



**TEPPFA**

The Plastic Pipes and Fittings Association



LyondellBasell, Pipe Customer Event  
*Putting Circular Economy into Practice*

11-12 October 2023

**Ludo Debever**  
TEPPFA General Manager

## Plastic pipes for building and infrastructure

Founded >30 years ago TEPPFA members represent:

- **350 production sites** in EU 27 + UK, N & CH
- Volume: **3 million tonnes** of plastic pipes
- Combined annual sales: **12 billion euros**
- Employment: **40,000**

**= ± 65 – 70% of EU market**



The leading voice of plastic piping systems in Europe

visit our new website today



TEPPFA has a plastic material neutral position.

# Agenda

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1. Regulatory Environment EU 2019-2023
2. Putting Circular Economy into Practice
  - 2.1. The TEPPFA Strategy
  - 2.2. Intensifying Collection and Sorting in EU
  - 2.3. Opening-up EN Plastic Pipe Standards for More Recycled Content
  - 2.4. Design for Recycling Guidelines
  - 2.5. Current Uptake of Recycled Content by TEPPFA Members
  - 2.6. Difficult to Recycle Plastic Pipe Waste
3. Conclusion



# 1. Regulatory Environment EU 2019-2023

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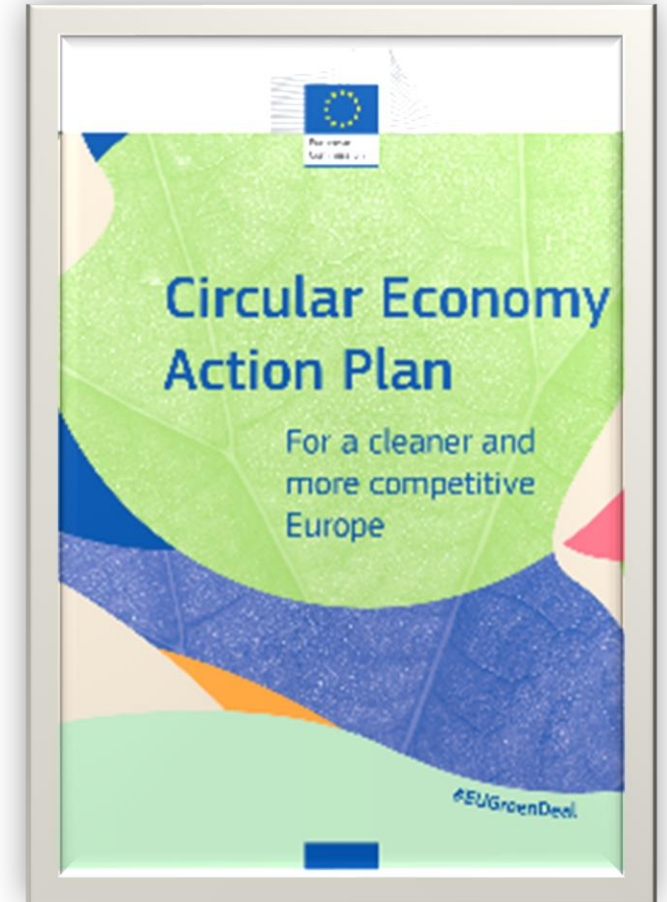
11-12 October 2023

# EU Green Deal: legislation beyond circular economy



## New Circular Economy Action Plan (CEAP)

- One of the main pillars of the EU Green Deal
- Initiatives along the entire life cycle of products.....aiming to ensure that the resources used are kept in the EU economy for as long as possible.
- Key Industries: packaging, **construction materials** and vehicles
  - Roadmap incl. mandatory requirements on recycled content



## The Circular Economy Action Plan (CPA)

- A voluntary plastic value chain action plan to **boost the uptake of recycled content in new plastic products** put on the EU market to 10 million tonnes by 2025.
  - Part of European Strategy for Plastics in a Circular Economy (2018) (≠ The Green Deal)
    - Overall objective: reduce plastic waste
  - Voluntary Action plan facilitated by the European Commission (DG GROW)
- Mandate 584 from the European Commission to CEN to develop **Design for Recycling Guidelines**
  - CEN/TC 155 WG25 (deadline August 2025)
- Current focus mainly on Member State level and National Plastic Pacts
  - Packaging





## The Circular Economy Action Plan (CPA)

### TEPPFA Pledge

- **220,000 tonnes uptake** of recycled content in new pipes by 2025 by TEPPFA members
  - Overall market = 340,000 tonnes. TEPPFA = 65 – 70% of the market

