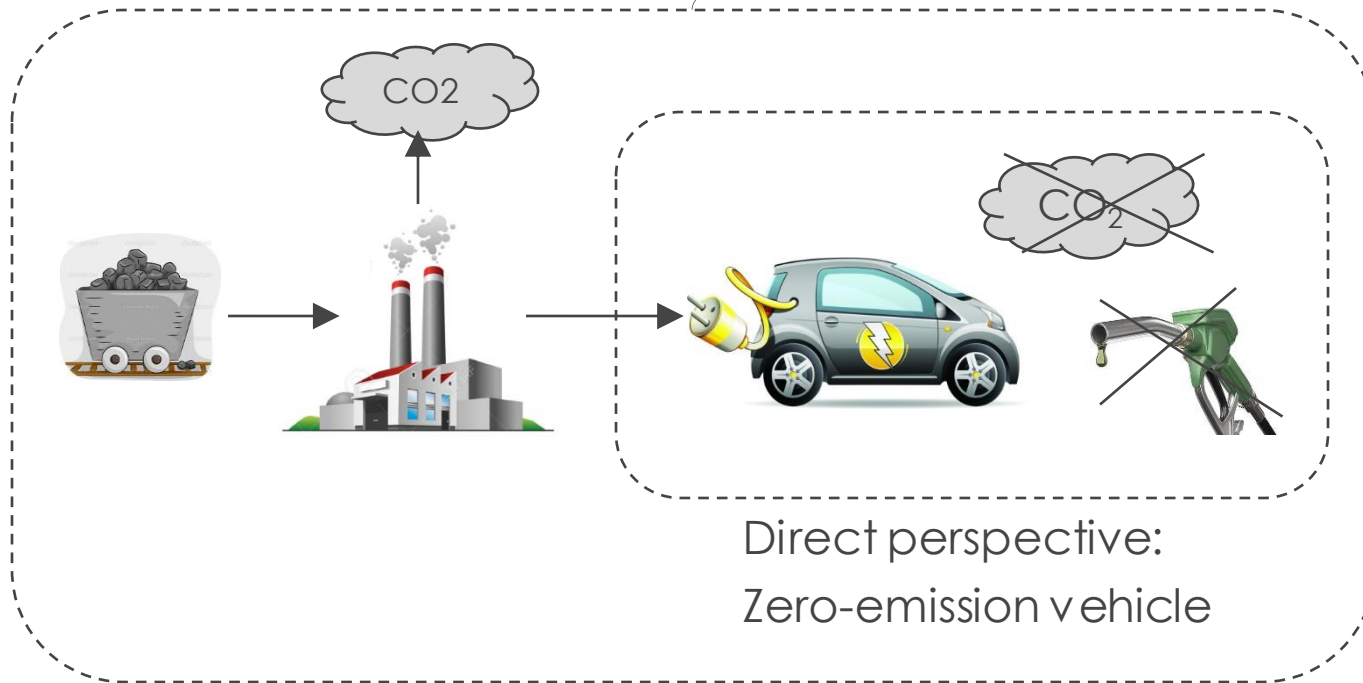
## Demo's & whitepaper



# Implementation Life Cycle Analysis



Translate emissions and resource use into environmental impact



Life cycle perspective:  
Zero-emission depends on electricity production

Global Warming	Particulate Matter
Ozone Depletion (hole in ozone layer)	Human Toxicity (non)cancer
Acidification (acid rain)	Ionizing Radiation
Ozone Formation (smog)	Water consumption
Water Eutrophication (over-fertilization)	Land occupation
Aquatic & Terrestrial Ecotoxicity	Fossil & Mineral Depletion

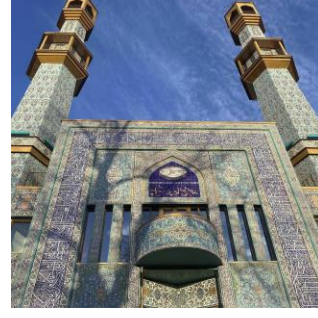


# Circular Printing in Large Format

The importance of a sustainable approach



# Large Format Print & Sign Products & markets



# Large Format Print & Sign Substrates

## Plaat

Dibond® 1 dag  
Easyprint 10mm  
Sign Again **Nieuw**  
AkyLite® (Plex) **Nieuw**  
Multiplex 9 mm  
Polystyreen opaal  
Plexiglas  
Forex® 1 dag  
Polyprop (Kanaalplaat) 1 dag  
Trespa en HPL  
Dibond Butler Finish  
Blanco Plexiglas  
Dibond XL  
Re-board  
Polystyreen  
Displaykarton  
Evacast  
Blanco Plaat 1 dag  
Honingraatkarton

## Doek

Dekostof 1 dag  
Flag  
Flag Longlife 1 dag  
Flag PET  
Blackback  
Samba Backlit  
Decotex UV  
Structex  
Canvas  
Blanco Doek 1 dag  
Backlitdoek

## Wandbekleding

MultiTexPro® **Upgrade**  
ProVinyl textiel  
ProVinyl leer  
Erfurt Variovlies  
ProVlies mat  
Airtex® 1 dag  
WalltexPro®  
Basicwall  
SanoTex

