

Achieving Circularity for PET Thermoforms: an insurmountable challenge?

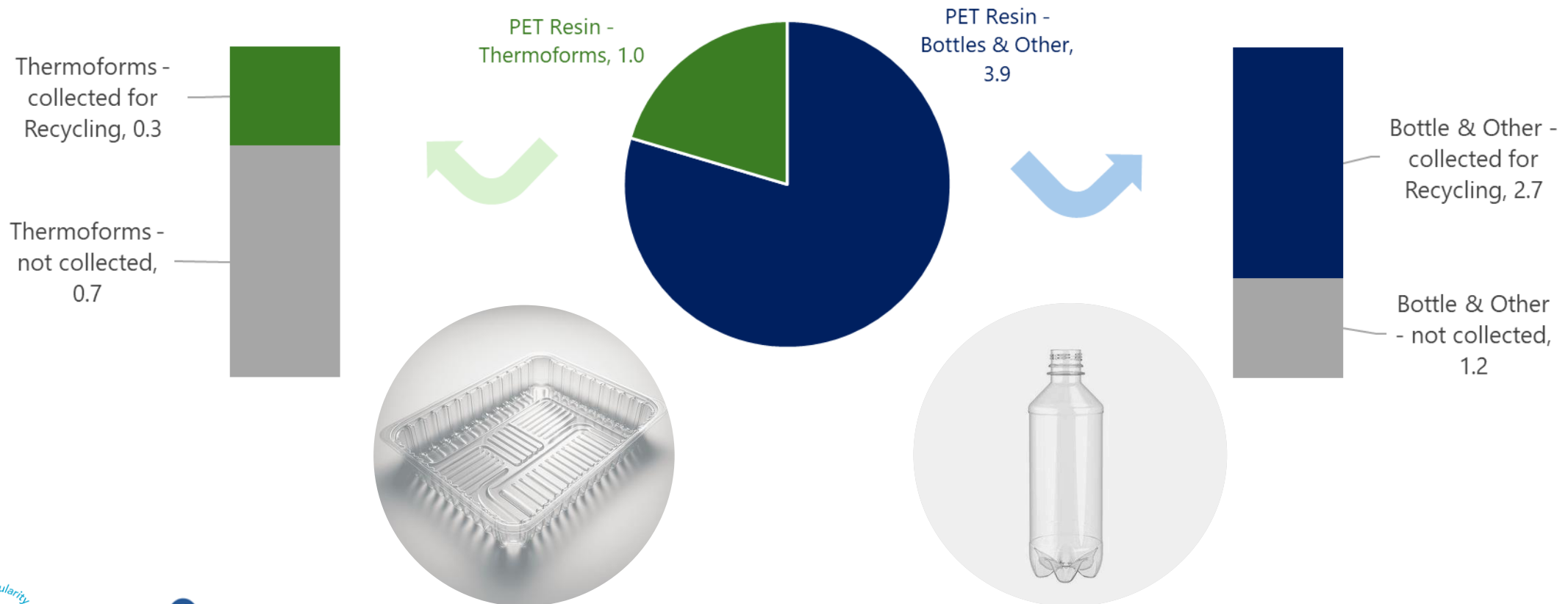


Dr. Matthew Clough
Argus Media, London, UK

PETCORE Thermoforms, 27 May 2025

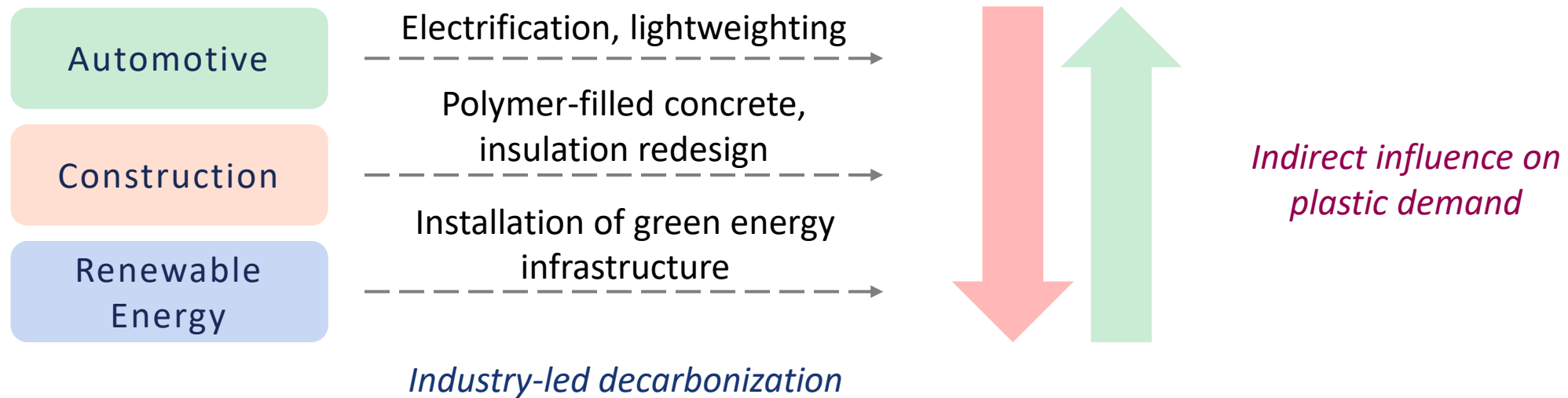
