

Cement co-processing is a sustainable solution for recycling end-of-life composite materials



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# Introduction of the industry associations



# Introduction of the industry associations



**Glass Fibre Europe:** Founded in 1987, is the voice of the European continuous filament glass fibre industry. The continuous filament glass fibre industry is the cornerstone of the glass-based composite materials and technical textiles value-chains. [www.glassfibreeurope.eu](http://www.glassfibreeurope.eu)



**EBI,** the European Boat Industry represents the recreational boating and nautical tourism industry in Europe. It encompasses all related sectors, such as manufacturing, services, infrastructure and tourism. [www.europeanboatingindustry.eu](http://www.europeanboatingindustry.eu)



**CEMBUREAU,** the European Cement Association is the representative organization of the cement industry in Europe. Currently, its Full Members are 23 national cement industry associations and cement companies of the European Union plus Norway, Switzerland and the UK. [www.cembureau.eu](http://www.cembureau.eu)



**WindEurope** is the voice of the wind industry representing over 500 organizations from across the whole value chain of wind energy. [www.windeurope.org](http://www.windeurope.org)



**EuCia,** the European Composites Industry Association is composed by European national composites associations and industry-sector groups. 10,000 companies and 150,000 employees. [www.eucia.eu](http://www.eucia.eu)



**UP/VE** The UPR/VE Resin Association, a Cefic Sector group, represents unsaturated polyester (UPR) and Vinyl Ester (VE) resins producers of Europe. [www.upresins.org](http://www.upresins.org)



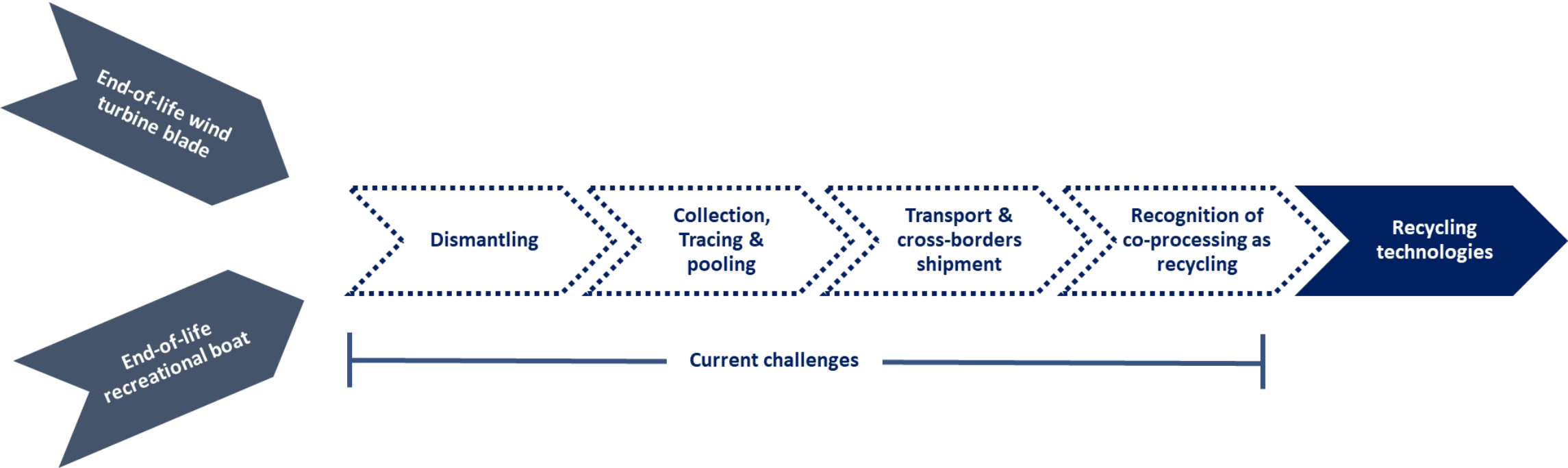
**EPOXY EUROPE,** a Cefic sector group, represents the interests of the major European epoxy resins manufacturers since the early 1980s. [www.epoxy-europe.eu](http://www.epoxy-europe.eu)



**Cefic,** the European Chemical Industry Council, was founded in 1972, and is the voice of large, medium and small chemical companies across Europe, which provide 1.2 million jobs and account for 16% of world chemicals production. [www.cefic.org](http://www.cefic.org)