## Textiel

Mezo  
Kendal  
Katoen  
Velvetly  
Velours  
Sava FR  
Sorento FR

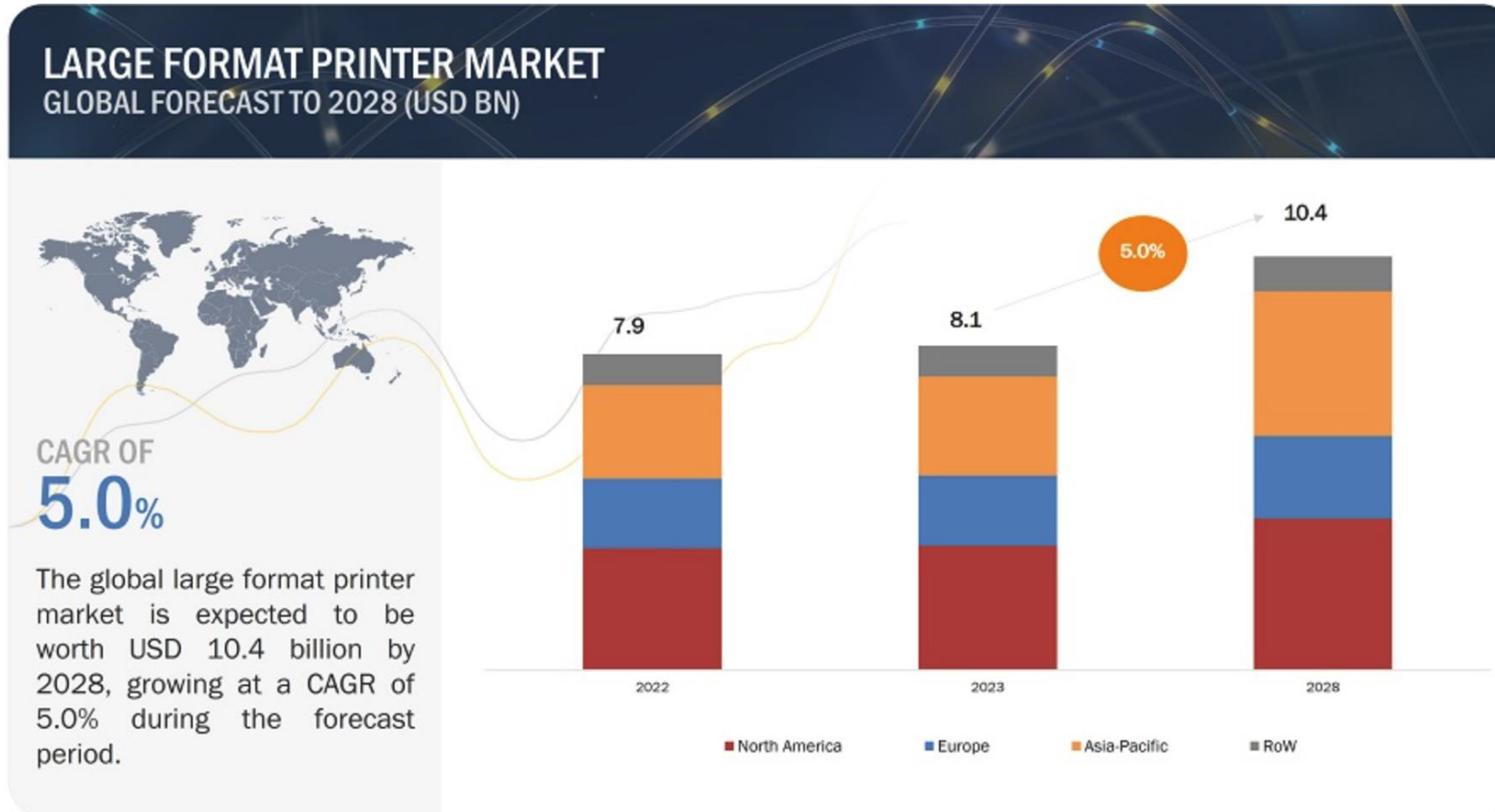
## Banner

Budget Banner  
Banner 510 1 dag  
PVC-vrije banner  
Meshdoek 1 dag  
Banner 610  
ProPES Outdoor  
ProPES FR  
Zwart-wit banner  
Polymesh  
Roll up materiaal  
Soundmesh

## Folie

QuaPro permanent pvc-vrij  
Magneetfolie 0,5 mm  
QuaPro promotioneel  
QuaPro permanent 1 dag  
Orajet® 3651 - transparant  
Orajet® 3651RA - wit 1 dag  
Orajet® 3162 - transparant  
Orajet® 3162 - wit 1 dag  
Magneetfolie 0,85 mm  
Roughmark  
3M IJ40-10C - wit - comply lijm  
3M™ IJ40 - transparant  
3M™ IJ20 - wit  
3M™ Print Wrap Film IJ280 - wit  
Statisch hechtende folie - trans  
Statisch hechtende folie - wit  
Avery MPI 1105 EA  
Avery MPI 2000  
DOT folie  
One Way Vision Folie  
[Bekijk alles \(32\)](#)

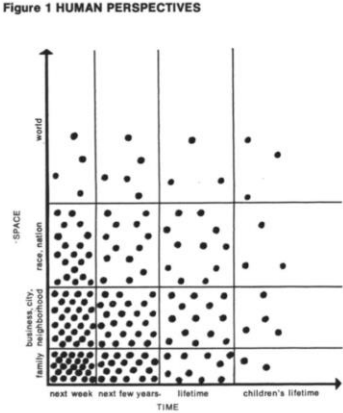
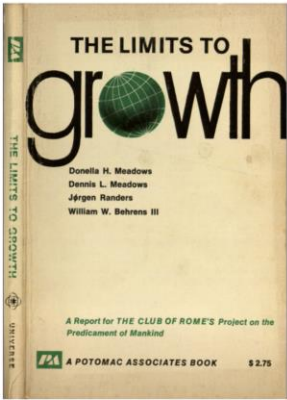
# Large Format Print & Sign Market value & growth



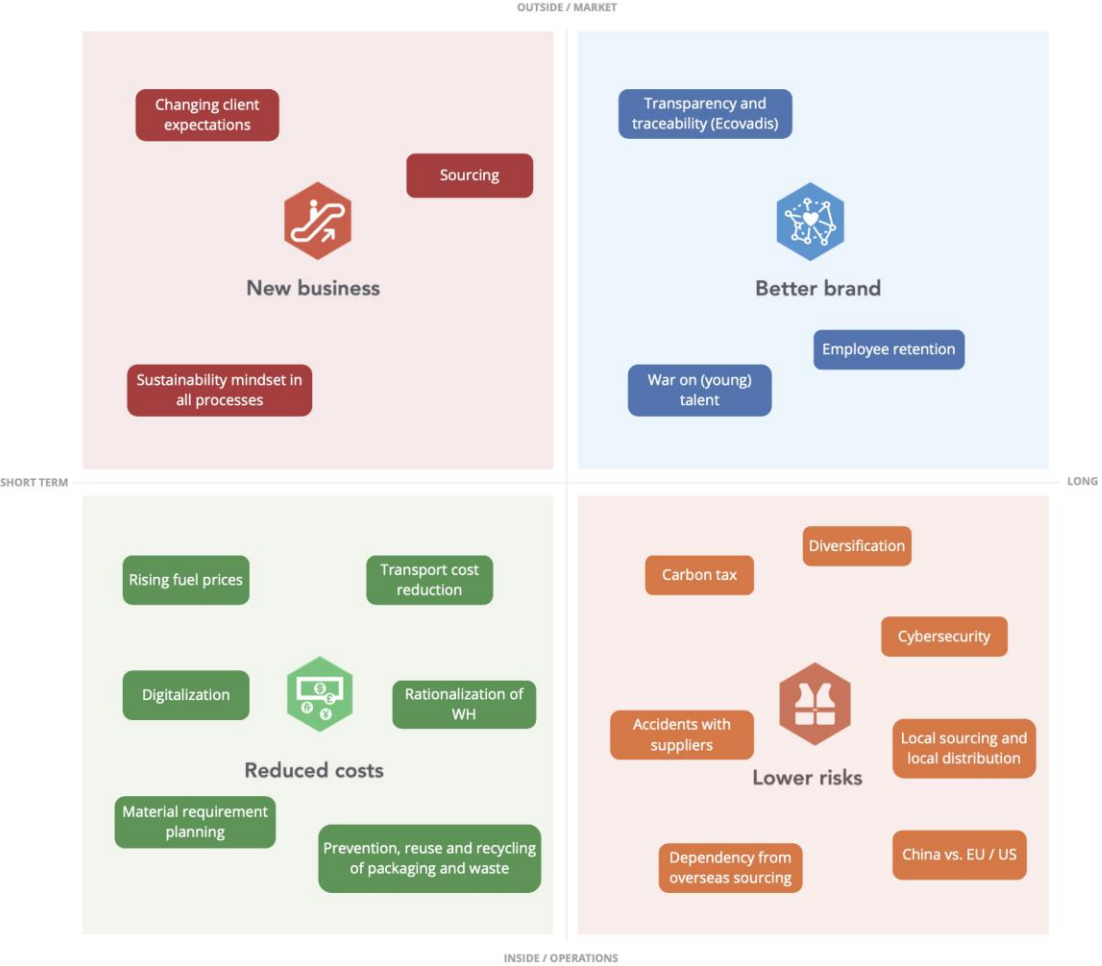
Bron: <https://www.marketsandmarkets.com/Market-Reports/large-format-inkjet-printers-lfp-market-523.html>