Thermoforms are a major component of Europe's PET demand

The **collecting** stage acts as a major bottleneck for “closing the loop” on PET thermoforms.



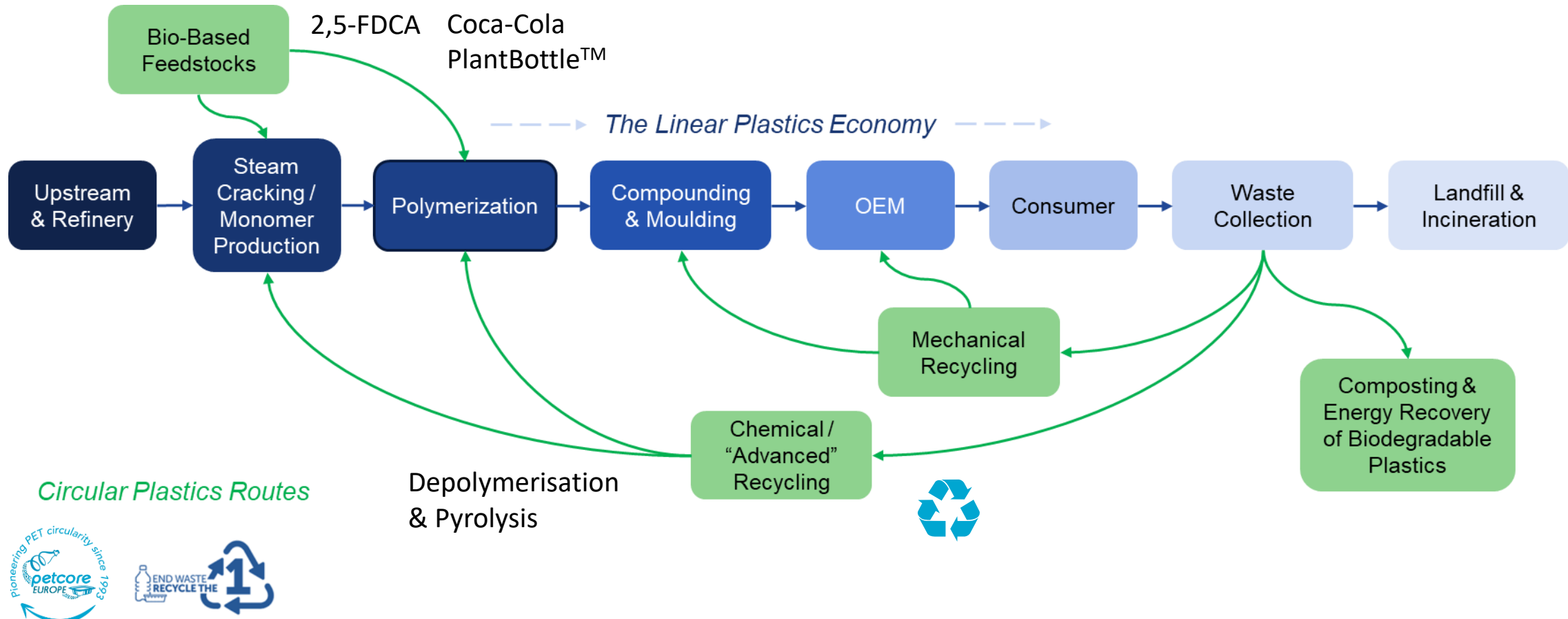
Like other commodity plastics, PET plays an overlooked role in material transition

