Mechanical & Advanced Recycling: Translating *Policy* to *Price Projection*

Go Circular 2026 – Mannheim, Germany

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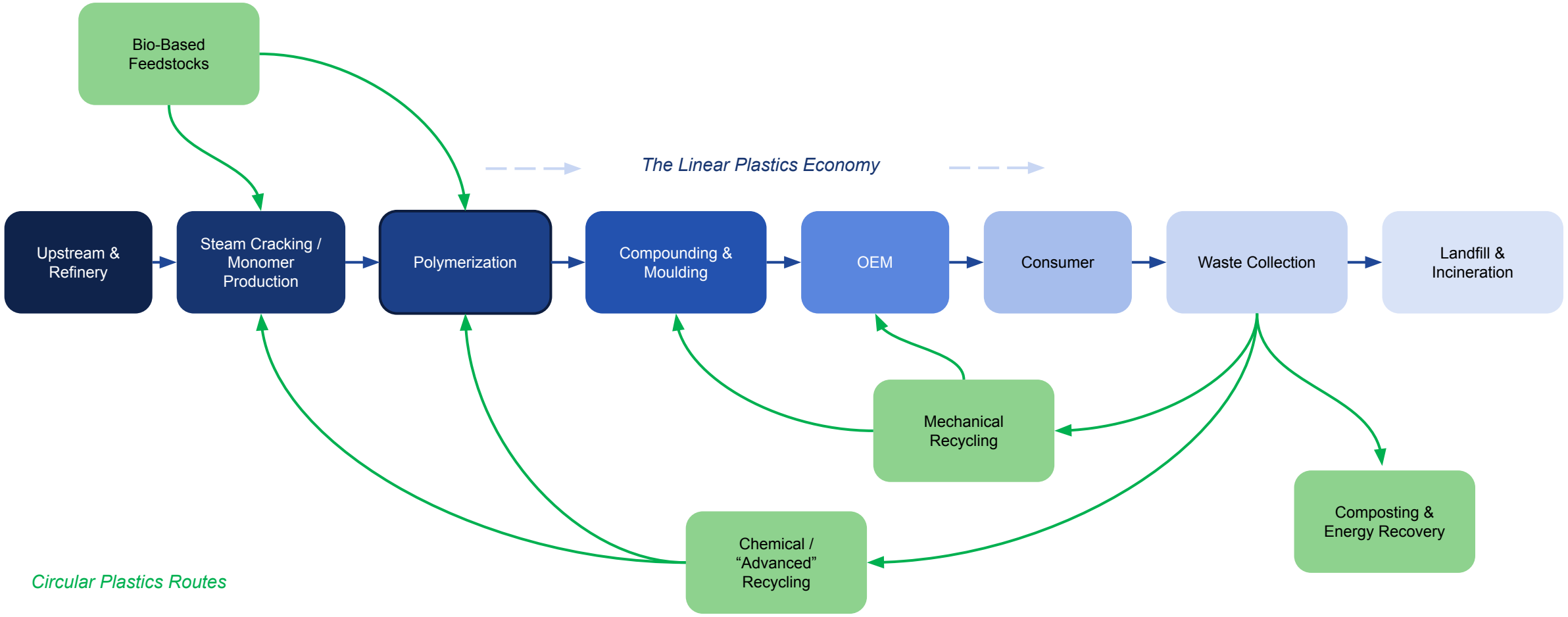
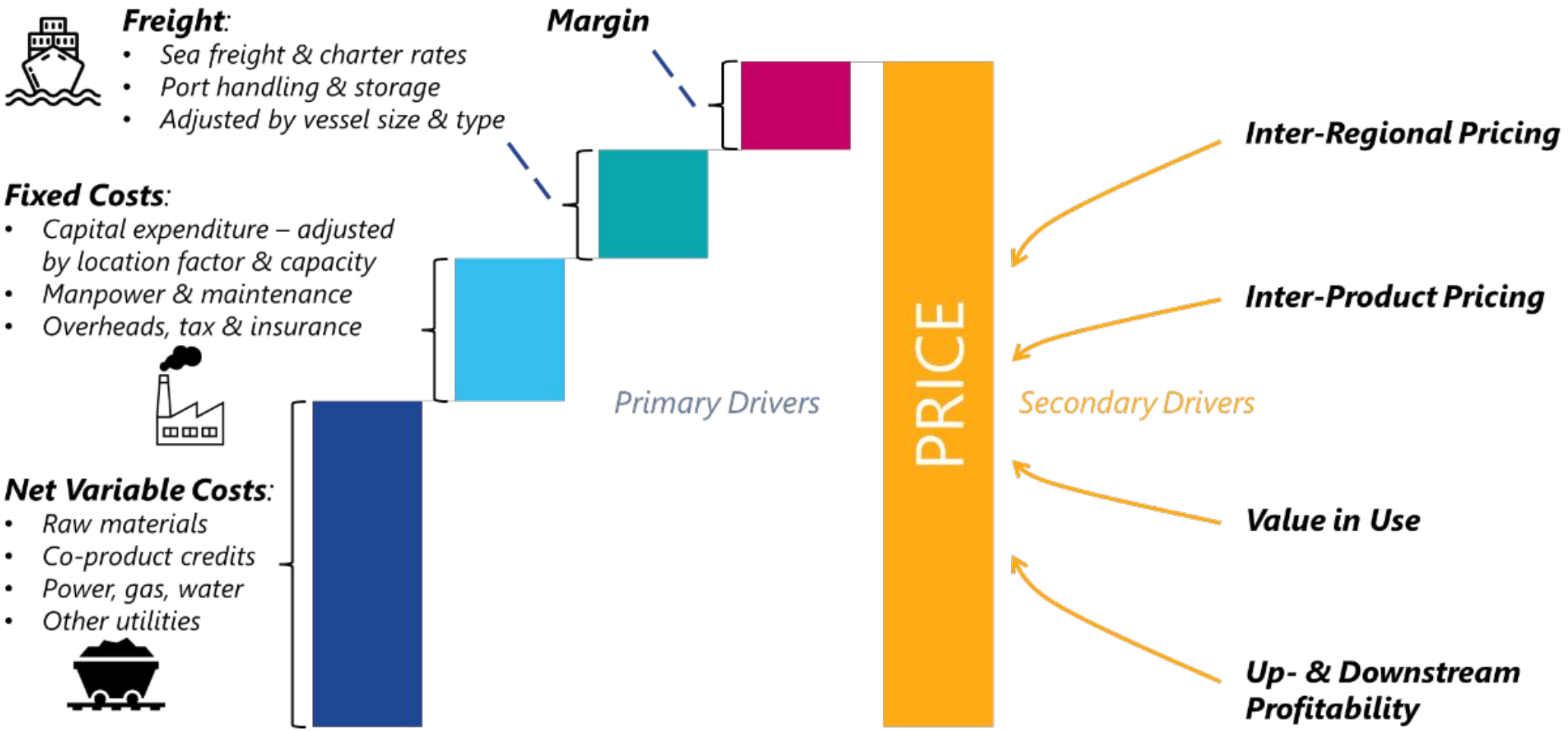
Accurate price forecasting is a key tool for viability of the circular plastic economy