# Large Format Print & Sign

## Growth and Sustainability are bonded



1972 – Club of Rome



2024 – business case for sustainability

# Large Format Print & Sign

## Circular economy

Basic principles:

- Keep value
- Avoid waste (value loss)
- Minimise environmental impact (impact from beginning to end)



**Extraction**

↑ Energy  
↓ Carbon footprint



**Production**

↑ Energy  
↓ Carbon footprint



**Printing**

↑ Energy  
↓ Carbon footprint



**End-of-life**

↑ Energy  
↓ Carbon footprint

# Large Format Print & Sign

## Circular economy

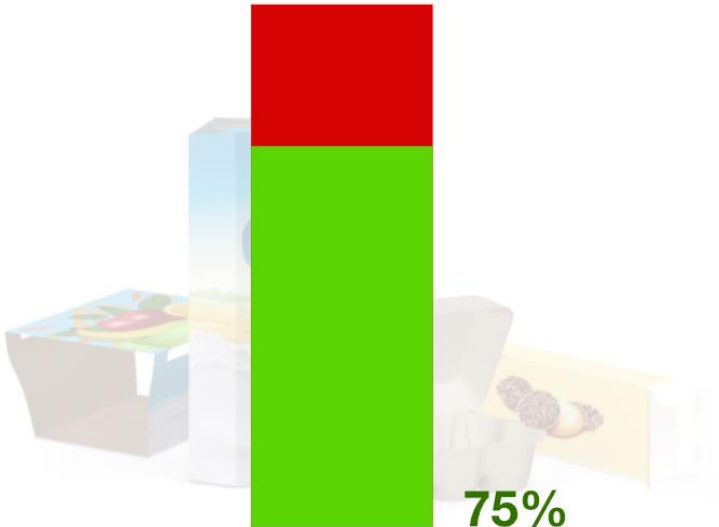
Comparison: use of recycled fibers in Europe (source:CEPI)



Newspapers



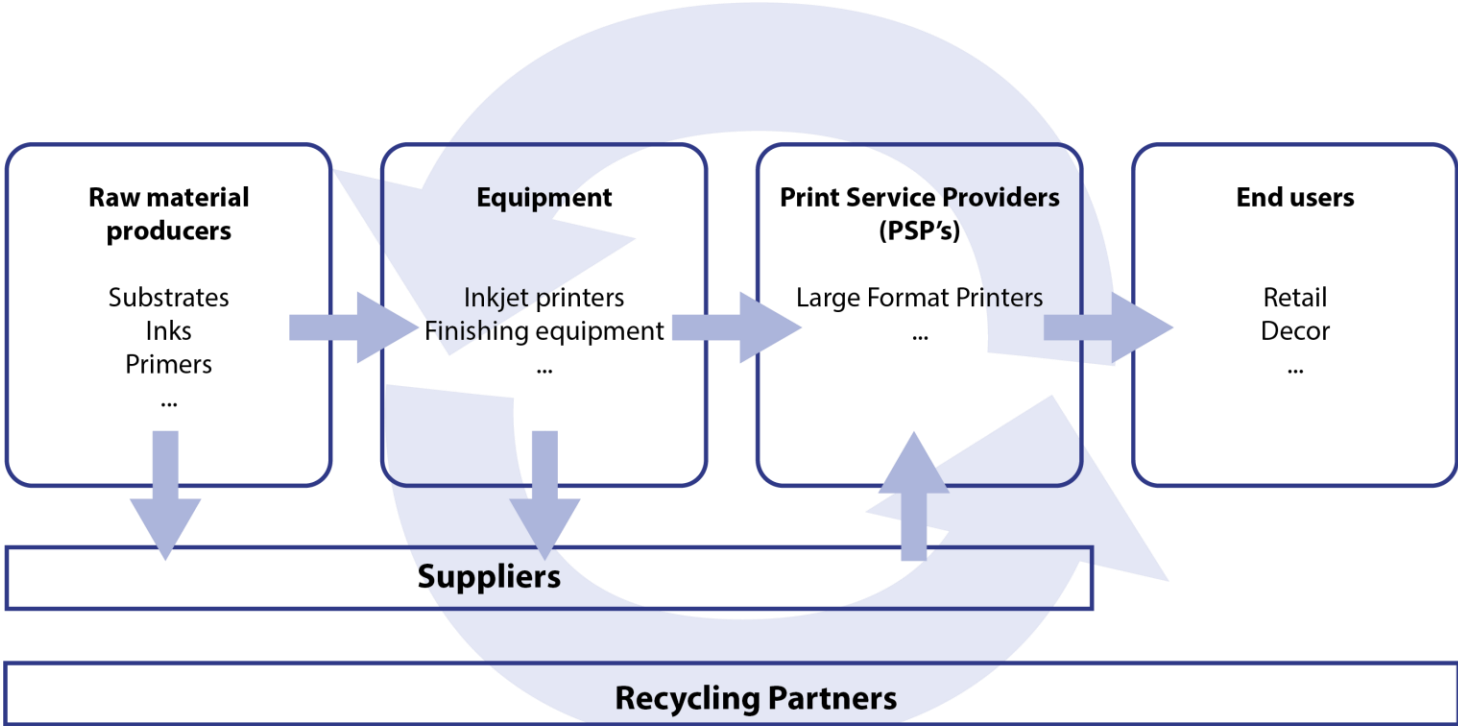
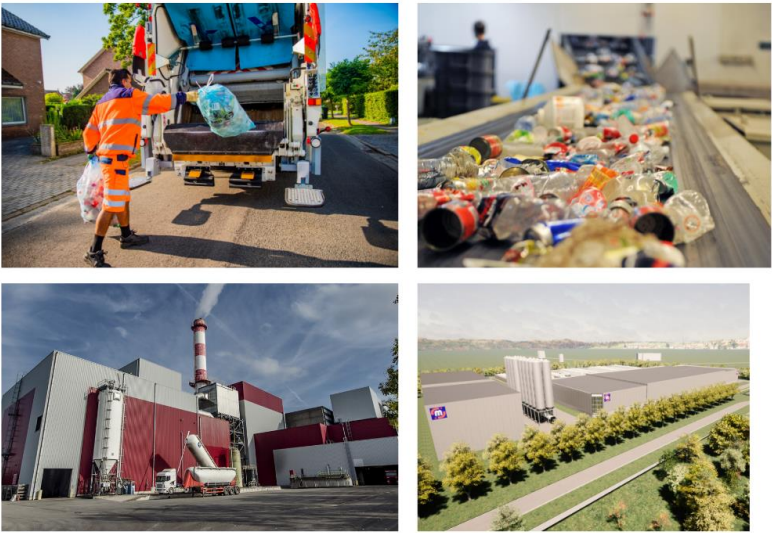
Commercial print