# Why are we here?

## Challenges on the way to industrial-scale recycling



# Composite materials are essential contributors to the green deal objectives



# About composite materials



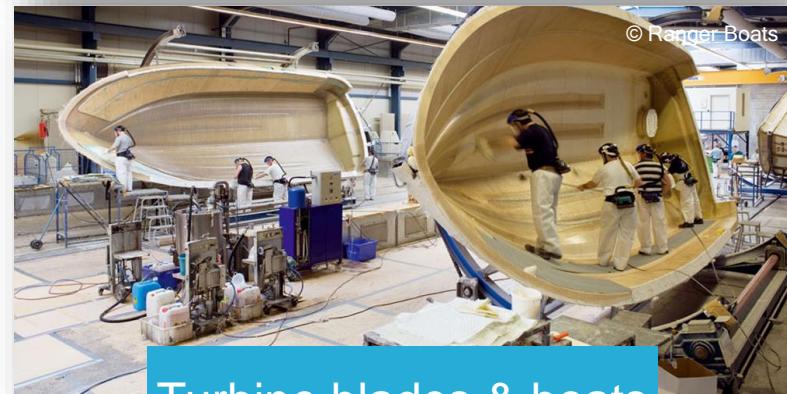
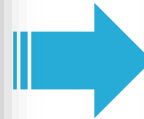
Polymer matrix