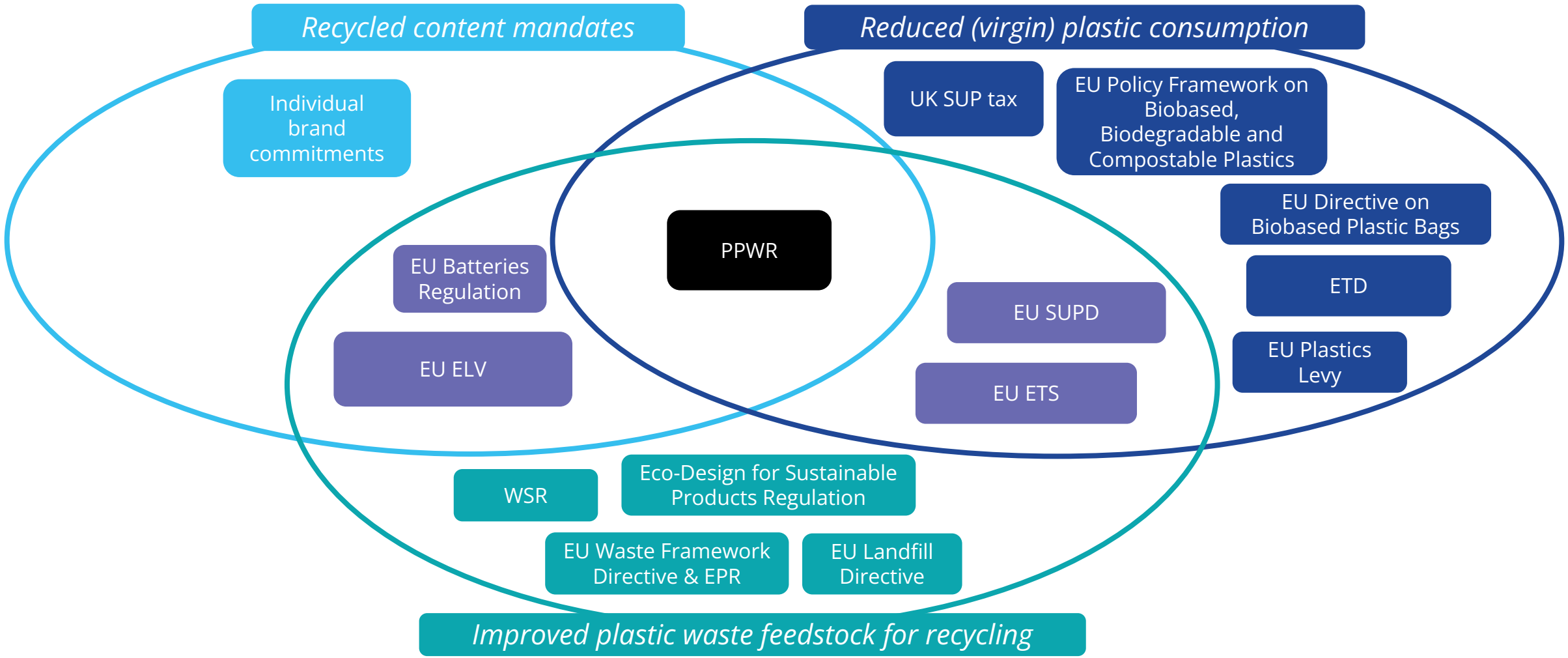
Source: Argus Media - Consulting Services