Packaging

# Large Format Print & Sign Circular eco-systems

Comparison: consumer packaging



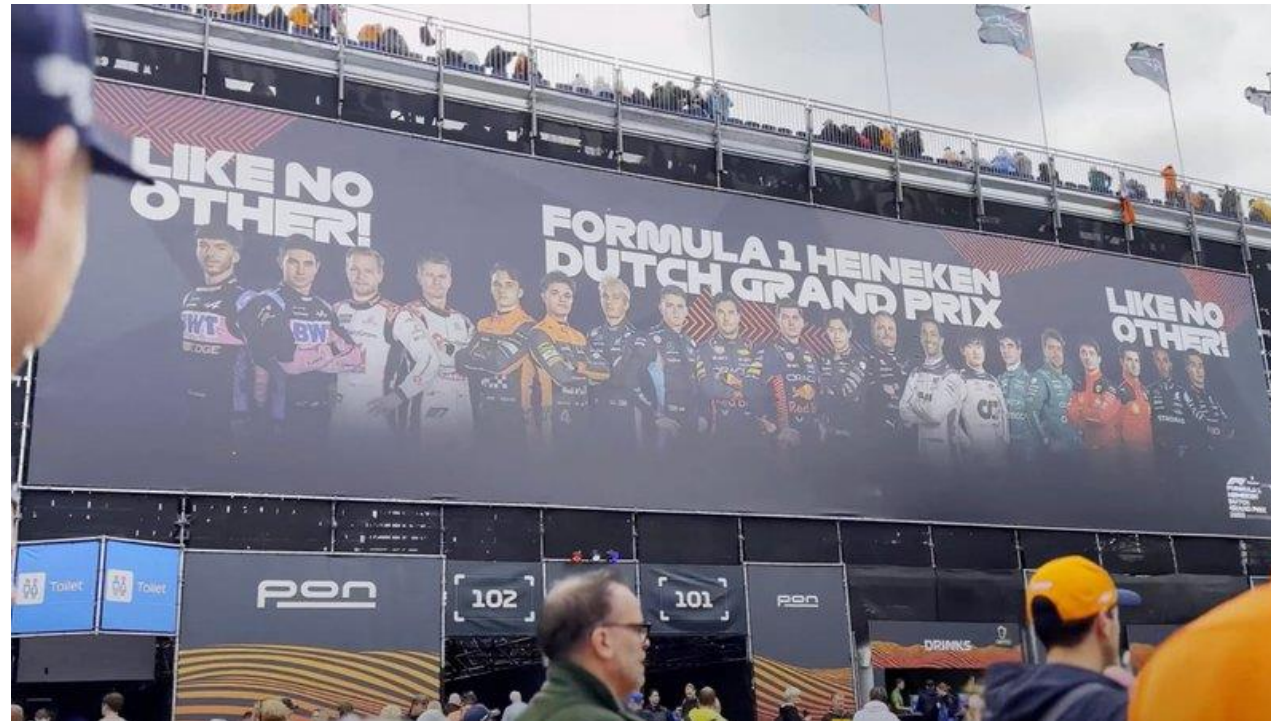
Large Format Print & Sign ?





# Large Format Print & Sign Circular eco-systems

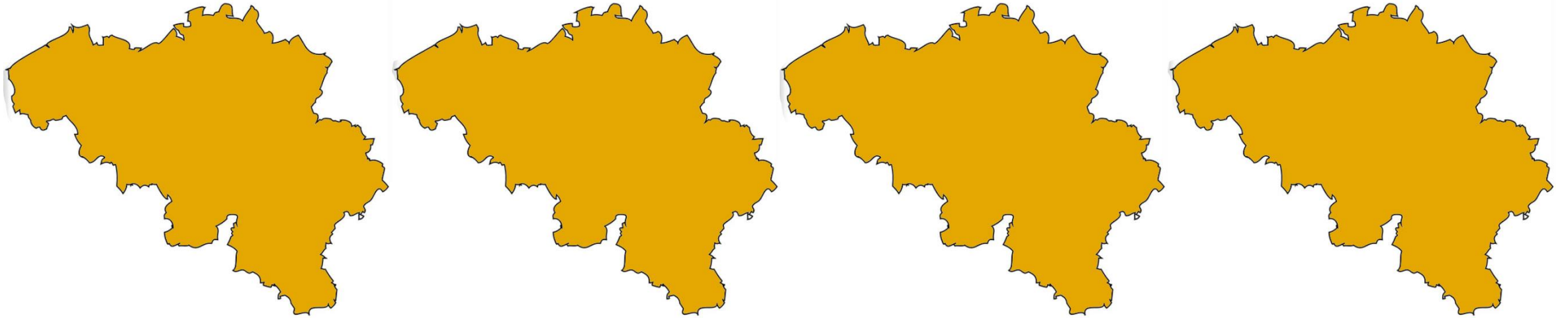
F1 Zandvoort: 25.000m<sup>2</sup> large format prints!



# Large Format Print & Sign

## Circular eco-systems

Production of a big large-format printer (m<sup>2</sup> in 1 year) !  
220 ton waste!



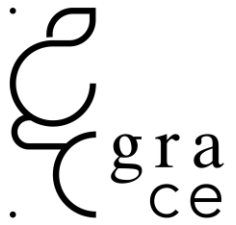
# Large Format Print & Sign

## Circular eco-systemen

What to do?



