

Today's challenges!

Although recycling rate in Europe has increased during the last years, plastic recycling is nowadays limited by technological and non-technological **barriers** respect to landfill



As a result, landfilling is **still** one of the first options for post-consumer plastic waste treatment in most Member States!

The existing sorting and waste management system not able to separate plastics blends and composites

The heterogeneity of plastic hampers the mechanical recycling of these plastic materials

The lack of efficient and flexible valorisation technologies

Technological barriers



Non-technological barriers

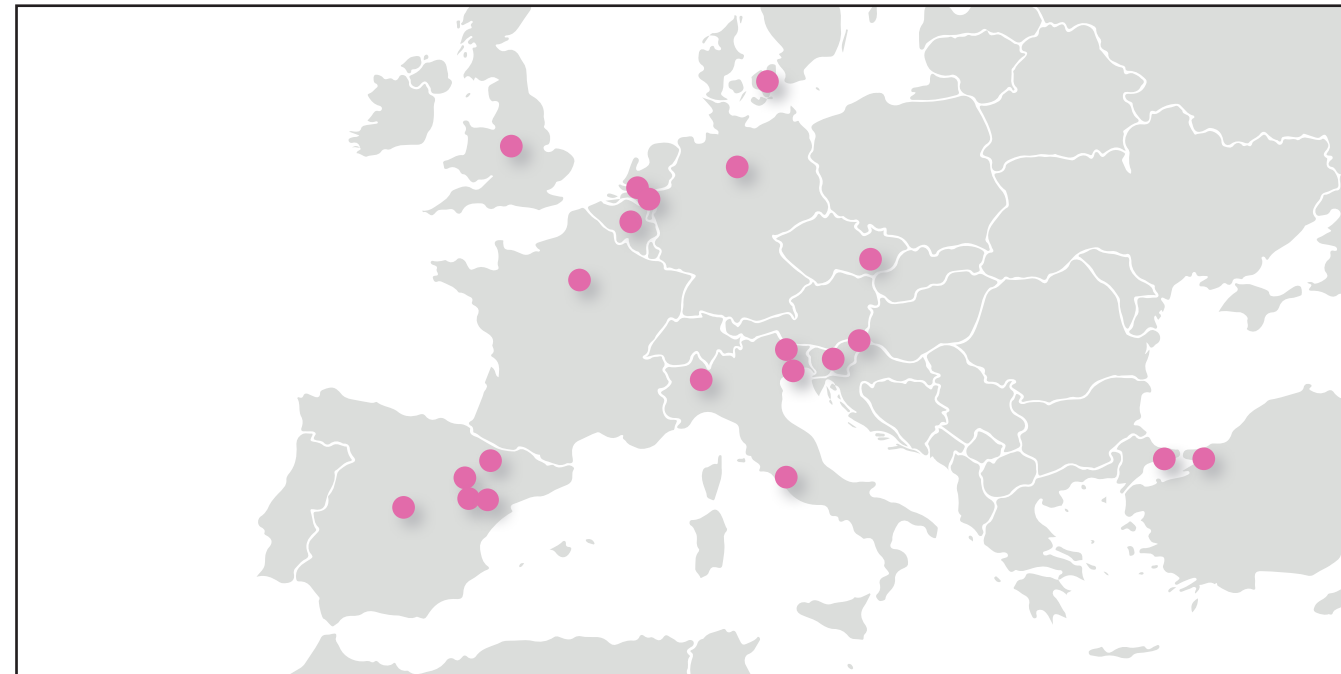
Plastic waste is generated at different points of the value chain

Existing standards are not homogeneous along Europe (e.g: Waste Directive and End of Waste Criteria)

feedstock

Recycling and redesigning the plastic value chain are essential aspects for reusing plastic waste material and avoiding landfilling

The polynSPIRE Consortium



Technology developers:		Standardisation / Dissemination:	
Chemical companies:		Plastic compounder:	
Equipment and steel manufacturers:		Plastic converter:	
		Waste manager:	

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polynSPIRE
 Innovative technologies for plastic recycling



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The polynSPIRE concept

polynSPIRE aims to demonstrate a set of **innovative**, **cost-effective** and **sustainable** solutions with an aim to improve the energy and resource efficiency of plastic recycling processes for materials containing at least 80% plastic.

The project is focused on plastic containing materials from **post-consumer** (after products' end of life) and **post-industrial** (produced during transformation processes from raw materials to final product).

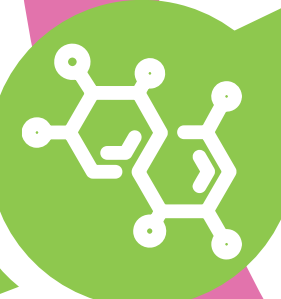
The project will address 100% waste containing streams ensuring the recycling of at least a **50%** of total plastics containing polyamides (**PA**) and polyurethanes (**PU**) leading to a reduction of CO₂



How?

Raw material alternative

Discover it!



Chemical recycling

Innovation A

- A.1 Chemical recycling assisted by **microwaves**
- A.2 Chemical recycling assisted by smart magnetic materials (**SMM**)

Innovation B

- B.1 Enhancing mechanical recycling using **vitrimers**
- B.2 Enhancing mechanical recycling using **compatibilizing additives**
- B.3 Enhancing mechanical recycling via **high energy radiation**

Mechanical recycling with advanced techniques

Innovation C

Valorisation of low-grade plastic wastes by using them as carbon source and foaming agent in the **steel sector**

Valorisation



polynSPIRE direct impacts!

60kt plastic waste recycled/reused
300kt CO₂ equivalent reduced
70kt oil-equivalent fossil resources saved

and 20 years from now...

>4.5Mt/year of residues treated
>45Mt CO₂ equivalent/year reduced
>10Mt oil-equivalent/year of fossil resources saved

*our brochure finishes here, but our mission doesn't!
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