- **Volume split per polymer**

[kt/y]	2022 survey	2025 Pledge
PVC	47	59
PE	178	139
PP		22
<b>Total</b>	<b>225</b>	<b>220</b>



- **Conditions**

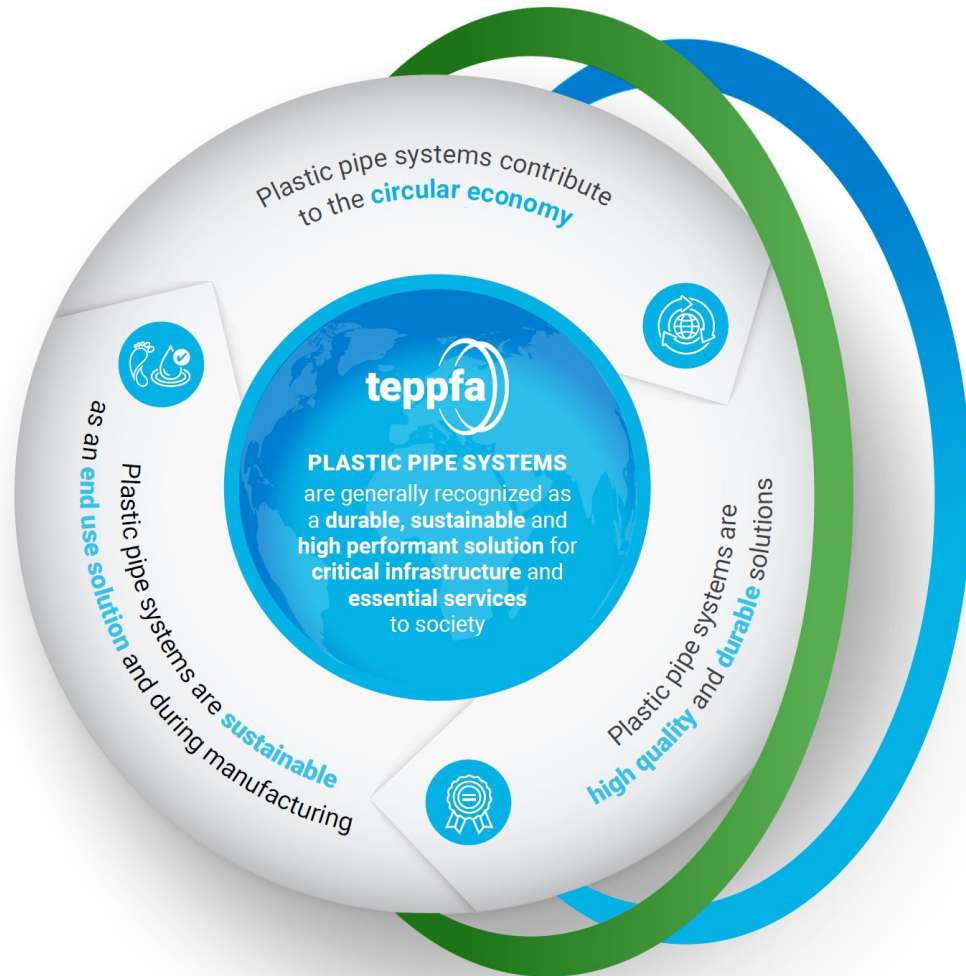
- ISO 14021 definition ‘recycled content’: incl. pre-consumer waste (by-products/own rework excluded)
- Legacy additive decisions based on science (Brominated Flame Retardants, stabilisers,.....)
- No compromise on quality & performance (longevity, mechanical properties, hygienic requirements)
- **Sufficiently available recycled materials at quality level fit for intended use**

## 2. Putting Circular Economy into Practice

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## TEPPFA vision – Must win battles



