



CEFLEX

A CIRCULAR ECONOMY FOR FLEXIBLE PACKAGING

Introduction & Progress Update

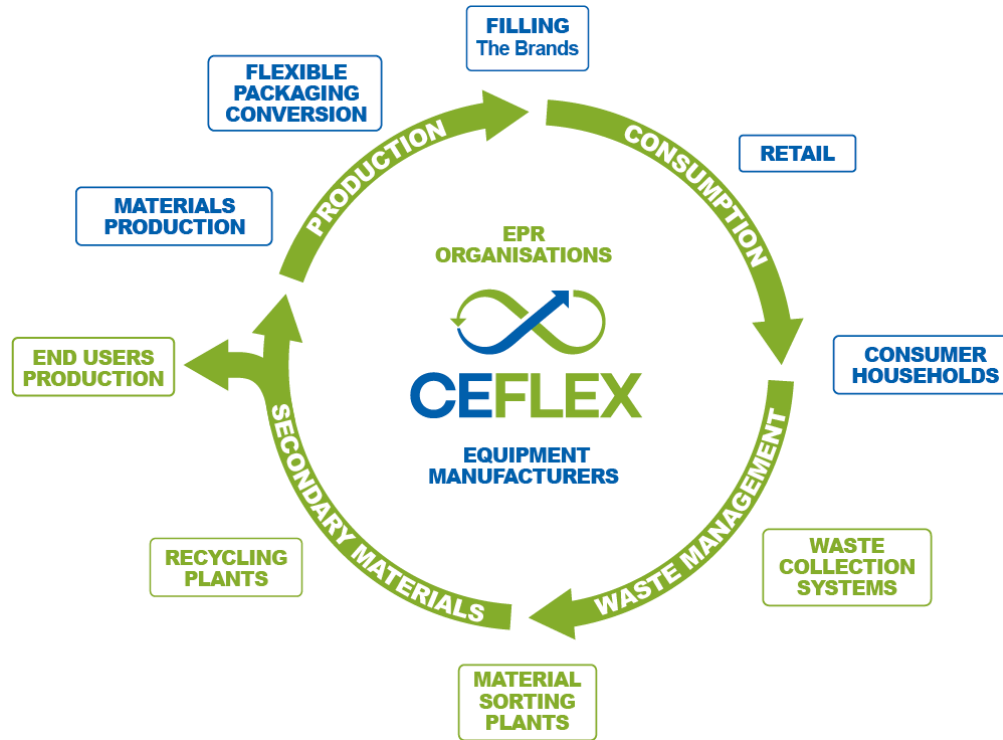
Q4 2019

Who We Are



CEFLEX is a collaborative initiative of a European consortium of companies and associations representing the entire value chain of flexible packaging to enhance the performance of flexible packaging in the circular economy.

The Value Chain



The Stakeholders

MATERIAL PRODUCERS



The Stakeholders



FILM PRODUCERS / FLEXIBLE PACKAGING CONVERTERS



The Stakeholders



FILM PRODUCERS / FLEXIBLE PACKAGING CONVERTERS



The Stakeholders



BRAND OWNERS AND RETAILERS



COLLECTORS, SORTERS AND RECYCLERS



SUPPLIERS, END USERS AND OTHERS



Our Vision for the Circular Economy



CEFLEX will further enhance the performance of flexible packaging in the circular economy by designing & advancing better system solutions identified through the collaboration of companies representing the entire value chain



- CEFLEX Vision

2020 we will have a comprehensive sustainability and circular economy roadmap for flexible packaging, including widely recognised design guidelines and a robust approach to measure, demonstrate and communicate the significant value flexible packaging adds to the circular economy.

The roadmap will address:

- resource efficiency
- waste prevention benefits
- sustainably returning recycled FP materials to supply identified end markets
- eliminating leakage through better collection