# First examples

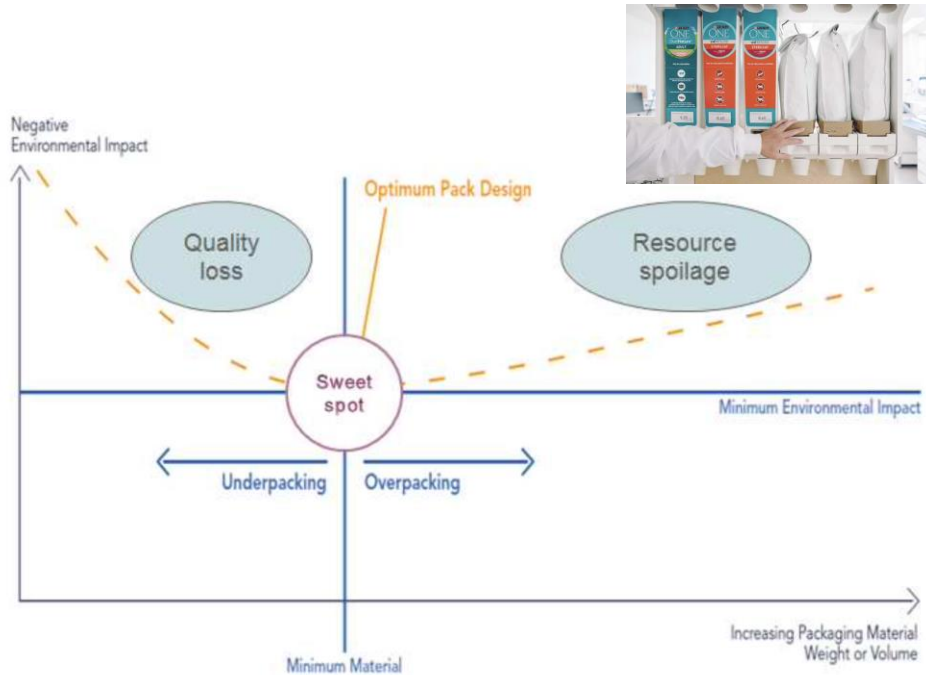


# Reduce

- Less substrate?

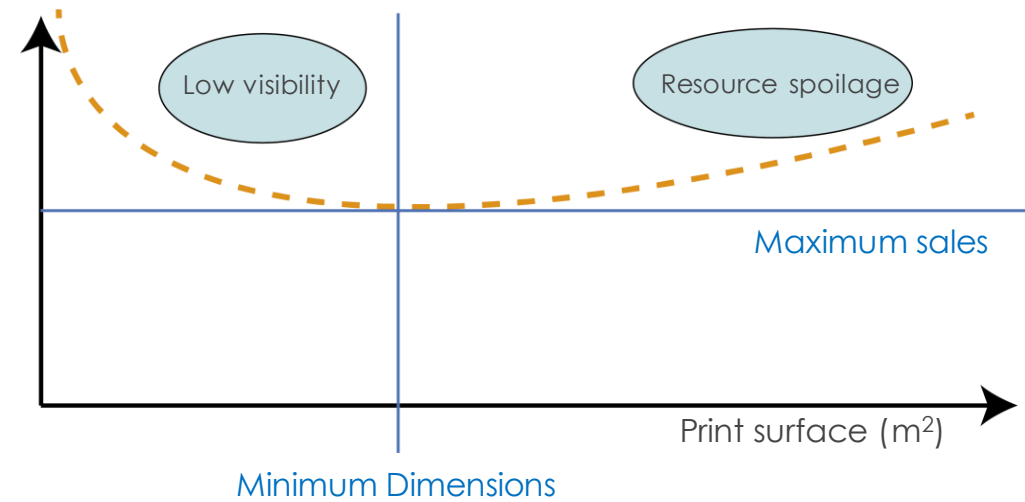
Example: packaging

(R. Witik, NRC/FST – Sustainability & Novel Packaging Nestlé)



Large format ?

Negative Sales impact



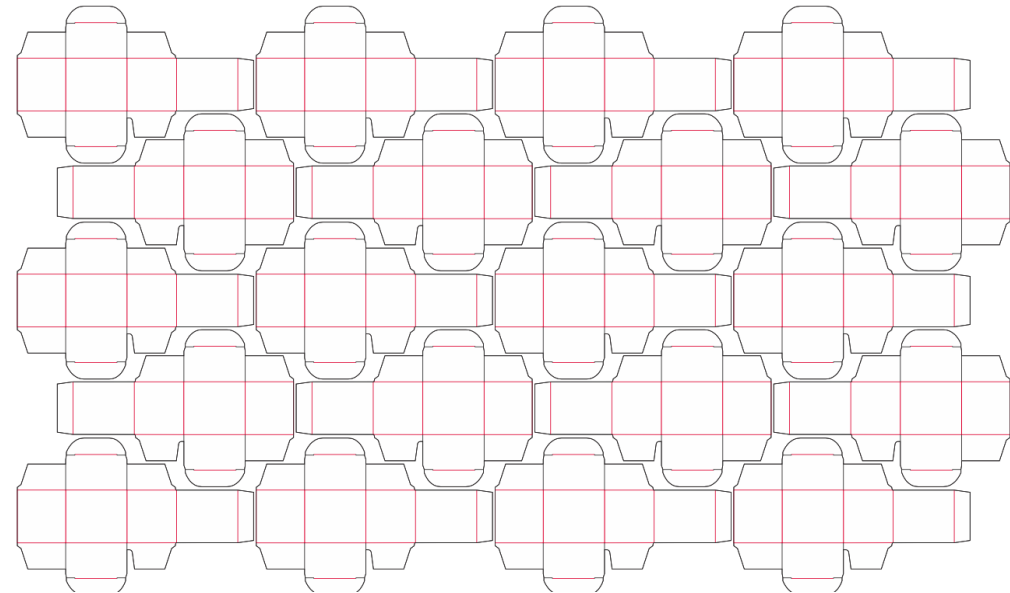
**Are these relationships suitable in large format print?**

# Reduce

- Better use of the substrate ?