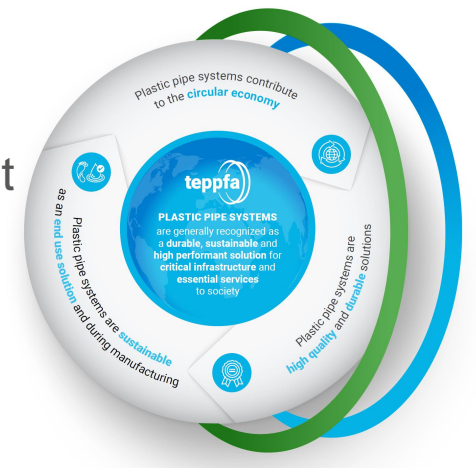
### TEPPFA contributes to UN SDGs



## TEPPFA vision

### Must win battle 1 - Plastic pipe systems contribute to the Circular Economy

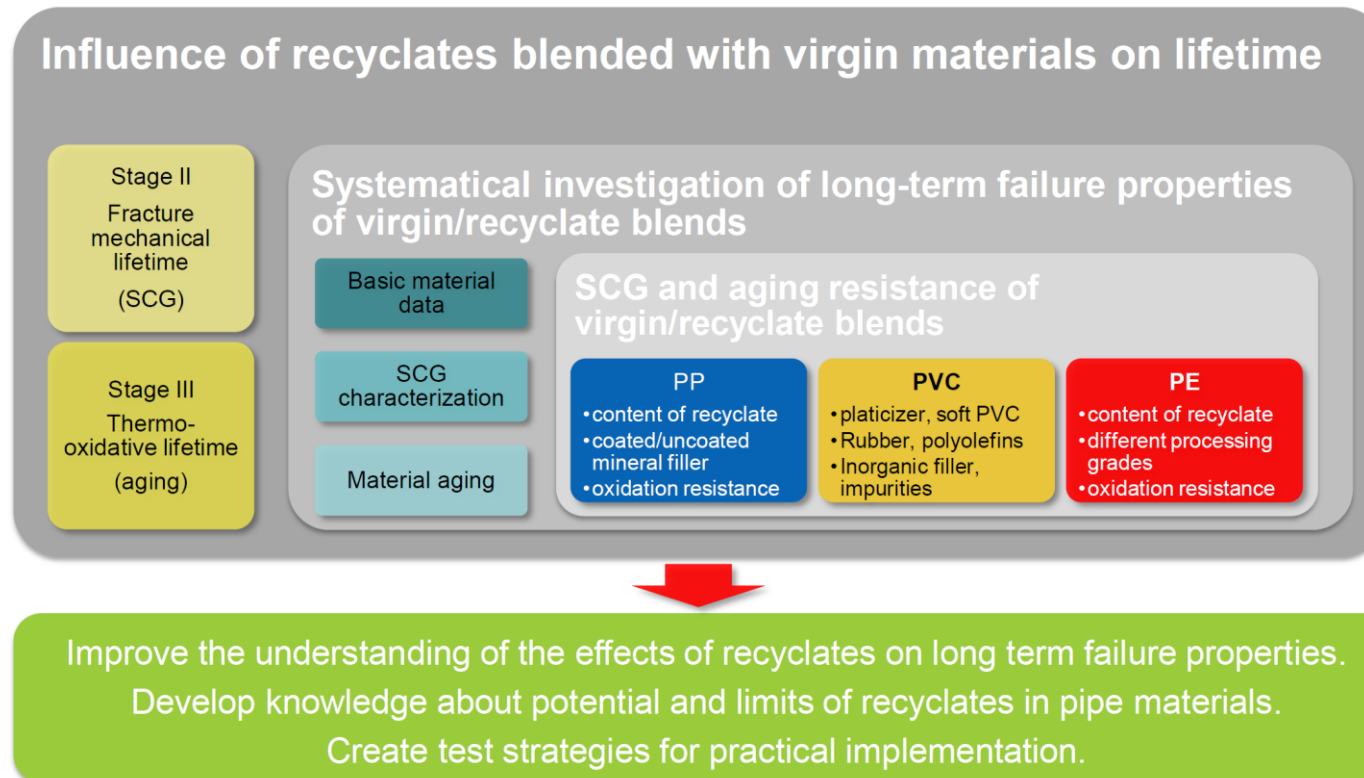
- We pave the way to increase use of recycled content / material in plastic pipe systems in Europe all whilst maintaining the performance of our systems
  - Maximized proportion of recycled share in our products
  - Rules which require defined performance replace rules that bar recycled content
- We ensure that our products will be designed for the circular economy
- We will monitor technologies supporting the circular economy, such as mechanical and chemical recycling



## Maintaining the performance of our systems

- TEPPFA joined COMET programme of PCCL (Polymer Competence Center Leoben, Austria) to develop in situ test for the quality of recycled input material

### Project objective



## Intensify collection and sorting in Europe

### ➤ Low volumes in existing voluntary collection schemes

- Germany: KRV outsourced to PreZero
- The Netherlands: B.I.S. “Pipe Collection Scheme”
- Denmark: WUPPI – PVC only. All PVC building applications
- Austria ÖAKR: Austrian Plastic Pipe Collection scheme
  - Mainly installation waste, less End-of-Life