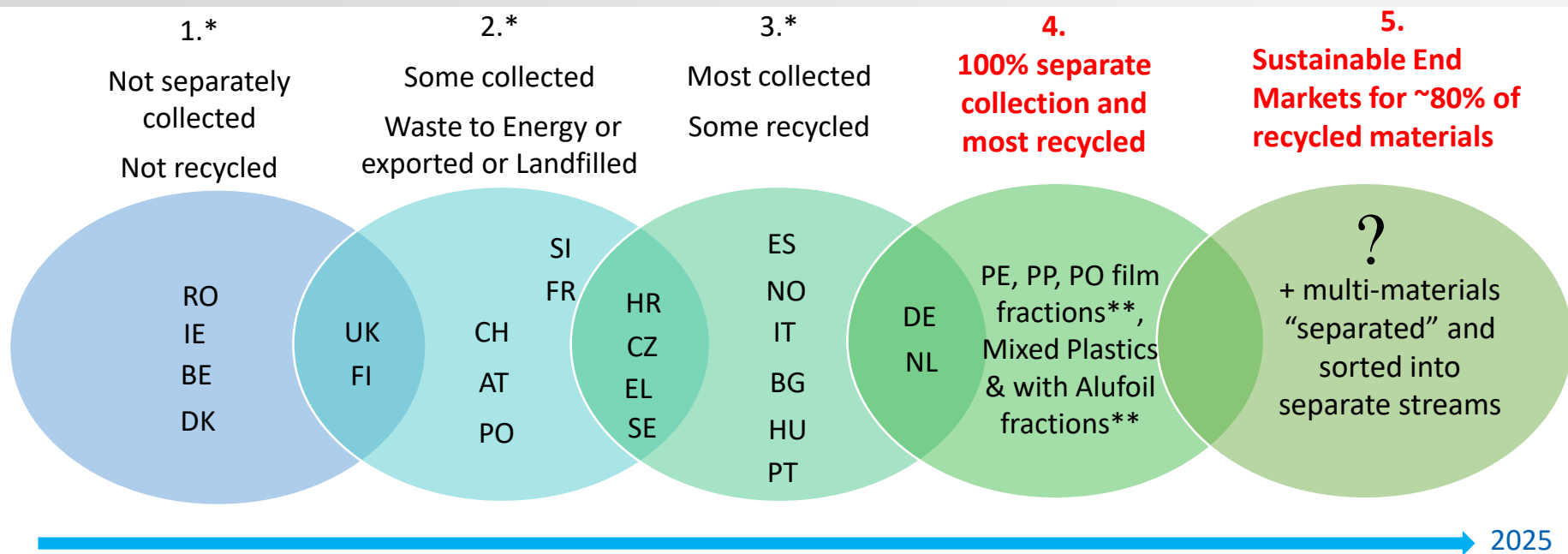
2025 there will be an established collection, sorting and reprocessing infrastructure/economy across Europe for flexible packaging based on end of life technologies and processes which deliver the best economic and environmental outcome for a circular economy.

Project Goals & Deliverables

- **2020:** Flexible packaging will be recycled in an increasing number of European countries, facilitated by the CEFLEX initiative through:
 - The development and application of robust **Design for A Circular Economy Guidelines** for both flexible packaging and the “End of Cycle” infrastructure to collect, sort and recycle them
 - The identification and development of **sustainable end markets** for the secondary materials recycled from flexible packaging
 - Proposing a **sustainable business case** in which flexible packaging can be collected, sorted, recycled and returned to the economy in quantity and at a competitive quality/price for potential end market applications.
- **2025:** The development of a collection, sorting and reprocessing infrastructure for post-consumer flexible packaging across Europe, facilitated by the CEFLEX initiative through:
 - Implementation of a robust **business case** that supports the development of the circular economy in which flexible packaging is seen as a relevant and responsible packaging choice.
 - Successful **pilot projects** to demonstrate “proof of principle”