Core

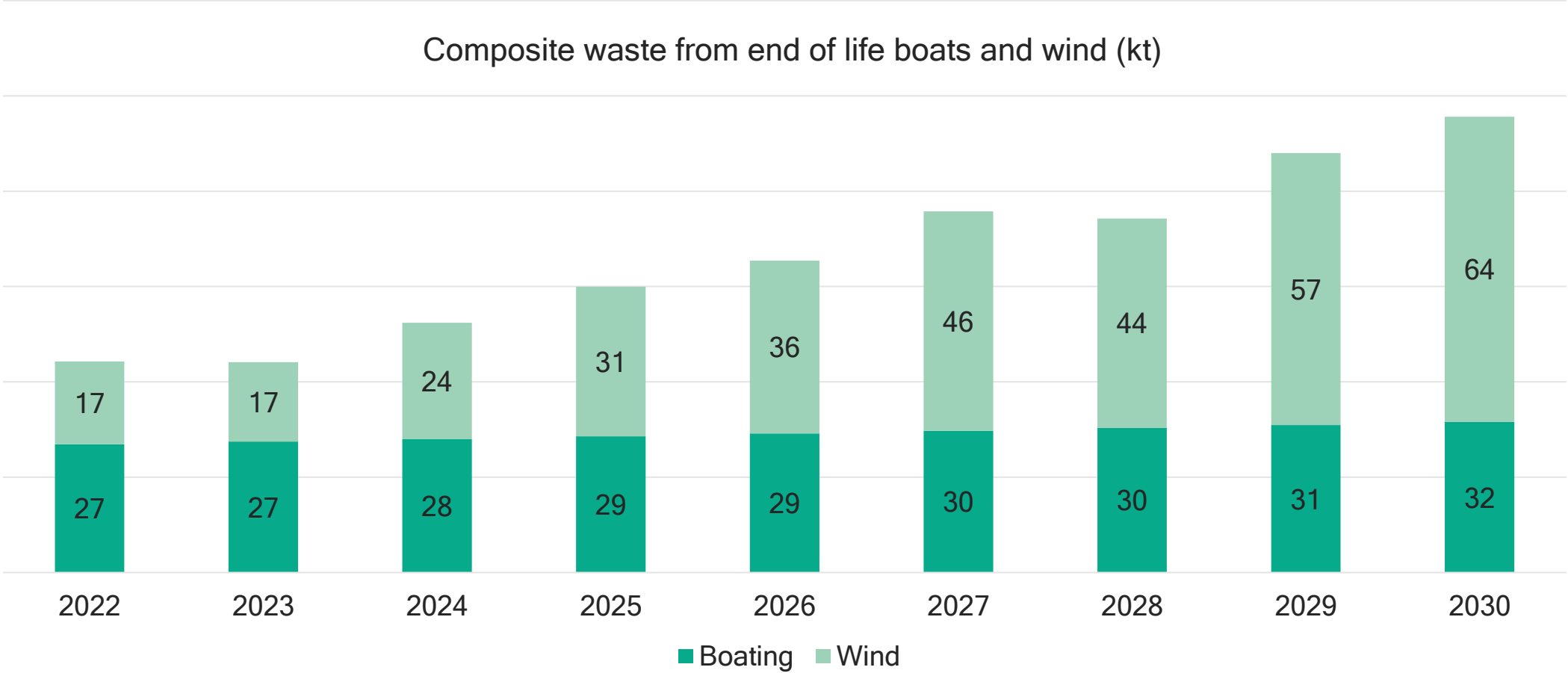


Reinforcement



Turbine blades & boats

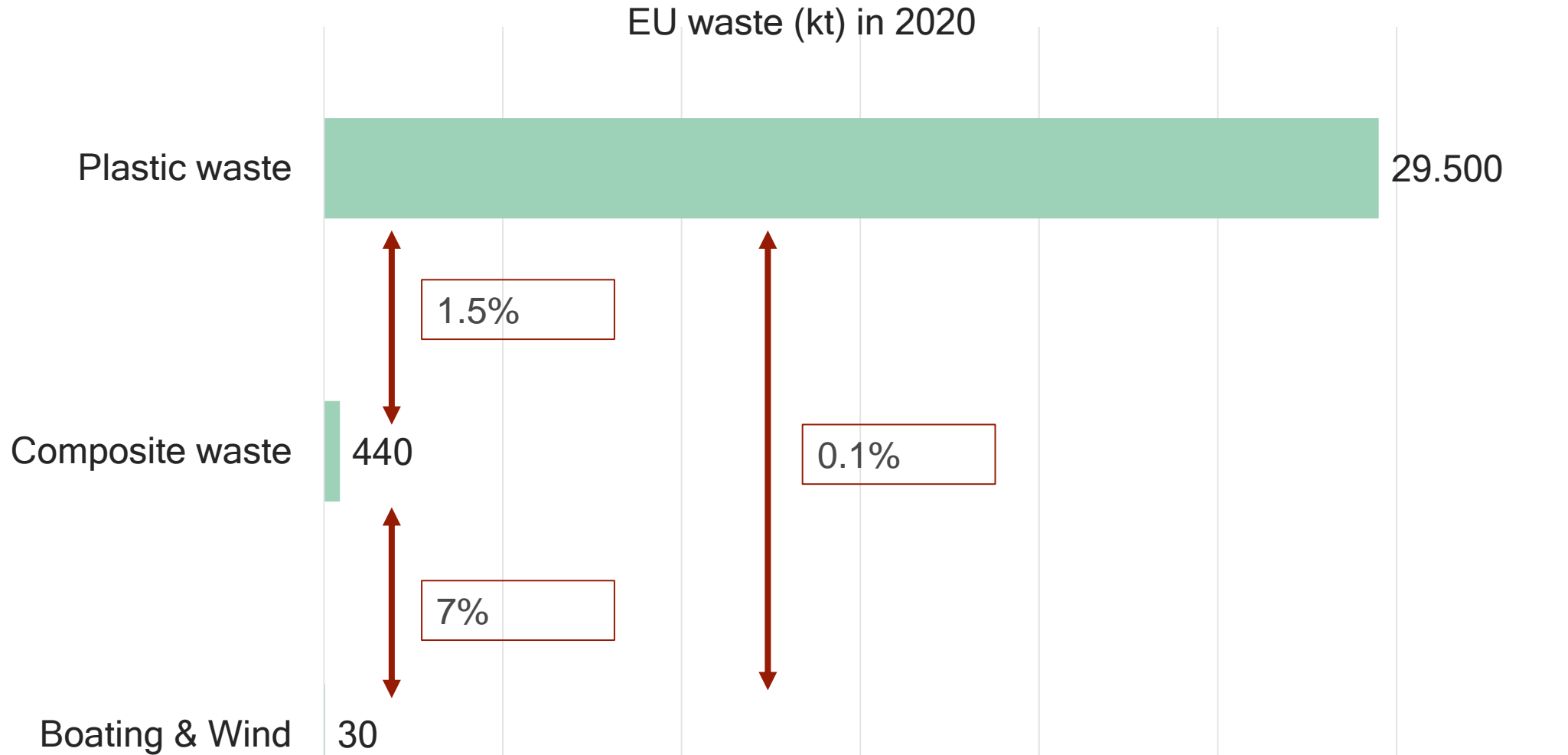
# Waste from end-of-life composites is growing



