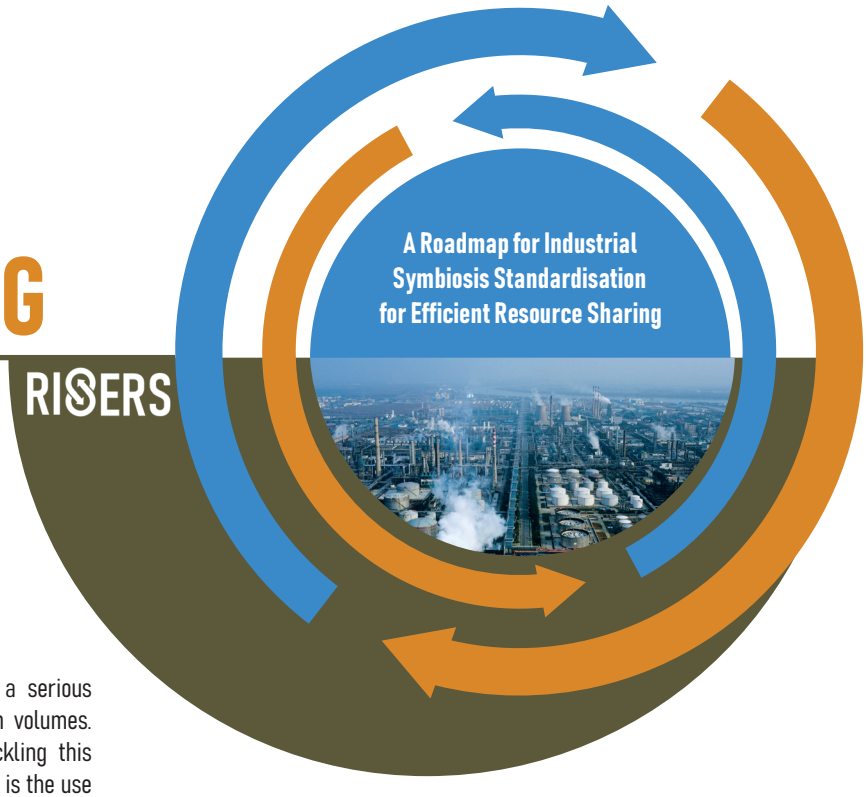
Synergy Fact Sheet

PLASTIC PACKAGING



Use plastic waste as alternative resource/fuel in industrial processes like cement kilns or recycle plastics as a substrate for new materials production

Introduction

Plastic waste from packaging, especially single-use plastics, poses a serious environmental problem due to its durability and increasing production volumes. Developing effective recycling and reuse strategies is crucial to tackling this challenge and promoting sustainable practices. One innovative approach is the use of plastic waste in industrial applications, such as in the minerals sector, where it can serve as a valuable alternative material (Torkelis, Dvarionienė, & Denafas, 2024). Modern recycling techniques, including chemical processes such as gasification and incineration, offer efficient ways to convert lightweight plastic packaging waste into useful materials. These methods not only reduce dependence on landfill disposal, but also offer environmental and economic benefits through the recovery of materials that can be reused in industrial production (Voss, Lee, & Fröhling, 2022, AIDRES, 2023). Material flow analysis (MFA) is an important tool for designing sustainable waste management systems. By mapping how plastic waste moves through and accumulates in the system, MFA helps industries such as the minerals sector to efficiently incorporate these waste streams into their processes (Choi, Hwang, Yoon, Jeon, & Rhee, 2024). The use of plastic packaging waste in sectors such as the minerals industry supports waste reduction while contributing to the principles of a circular economy. This approach transforms waste into a resource and offers practical and sustainable solutions to the global plastic waste challenge.

Gradual replacement of fossil-based plastics by recycled or sustainably sourced feedstock is aimed to reach 65% by 2050 (Plastics Europe, 2024)

Supplying sector(s)

Various — Various

Receiving sector(s)

Various, Cement — Cement, Various

TECHNICAL FEASIBILITY

The industrial-scale recycling of plastic packaging waste is adaptable to large-scale operations, supporting the high-volume processing required for industrial applications

High technical requirements: Advanced technologies, such as chemical recycling including gasification and incineration-based processes are necessary to efficiently convert plastic waste into usable materials for industrial sectors, such as mineral processing

PPP IMPACT – EU wide potential

Profit

Wins in industry

The reuse of plastic packaging waste brings economic benefits as fewer new raw materials are required and the efficiency of industrial processes is improved. The 16.1 Mt of plastic packaging waste was produced in 2021, of which 6.56 Mt was recycled (Eurostat database).

Planet

Environmental gains

Recycling plastic waste helps reduce the amount of material sent to landfill, reducing pollution and greenhouse gas emissions. According to the EU Plastic Packaging Waste (PPW) regulation, a 55% recycling target is set for 2030, with an ambition to achieve approximately 65% recycled content in plastic packaging by 2040.

People

Wins for society

Modern recycling technologies create new jobs, boost local economies and contribute to wider sustainability goals.

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About this factsheet

This fact sheet is based on the findings of the RISERS project. Led by Ghent University with the support of project partners, the study involved a systematic assessment of 600+ industrial symbiosis (IS) cases across urban-industrial and cross-sectoral clusters in Europe. These cases formed the basis for the mapping of over 300 MES (Materials, Energies, Services) streams, categorised by output (source) and input (sink) sectors.

The fact sheet provides a detailed overview of a high-potential and high-impact IS synergy, evaluating its implementation feasibility and sustainability impact. Supported by data from public databases (MAESTRI, SCALER, EPOS, AIDRES, etc.) and literature, it offers a generalised insight into the economic, environmental, and social benefits per synergy.

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About the RISERS project

RISERS is a Horizon Europe project aimed at developing an Industrial Symbiosis Standardisation Roadmap supporting the uptake of high impact synergies and resources considering:

- identification of the needs, gaps and opportunities,
- revision of current standards and standardisation efforts relevant for CE and the priority synergies and resources,
- initiating the process of new standards development (especially for newer technologies and pilot-scale synergies).

The RISERS project was launched in January 2024 with a duration of 3 years.

For more information visit: https://risers-project.eu

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