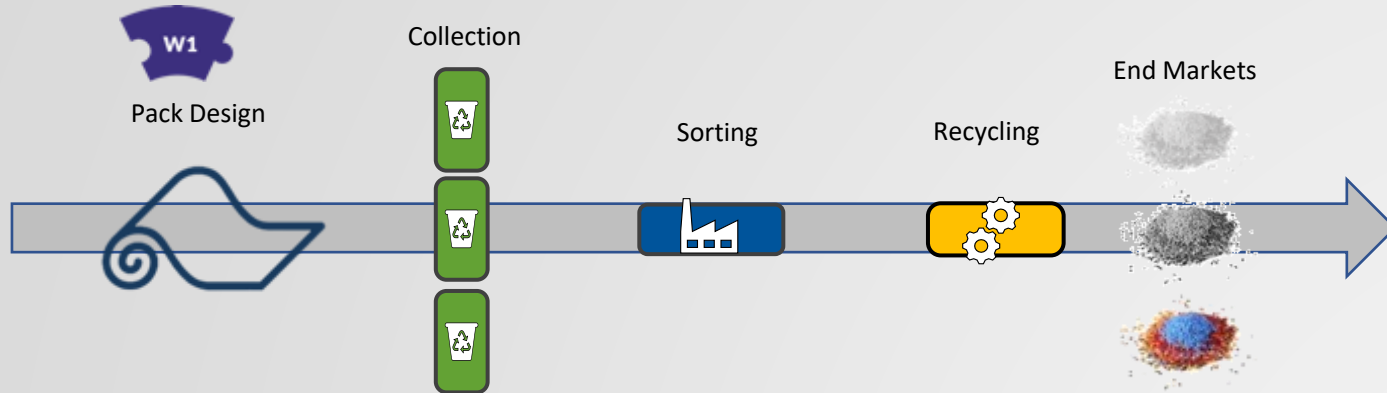


EU FP EOL Landscape & CEFLEX Ambition



* Need to further validate country practices with EXPRA ** Actual fractions still to be confirmed in W3

Our 7 Interdependent Workstreams



Workstream 1: Designing flexible packaging for collection, sorting, recycling AND future end markets

Workstream 2: How much of each material enters the market (in tonnes)



Design for A Circular Economy (D4ACE) Guidelines for flexible packaging



D4ACE Guidelines

For packaging developers and
the end of cycle value chain



D4ACE Pack Assessment Tool



Future-proofing

Process to update the
D4ACE Guidelines



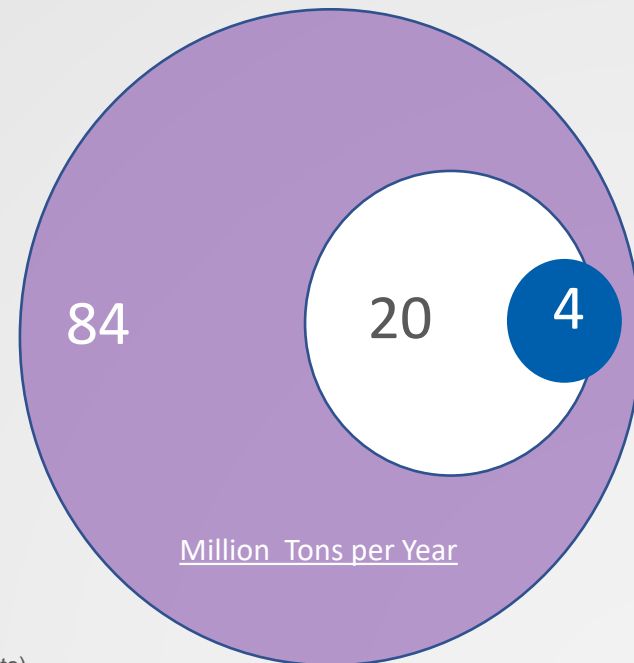
Economic and Environmental impact in a Circular Economy



What does the European Packaging market look like?



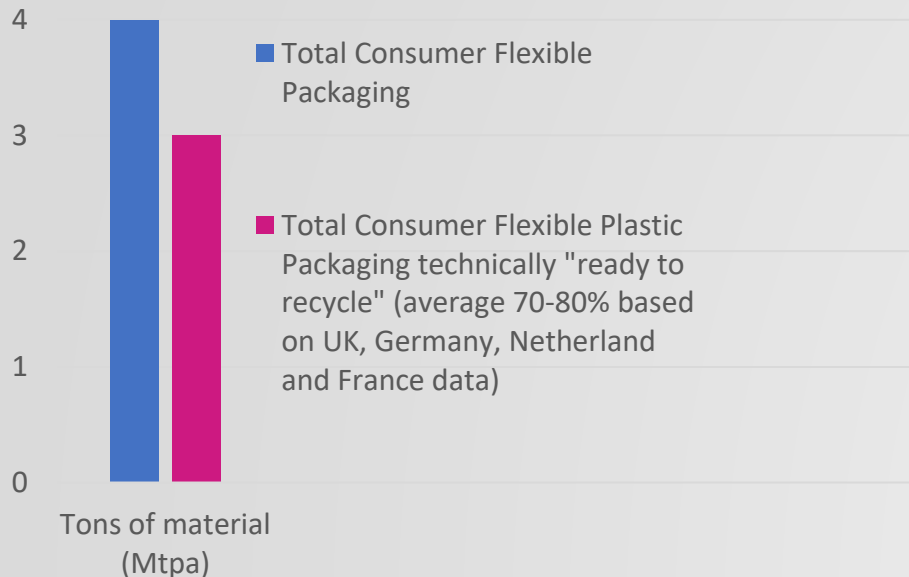
- Total EU packaging market: c.a. 84 M T*
- Total EU plastics packaging: c.a. 20 M T**
- Total EU consumer flexible packaging: 4 M T***
 - Not yet collected everywhere in Europe and majority is sent for energy recovery (or landfilled)
 - Sorting and recycling solutions developed in EU can be relevant globally