Double-sided printing (source: <https://www.stickit.be/>)



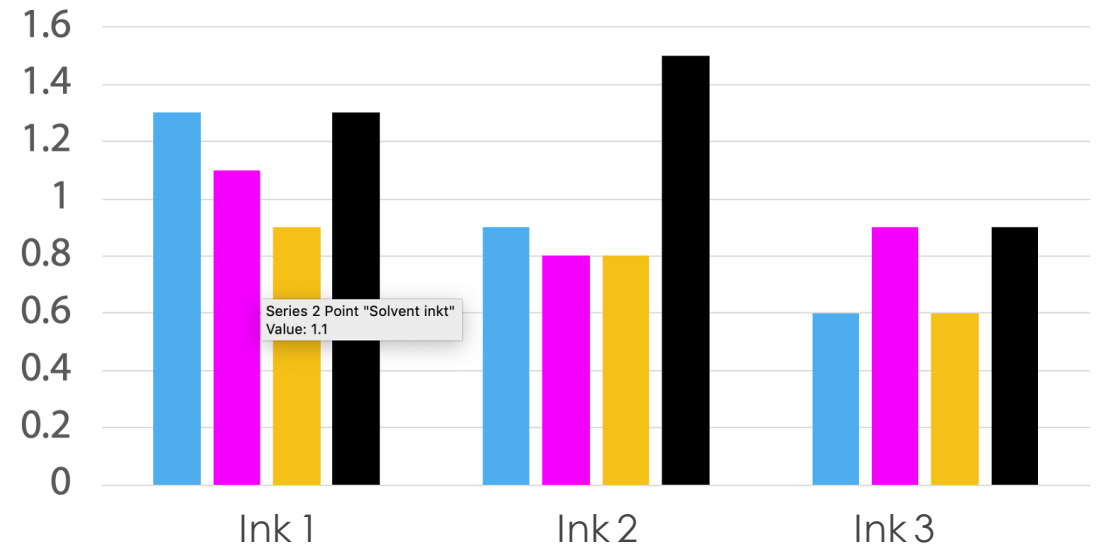
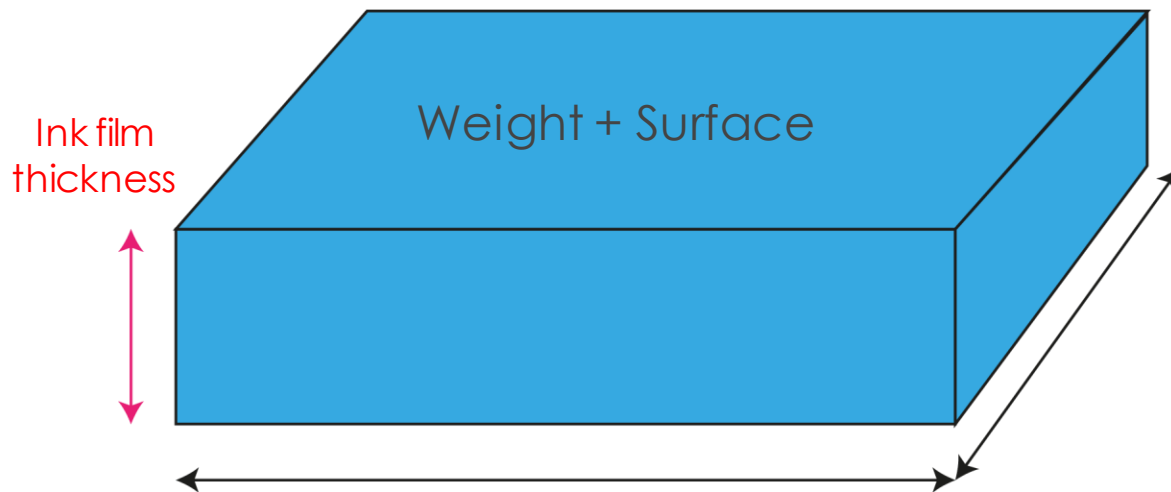
Combining printjobs (nesting, ganging,...)

# Reduce

- Less ink?

ISO 2846-1:2017

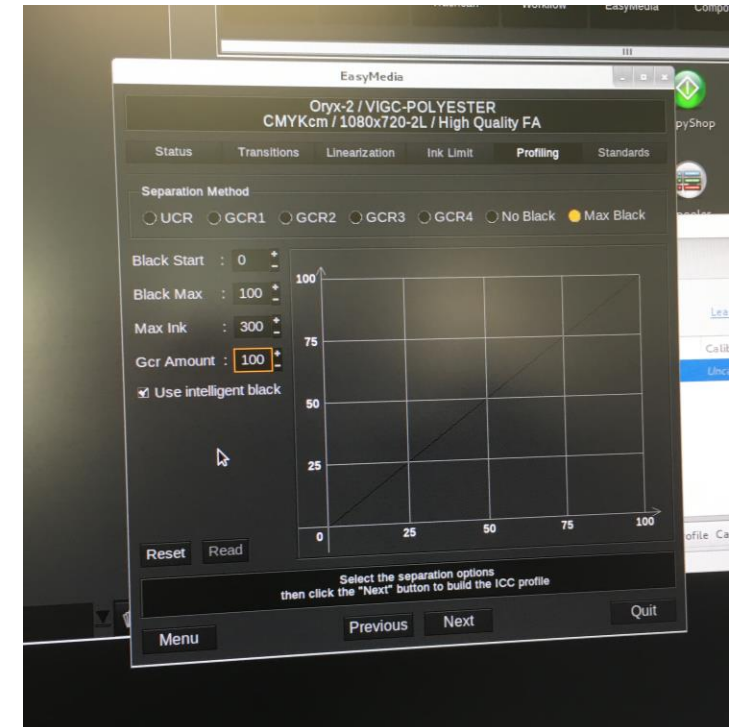
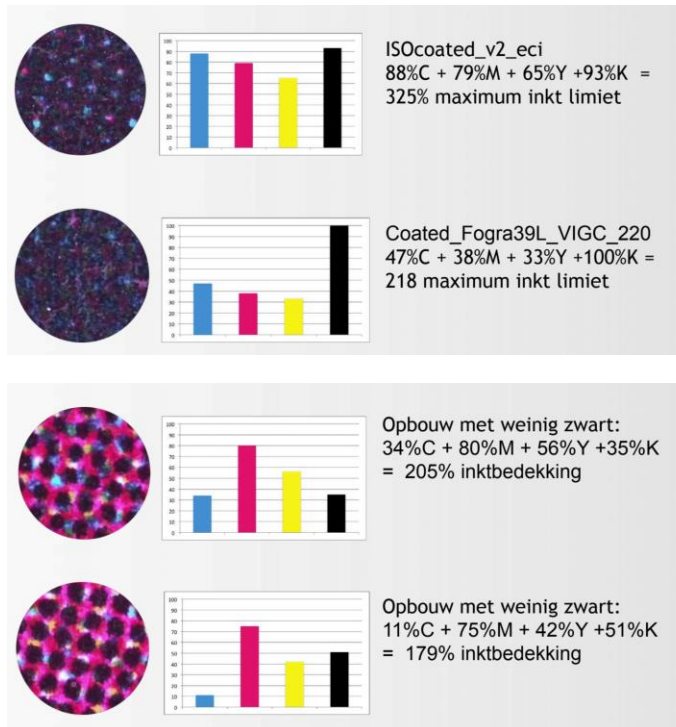
Graphic technology — Colour and transparency of printing ink sets for four-colour printing — Part 1: Sheet-fed and heat-set web offset lithographic printing



**Is determination of ink consumption usable in large format printing?**

# Reduce

- Less ink?