Overall demand for PET in Europe will remain buoyant in Europe, with a positive impact of “material transition”.



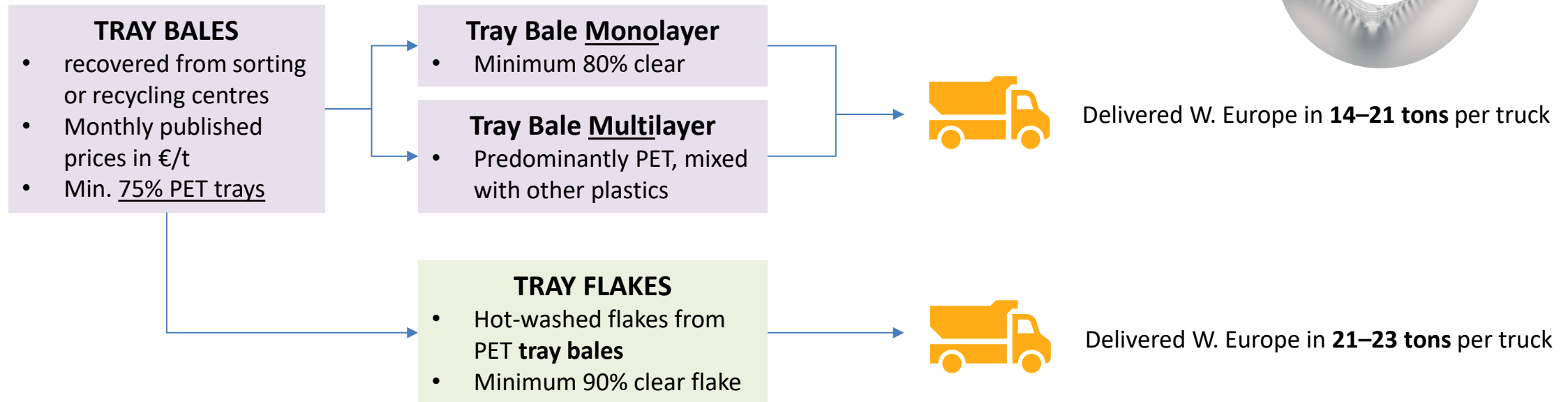
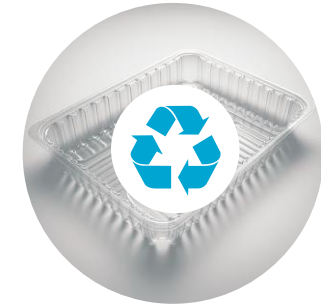
PET is the archetype of the circular plastic economy, ...

PET – and its analogues – have been at the **forefront of plastic circularity**, including recycling and bio-based synthesis.



... with recycled PET comprising half of thermoform production

A steadily growing number of players are operating in **Europe's tray-to-tray PET market**.