Sources: EBI, WindEurope

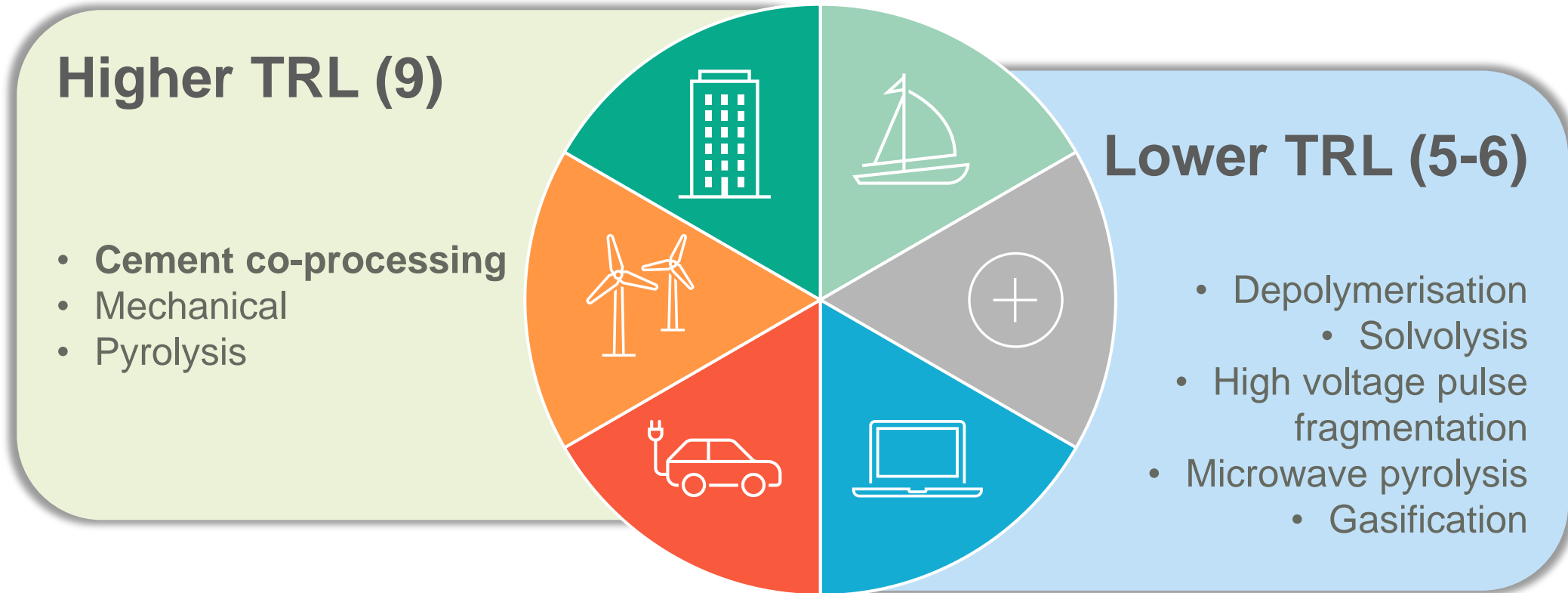


# Small volumes, serious ambitions & proactive approach



Sources: EBI, EuCIA, PlasticsEurope, WindEurope

# Technologies are brought to maturity



Cement co-processing paves the way for other technologies

# Cement co-processing is commercially and technically proven for treating end-of-life glass reinforced composite materials

Benefits of material recycling:

- **Benefit of re-using materials** :Reducing the use of natural raw materials in cement manufacturing
- **Energy recovery** :Mitigating climate change contributions through replacement of fossil energy sources (pet coke, coal, lignite)

Ultimately reducing required energy and CO<sub>2</sub> emissions in cement manufacturing process\*

**70%**

recycling raw material (glass fibre and mineral filler)

**30%**

energy recovery resins



\* A Life Cycle Analysis to better quantify energy and CO<sub>2</sub> reductions is in preparation, ready by end of 2023

# Recycling Glass Reinforced Composites: Finland

- Originally government sponsored supply chain collaboration in 2021-2022 (“KiMuRa”)
- Now in full commercial operation for: boats, construction profiles, wind turbine blades
- Collection throughout Finland by Kuusakoski, recycling into cement through Finnsementti



# Recycling Glass Reinforced Composites: Germany

- Collection and cement co-processing for 10+ years at Neowa / Holcim
  - Processing ~10-15 kT/yr of composite waste
- New set-up at Roth International in commissioning phase
  - Capacity 20+ kT/yr



# Recognize cement co-processing as a Recycling Process



- **Waste Framework Directive 2018/851/EC**

Article 11(7): “[...] The Commission shall assess co-processing technology that allows the incorporation of minerals in the co- incineration process of municipal waste. Where a reliable methodology can be found, as part of this review, the Commission shall consider whether such minerals may be counted towards recycling targets.”

- **New ISO standard - early 2024**

*“Determination of the **Recycling Index for co-processing**”*

ISO Technical Committee 300 / Solid Recovered Fuels (SRF) / ISO CD 4349



# Five steps to unlock industrial-scale recycling

- **Revise the List of Waste** to create dedicated waste codes for composite material waste from decommissioned wind turbine rotor blades and boats.
- **Revise the Waste Framework Directive** to set progressive targets for the reuse and recycling of composite material waste from decommissioned wind turbine rotor blades and boats
- **Develop an EU-wide model for separate waste collection** of composite material waste from decommissioned wind turbine rotor blades and boats.
- **Revise the Landfill Directive** to set a landfill ban on composite material waste from decommissioned wind turbine rotor blades and boats
- **Revise the Waste Shipment Regulation** ensure composite material waste from decommissioned wind turbine rotor blades and boats is subject to the Green control procedure of the Basel Convention.

# Thank you

Cement co-processing | Sep 29, 2023