Eurostat 2015 data, ** 19.55 Mtpa. Plastics – The facts 2016 -2015 data, *** 2016 data. 3.987 Mtpa (incl. exports).

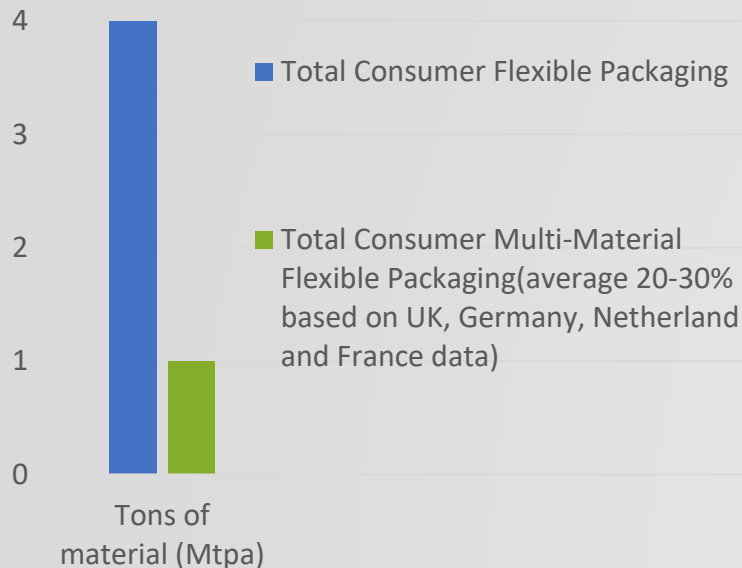
Calculated by CEFLEX, based on Plastics – The facts 2016 and FPE Market Report Summary 2016

The European Flexible Packaging Market in 2016



- Approximately 3 M T of consumer flexible packaging is mono PE or PP material or a PE/PP mix, and it is technically “recycling ready” if it can be sorted into PE or PP film fractions or a mixed PE/PP fraction
- Flexible packaging with aluminium as the dominant material can be sorted into the aluminium fraction and recycled

The European Flexible Packaging Market in 2016



Multi-material flexible packaging (incl. PE, PP, PA, PET, Alu, paper, etc) represents 0.8 – 1 M T

Today

- Predominantly sent for Recovery as SRF (cement kiln) or RDF (Waste to Energy)
- When Aluminium present, can be sorted recycled using pyrolysis

Future

- Recycle structures with compatible polymers : ex PE/PP and PE or PP /selected barrier with or without a compatibiliser
- Recycle with chemical recycling and other new/existing recycling technologies: eg solvent separation, pyrolysis etc that have been/are being developed and rolled out
- Re-design the packaging, where possible, to be recycled with existing recycled fractions



1. Collection of flexible packaging is essential to recycling

If it is not collected, it cannot be sorted for recycling.