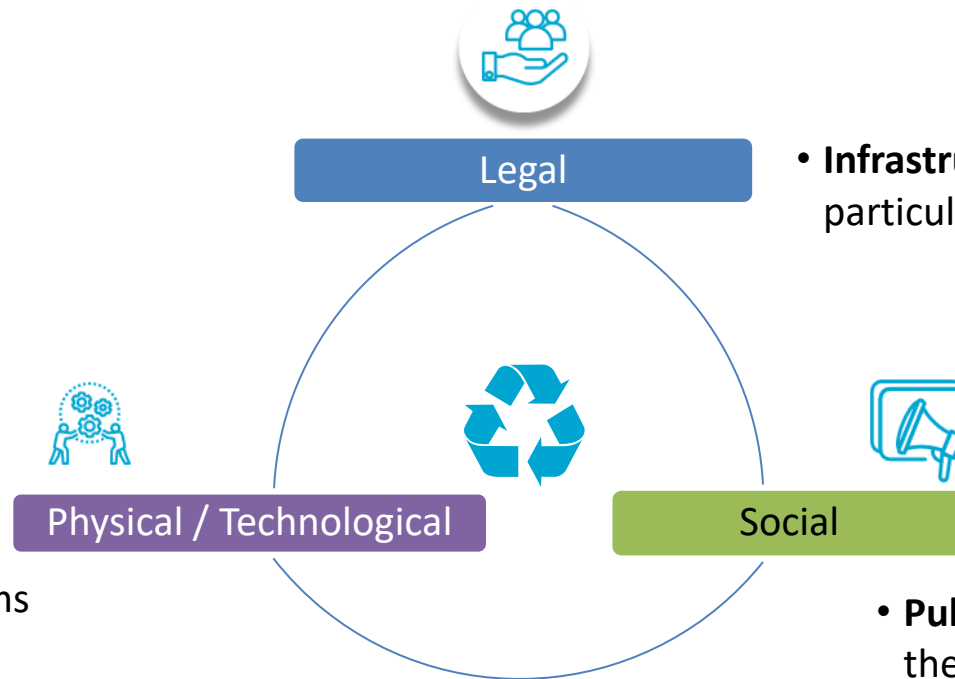


Thermoforms living in a bottle world?

Challenges facing recycling of thermoforms

(At least) **three types of challenge** restrict circularity of PET thermoforms.

- Single-layer and brittle thermoforms force a **modification to the recycling technology** or mandate an **additional sorting step**.
- **Contamination** in thermoforms – food, adhesive, label, etc. – hinders recycling to food contact trays.



- **Infrastructure for recycling of trays** – particularly as a *separate* stream – is lacking.

- **Public perception** of the recyclability of thermoforms lags behind that of bottles.

Legislation and the prospect for PET thermoforms

Plastic Packaging Waste Regulation (PPWR) is the most upfront and immediate directive influencing PET thermoforms.



Plastic Packaging Waste Regulation

- Mandatory levels of recycling content in plastic packaging, with key targets in 2030 and 2040
- 30% recycled content for contact sensitive packaging and 35% for non-contact sensitive packaging by 2030



Waste Shipment Regulation

- Bans on plastic exports to non-OECD countries from November 2026 for 30 months*
- To impact 6% of PP waste exports and 10% of PE waste.



EU Emission Trading System

- Cap on CO₂ emissions
- Municipal waste incinerators proposal
- Free allowances are decreasing in line with CBAM requirements



EU Landfill Directive

- Bans landfilling recyclable plastic
- Aims to send less than 10% of municipal waste in member states going to landfills by 2035.

* Some non-OECD countries applied to continue importing plastic waste and if approved imports could resume after 1st May 2029.

Can *chemical* recycling assist in the recycling of PET thermoforms?