Ink reduction in packaging (Design For Food – 2015)



# Reuse

## Separation of layers

2 strategies for the separation of layers



```
graph TD; A[2 strategies for the separation of layers] --> B[Controlled debonding using a reversible adhesive]; A --> C[Solvent based separation];
```

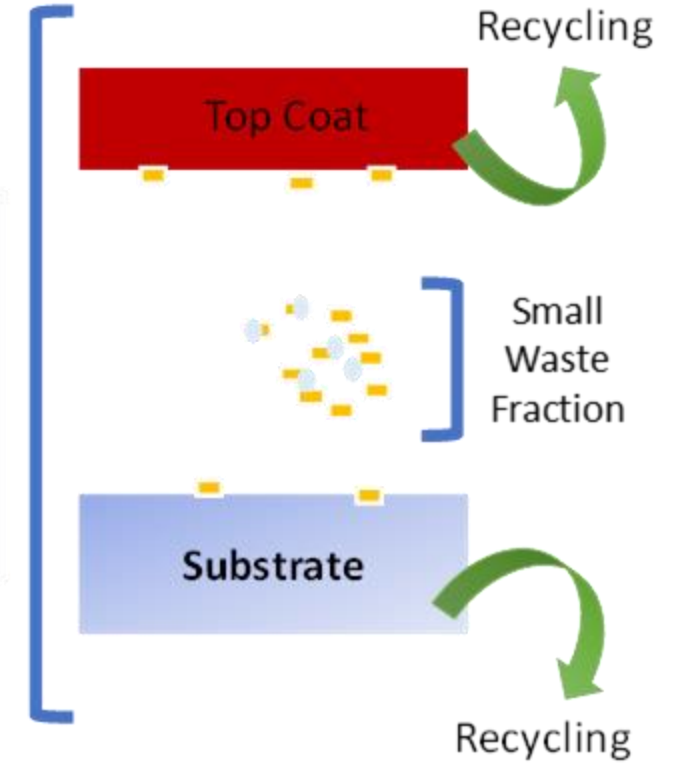
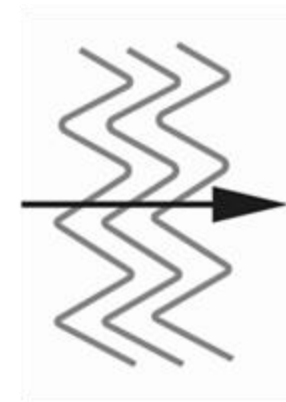
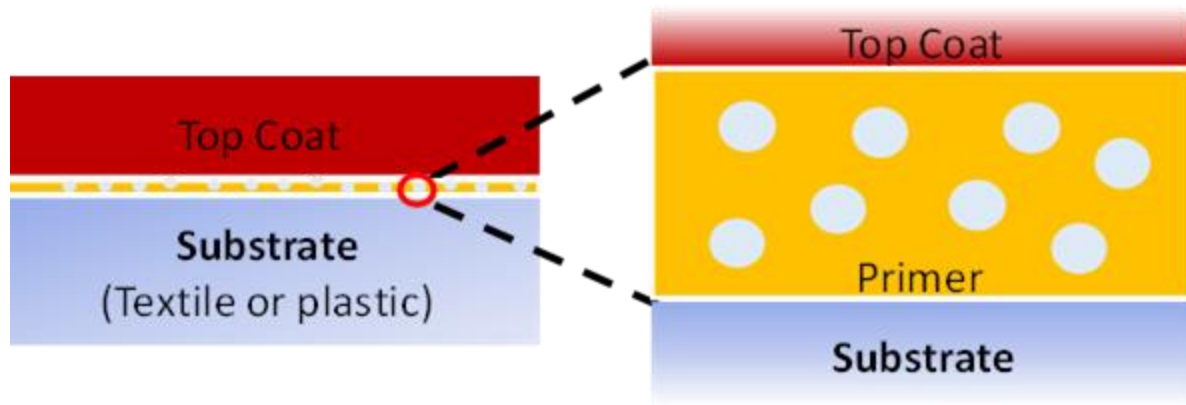
**Controlled debonding using a reversible adhesive**

Designed to recycle

**Solvent based separation**

Conventional products

# DECOAT: reversible adhesive Removal op topcoating



# DECOAT: solvent based recycling

## Removal of topcoating with solvent

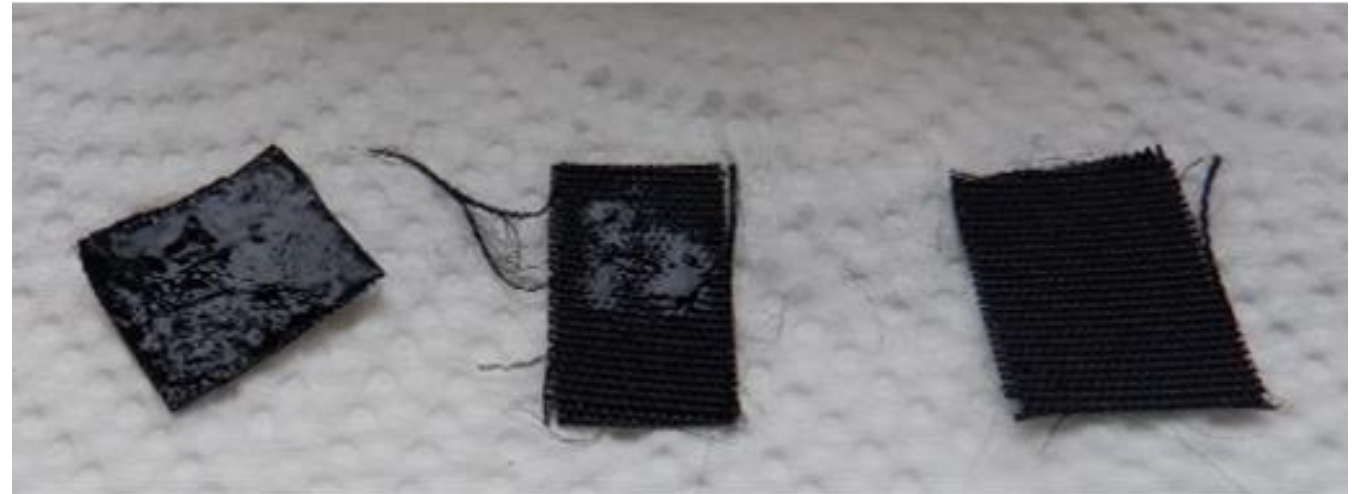
- PU, acrylate and PVC coatings
- PET and PA textile