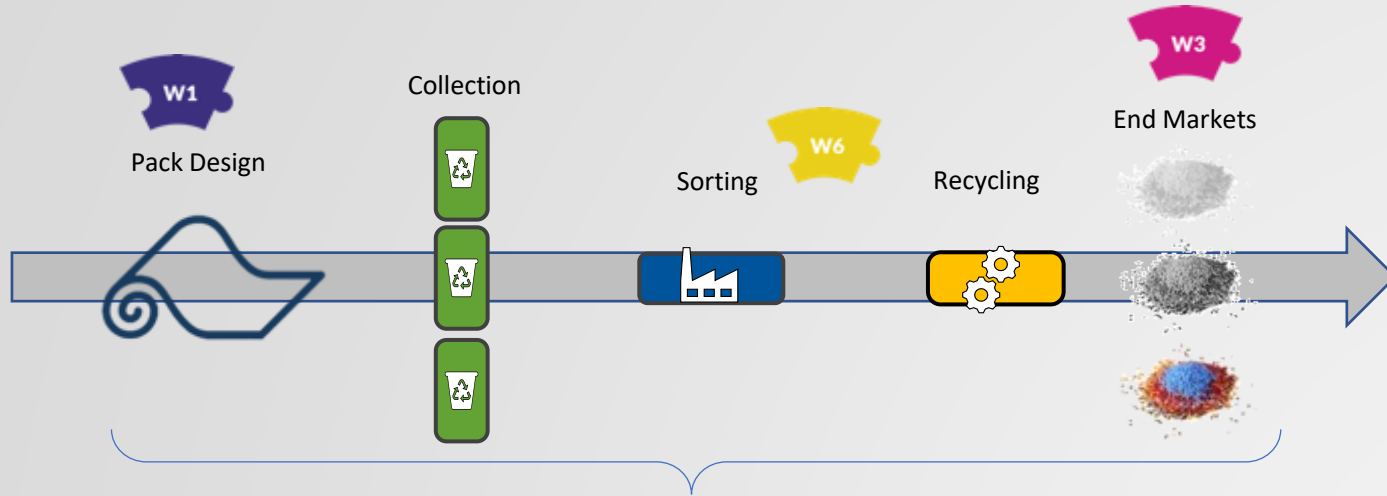
2. Sorting needs re-design to include post-consumer flexible packaging

~70% is mono PE or PP which, once sorted, can be recycled.

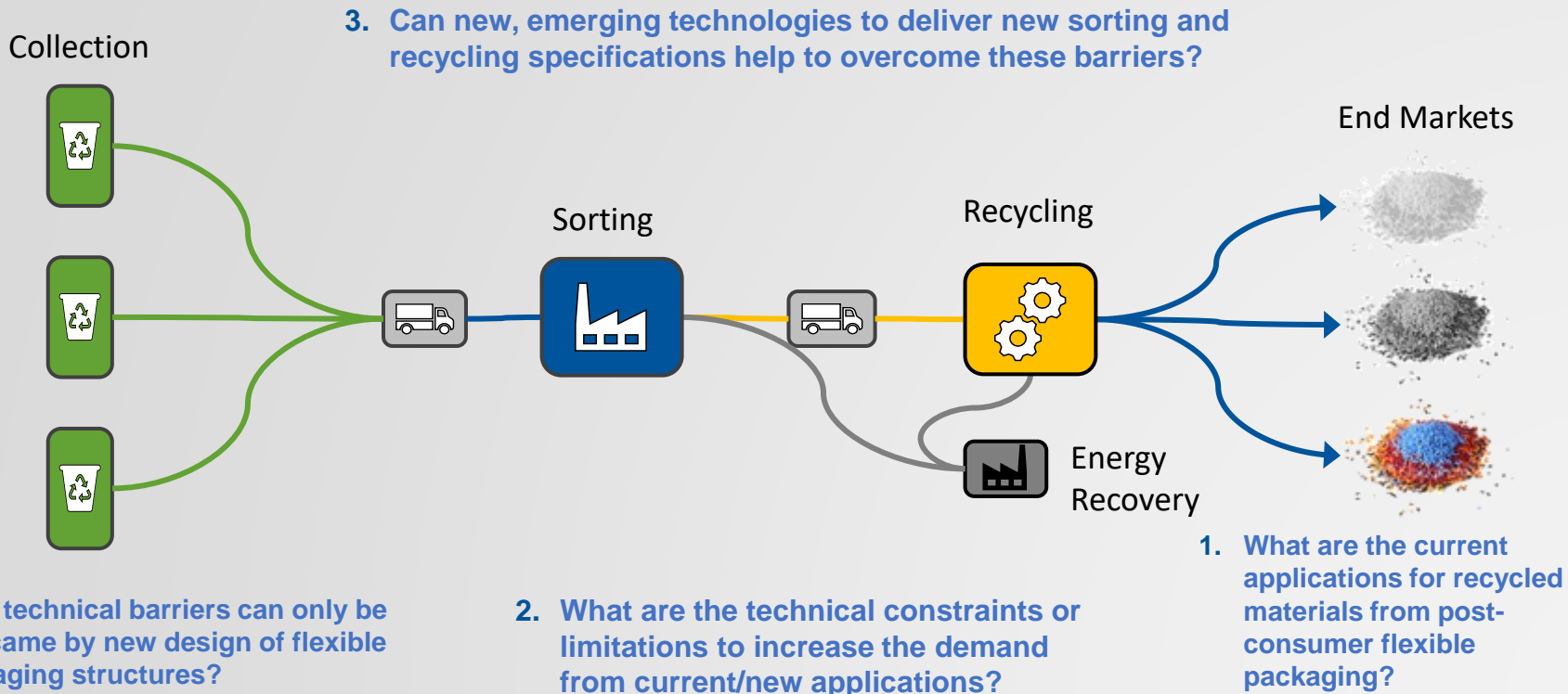
3. Improved design, collection, sorting & recycling solutions* need to be developed/more widely available for the ~30% of flexible packaging which is multi-material/multi-layer with barrier properties.