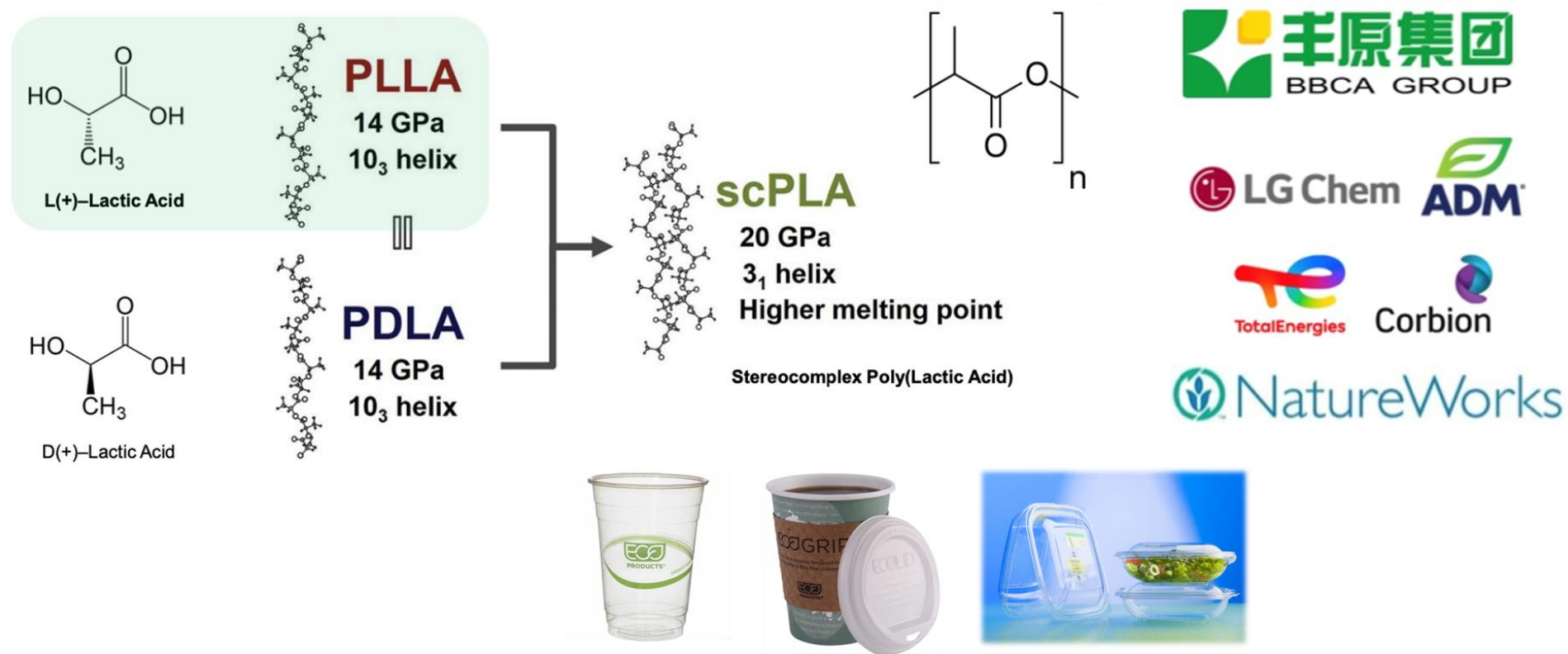
30+ chemical recycling ventures exist in Europe, but are beset by **delays, feedstock constraints, and scalability problems**

	Company	Location	Capacity (t/yr)	Status
	Eastman	Port Jerome, FR	100,000 (phase 1) to 200,000	Intent to proceed, with pause to await customer contracts
	Ioniqa	Geleen, NL	10,000	Filed for bankruptcy protection (Oct '24), but restarted Dec '24?
	Carbios/Indorama	Longlaville, FR	50,000	Funding and construction delays start from 2025 to 2027
	Axens/Toray Films	Saint-Maurice-de-Beynost, FR	30,000 (phase 1)	Construction scheduled to begin in 2025 and start-up 2027
	Gr3n/Intecsa	Spain	40-50,000	Receipt of €35mn in EU funding for project (Oct '24) - start-up in 2027?
	DePoly	Monthey, CH	500	Plant to launch in summer 2025 and announced \$23mn secured to build a commercial-scale plant in 2027