Successful coating delamination



Not successful for silicone coating



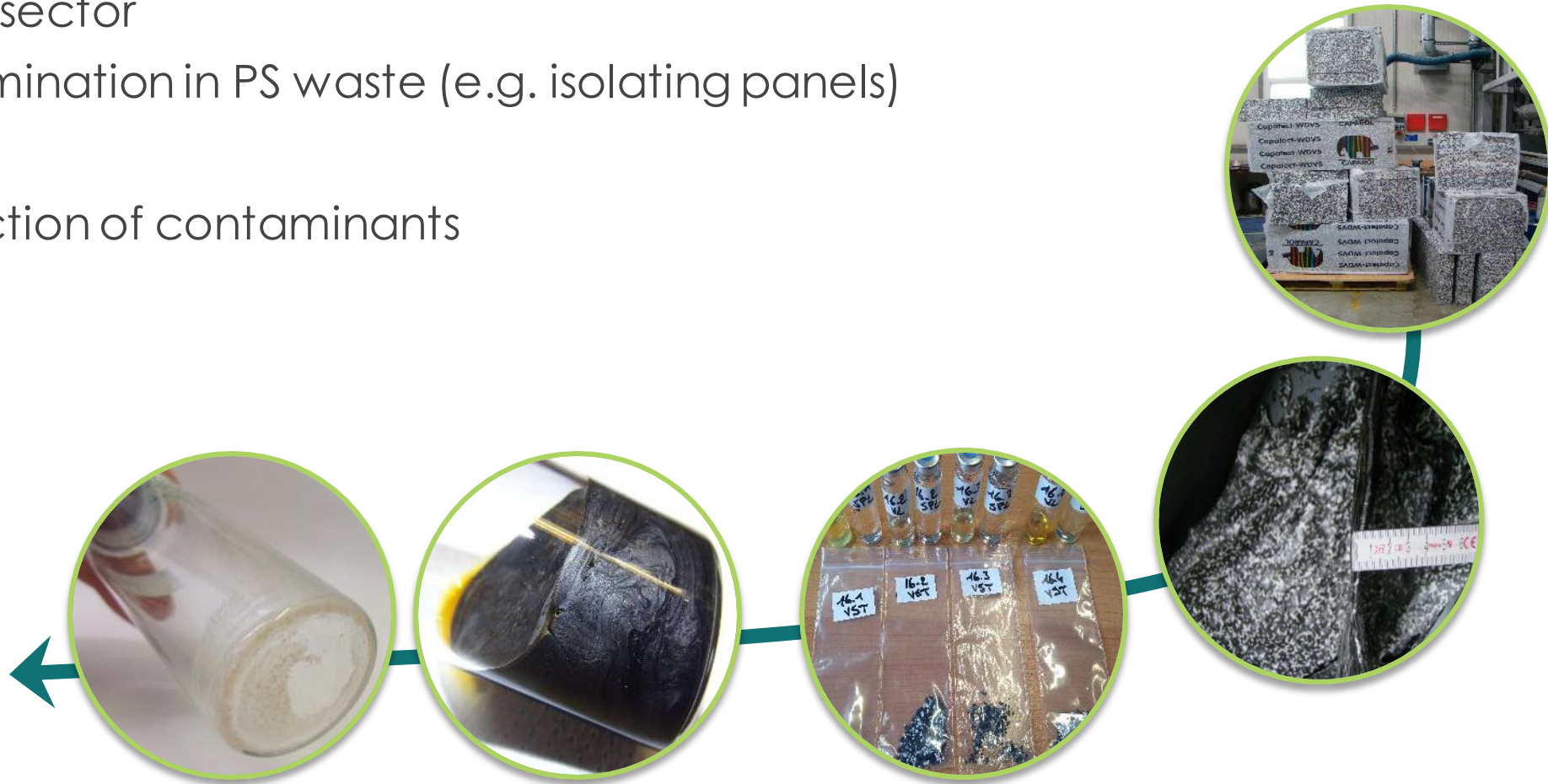
# CREATOR: Decontamination of PS

## Removal of additives

Construction sector

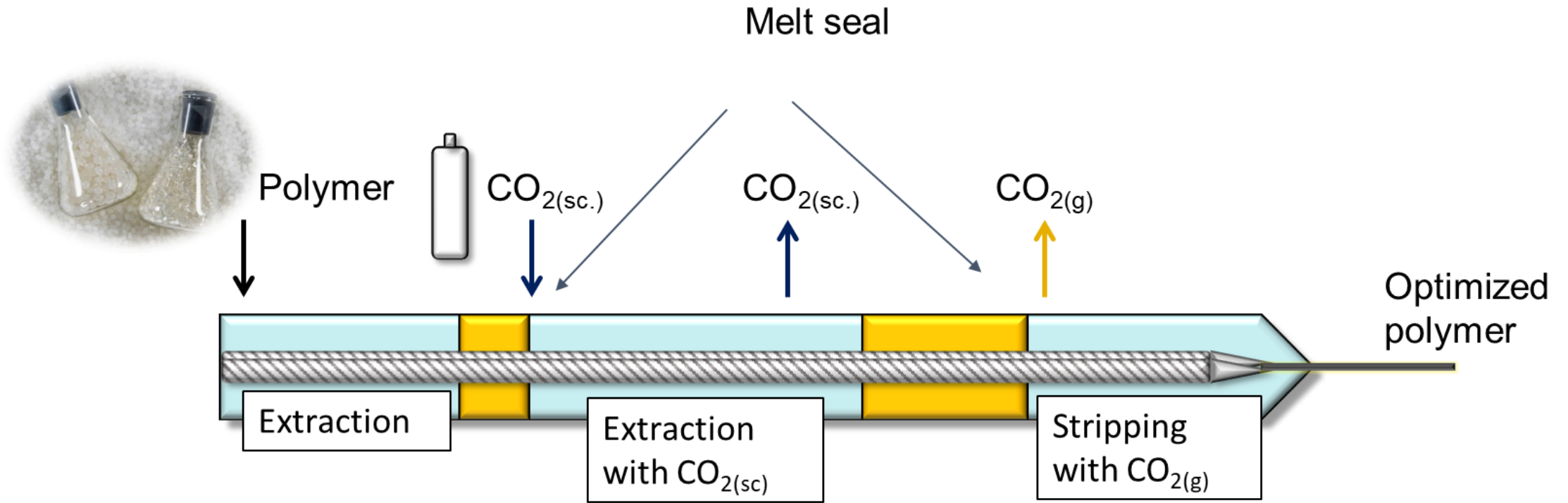
HBCD contamination in PS waste (e.g. isolating panels)

➡ Extraction of contaminants



# CREATOR: Decontamination of PS

## Extraction through extrusion



# QUESTIONS?





Willem Uyttendaele  
Onderzoeker finishing  
& coating



[wu@centexbel.be](mailto:wu@centexbel.be)

# vigc

Fons Put  
Senior Innovation  
Consultant



[Fons.put@vigc.be](mailto:Fons.put@vigc.be)