*This relatively small quantity of multi-material/multi-layer flexible packaging can prevent countries from collecting all flexible packaging.

Our 7 Interdependent Workstreams



Workstreams 3 & 6: Determining which end markets can/will use materials from recycled FP, what their quality needs are and what quantities they can consume AND what new technologies can help deliver these.



Identify, communicate and support the rollout of technologies which contribute ...

BETTER OUTPUT | ENABLE RECYCLING



Design*



Sorting



Recycling

Washing
Separation

Mechanical, Chemical recycling

Easy to empty

Recycled content

Digital bar-codes**

Layers separation
• Dissolving polymers
• Delamination

Deinking/Deodorisation

Adapt design for purpose

Recycling: compatible inks & adhesives

Enhanced NIR**

Chemical recycling
• Pyrolysis to feedstock
• Gasification

Down-gauging

Facilitate separation of materials

2D / 3D sorting**

Pyrolysis for Aluminium recovery

Layer optimisation

Magnetic Density Separation**

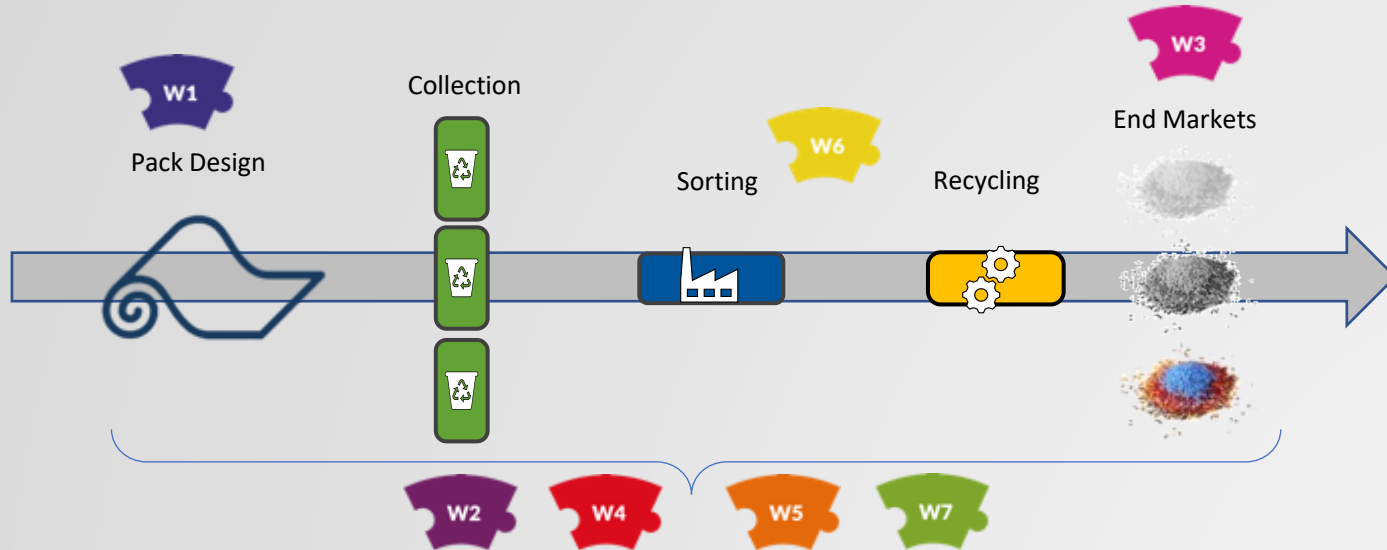
Compatibilisers*

High-speed flake sorting**

Improved washing**

....to circular economy solutions

Our 7 Interdependent Workstreams



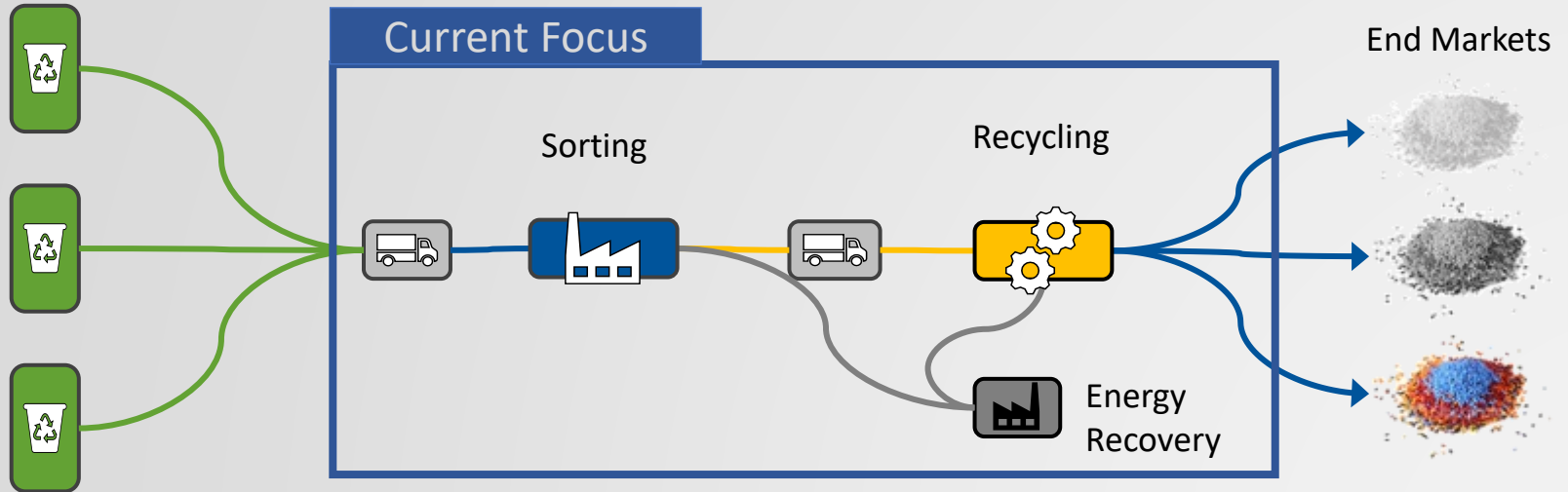
Workstream 4: What does a sustainable Business case look like?

Workstream 5: Showing proof of principle for W4 through regional pilots