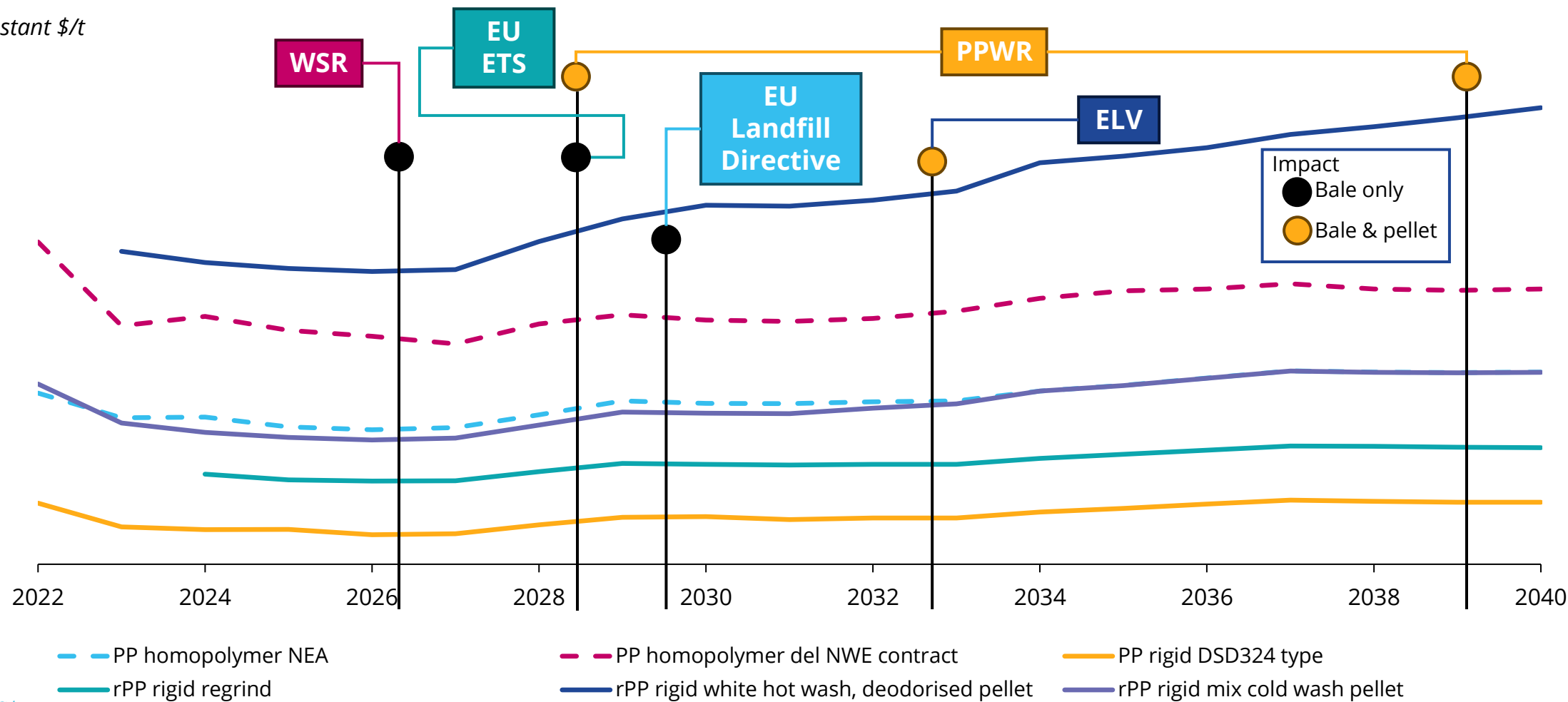
Emerging Materials: do PET thermoforms face a substitution risk?

Biodegradable alternatives to PET – such as polylactic acid (PLA) – are a new but noticeable phenomenon.



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