### ➤ TEPPFA and its National Associations currently investigate the Mass Flow Model of End of Life plastic pipes in some selected countries: DE, UK, NO and ES

### ➤ France - 1 May 2023 EPR scheme for all EoL Building Products (excl. Infrastructure)

## Example, EN 13476

### Materials



**Table 2 — Compound / formulation characteristics of PP pipes and injection-moulded fittings**

Characteristic	Requirements	Test parameters		Test method
Resistance to internal pressure, 140 h <sup>abc</sup>	No failure during the test period	End caps	Type A or Type B	EN ISO 1167-1 and EN ISO 1167-2
		Test temperature	80 °C	
		Orientation	Free	
		Number of test pieces	3	
		Circumferential stress	4,2 MPa	
		Conditioning period	Shall conform to EN ISO 1167-1	
		Type of test	Water-in-water	
Test period	140 h			
Resistance to internal pressure 1000 h <sup>abc</sup>	No failure during the test period	End caps	Type A or Type B	EN ISO 1167-1 and EN ISO 1167-2
		Test temperature	95 °C	
		Orientation	Free	
		Number of test pieces	3	
		Circumferential stress	2,5 MPa	
		Conditioning period	Shall conform to EN ISO 1167-1	
		Type of test	Water-in-water	
Test period	1 000 h			
Melt mass-flow rate	≤ 1,5 g/10 min	Temperature	230 °C	EN ISO 1133-1:2011
		Loading mass	2,16 kg	
Thermal stability, OIT	≥ 8 min	Temperature	200 °C	EN ISO 11357-6

## Example, EN 13476

Paragraph D.2 draft modification proposal incl. proposal to delete D.2.2 submitted to CIB

### Paragraph D.2 draft modification proposal

#### **D.2 Agreed specification**

The use of recyclates with an agreed specification, is permitted provided that

- all conditions specified in Table D.1 and clause D.3 are met.
- the agreed specification, including maximum batch size, characteristics and permitted deviations, shall be defined on basis of the type testing results from the used formulation.
- the agreed specification includes sampling procedures, sample preparation methods and testing frequencies.

#### Paragraph D.2.2 will be deleted

#### ~~D.2.2 Material from PP products other than pipes and fittings~~

~~External reprocessed and/or recycled material from PP products, other than pipes and fittings, shall not be used for the production of pipes and fittings conforming to this standard.~~





## Opening-up EN Plastic Pipe Standards for More Recycled Content



A similar adjustment of the following standards will follow:

- EN 1401, PVC sewer pipes
- EN 1852, PP sewer pipes
- EN 14758, PP-MD sewer pipes
- EN 12666, PE sewer pipes
- EN 1453 PVC multilayer Soil & Waste pipes
- EN 1451 PP Soil & Waste pipes
- EN 1519, PE Soil & Waste pipes

## Standardization request, Mandate 584



### CPA: Standardization request, Mandate 584

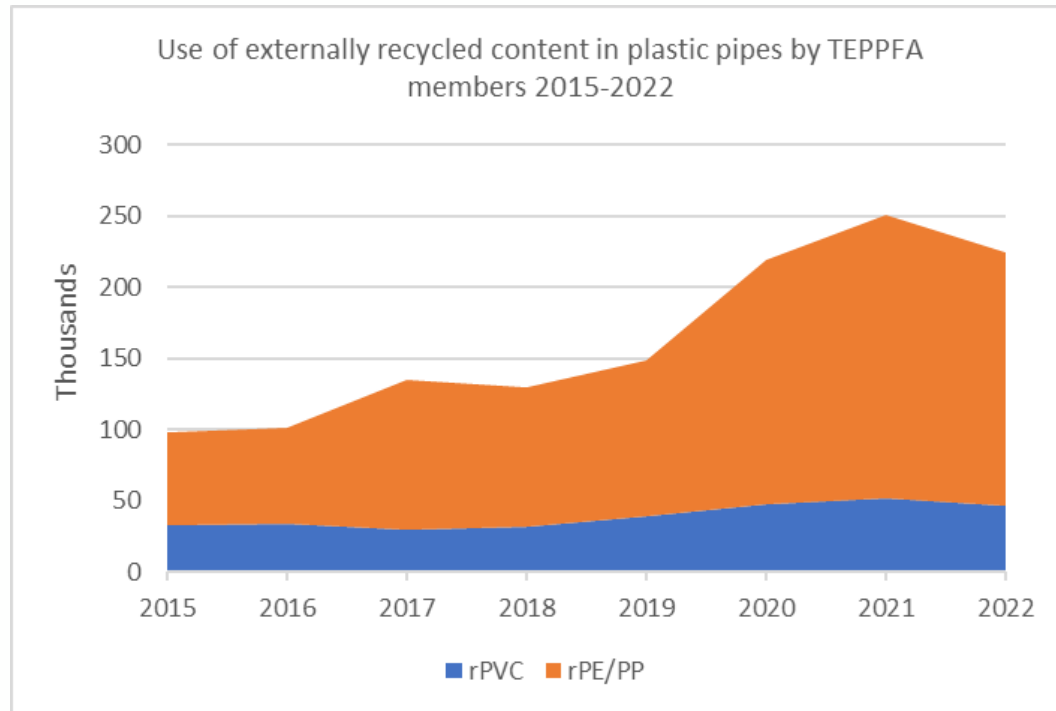
The standardisation request aims at 10 different product groups:

Reference information		Deadline for the adoption by the ESOs
4	European standardisation deliverables on design-for-recycling guidelines for plastic construction products: flooring products; EPS insulation products; polyvinyl chloride (PVC) cable management products; synthetic waterproofing and roofing membranes; PVC pipes and fittings; PE pipes and fittings; PVC profiles.	2 August 2025

- Peter Sejersen is appointed project leader for Design for Recycling in WG 25
- The document will be a CEN/TS
- We expect to finalise the work within the deadline of August 2025

## TEPPFA survey results 2022

### Uptake of pre- and postconsumer recycled content 2015-2022



## TEPPFA survey results 2022

### Definition Recycled Content (prEN14541-1:2021)

- Recycled content: “Proportion by mass of recyclate in a product”
- Recyclate: “Plastics material resulting from the recycling of pre-consumer and post-consumer plastic products”
- Own rework is excluded



### Plastic recycled content sources

- PVC: Pipes: 19%; Profiles: 10.8% Pipes and profiles: 70,2%.
- PE/PP: Pipes: 1.4%; Bottles: 7.6%; Other: 90.9%

### Chemical recycling of plastic pipe waste

Some materials used in pipes are difficult to mechanically recycle and reuse

- PEX
- Multilayer Pipes (MLP): plastic pipes with a metal or plastic barrier

### PEX waste: chemical recycling

- Gradual transition from lab scale to industrial processes
- Chemical recycling technologies are being developed by both major industry players such as LyondellBasell and smaller specialized companies.

## Conclusions

- EU Green Deal creates new regulations and opportunities
- New TEPPFA strategy ready to meet challenging new EU regulations
- Use of (mechanically) recycled content ahead of schedule, but volumes decrease due to challenging business environment
- Chemical recycling promises well for difficult to recycle pipe waste
- TEPPFA members well on track to enhance sustainability credentials

TEPPFA Aisbl

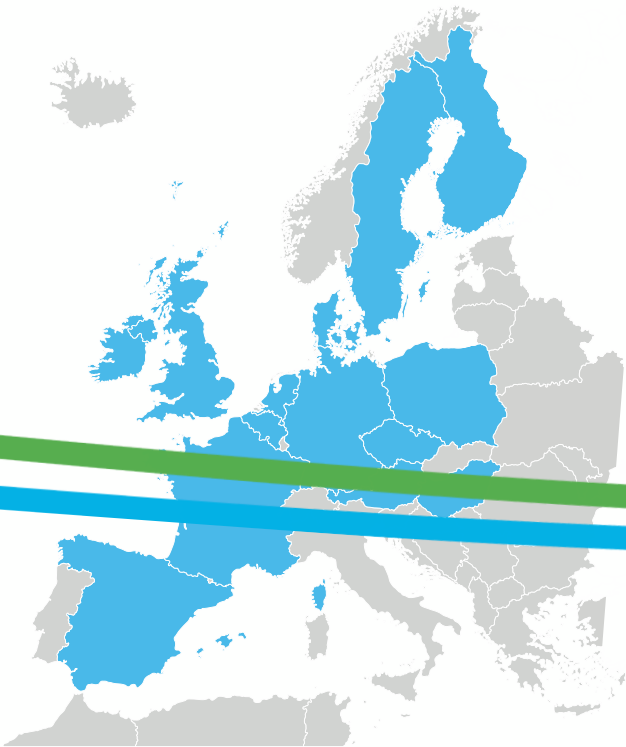
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# TEPPFA 2023



## Direct company members (14)



## Associated members



## Supporting members



## National Association members (15)



## Definitions to be consistent and credible to all stakeholders