Workstream 7: Getting the message out to all parts of the FP Value chain

Understanding the best "End of Cycle" options for flexible packaging

Collection



in terms of **Economic and Environmental impact**



Show “Proof of Principle” in pilot plant/region/country



- Pilot wide collection of flexible packaging and increase recycling of flexible packaging in a lead region/country by 2021
- Provide “proof of principle” for identified best practice and possible business models developed as part of W4

On-hold pending external funding:

- Clarifying W1 and W6 testing and pilot requirements
 - Identifying specific stakeholder pilots



Communication: Stay in touch!



.....more to come!

Our changing world



Polyolefins Circular Economy Platform

CEFLEX actively monitors and where appropriate collaborates with all the European high-level initiatives to ensure alignment and compatibility of the work developing the D4ACE Guidelines and “end of cycle” systems and infrastructure.

For more information

www.CEFLEX.eu

If you want to become part of the CEFLEX consortium or wish to learn more about the initiative, contact

info@ceflex.eu

Or you can also contact the consultants team:

Graham Houlder
Project Co-ordinator
graham@ceflex.eu

Dana Mosora
Workstream Consultant
dana@ceflex.eu

Liz Morrish
Workstream Consultant
liz@ceflex.eu

Michael Minch Dixon
Workstream Consultant
Michael@ceflex.eu