Virgin *and* recycled prices – plus the correlation– are affected by underlying costs



Source: Argus Media - Consulting Services

Recycled polymer prices are suppressed or buoyed by numerous pieces of legislation



Source: Argus Media - Consulting Services

Some *directly* mandate for recycled content, whilst others *indirectly* influence demand

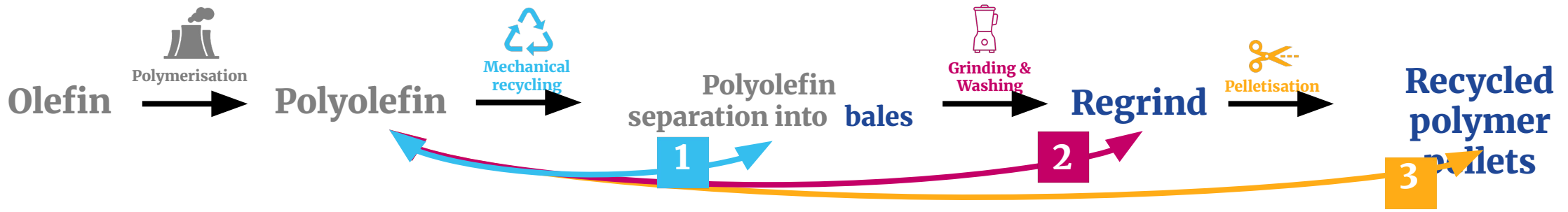
Argus is viewing the following to have the most significant effect on Europe's recycled plastic landscape

PPWR	ELV	WSR	EU ETS	EU Landfill Directive
▪ Mandatory levels of recycling content in plastic packaging, ▪ Key targets in 2030 and 2040	▪ Plastic used in vehicles to come from recycling, as well as some sourced from ELVs ▪ Promotes closed-loop automotive recycling ▪ Stricter rules on ELV exports	▪ Bans on plastic exports to non-OECD countries from November 2026 for 30 months ▪ To impact 11% of PP waste exports and 10% of PE waste.	▪ Cap on CO_2 emissions ▪ **Municipal waste incinerators** proposal ▪ Free allowances are decreasing in line with CBAM requirements	▪ Bans landfilling recyclable plastic ▪ Aims to send less than 10% of municipal waste in member states going to landfills by 2035.
↑ Demand for mechanical & chemical recycling	↑ Demand for recyc. plastic in automotive sector	↑ Supply of plastic waste available in the EU and OECD countries	↑ Supply of plastic waste available that will stop being incinerated	↑ Supply of recyclable plastic waste available that will stop being landfilled
↑ Indirectly *support* for EU recycling infrastructure	↑ Indirectly *support* for EU recycling infrastructure	↑ Indirectly *support* for EU recycling infrastructure	↑ Cost of virgin plastic; large units surrender credits for CO_2 emissions	
↓ Virgin polyolefins demand	↑ Supply of ELV material for recycling in the EU		↓ Virgin polyolefins demand	
	↓ Virgin polyolefins demand			

Source: Argus Media - Consulting Services

Historic price analysis reveals the relationship between virgin and recycled prices

1. *Establish relationship between prices of virgin polymer and recycled material :*



- Run regression analysis to establish which of the 1,2 or 3 prices and virgin polymers move simultaneously.

2. *Correlation analysis*

- Factors between 0.5 and 0.8 (positive) or -0.5 and -0.8 (negative) □ **meaningful**
- Factors between 0.8 and 1.0 (positive) or -0.8 and -1.0 (negative) □ **strong**

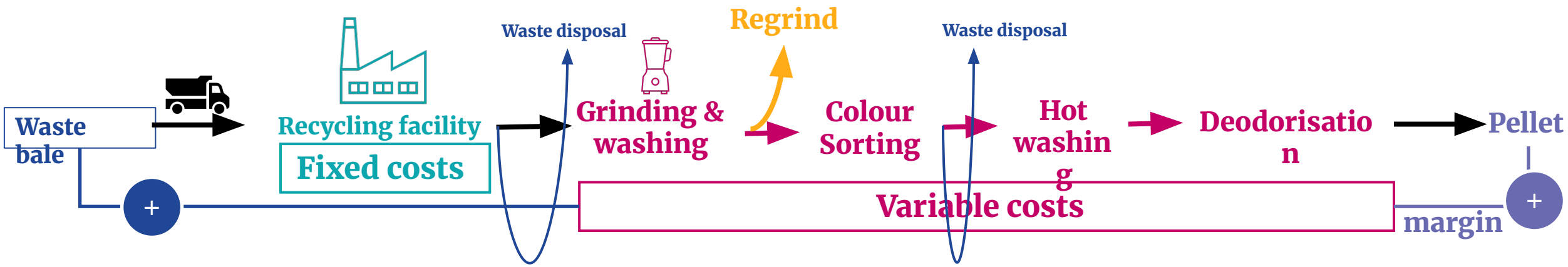
Correl.	PP 1	PP 2	HDPE 1	LDPE	LLDPE	...
rPP 1	0.8					
rPP 2	0.6	0.8				
rHDPE			0.8			
rLDPE				0.8		
...						

3. *Factor in regulatory impact ...*

Source: Argus Media - Consulting Services

Reverse engineering of cost-plus-margin allows for the prediction of bale/regrind price

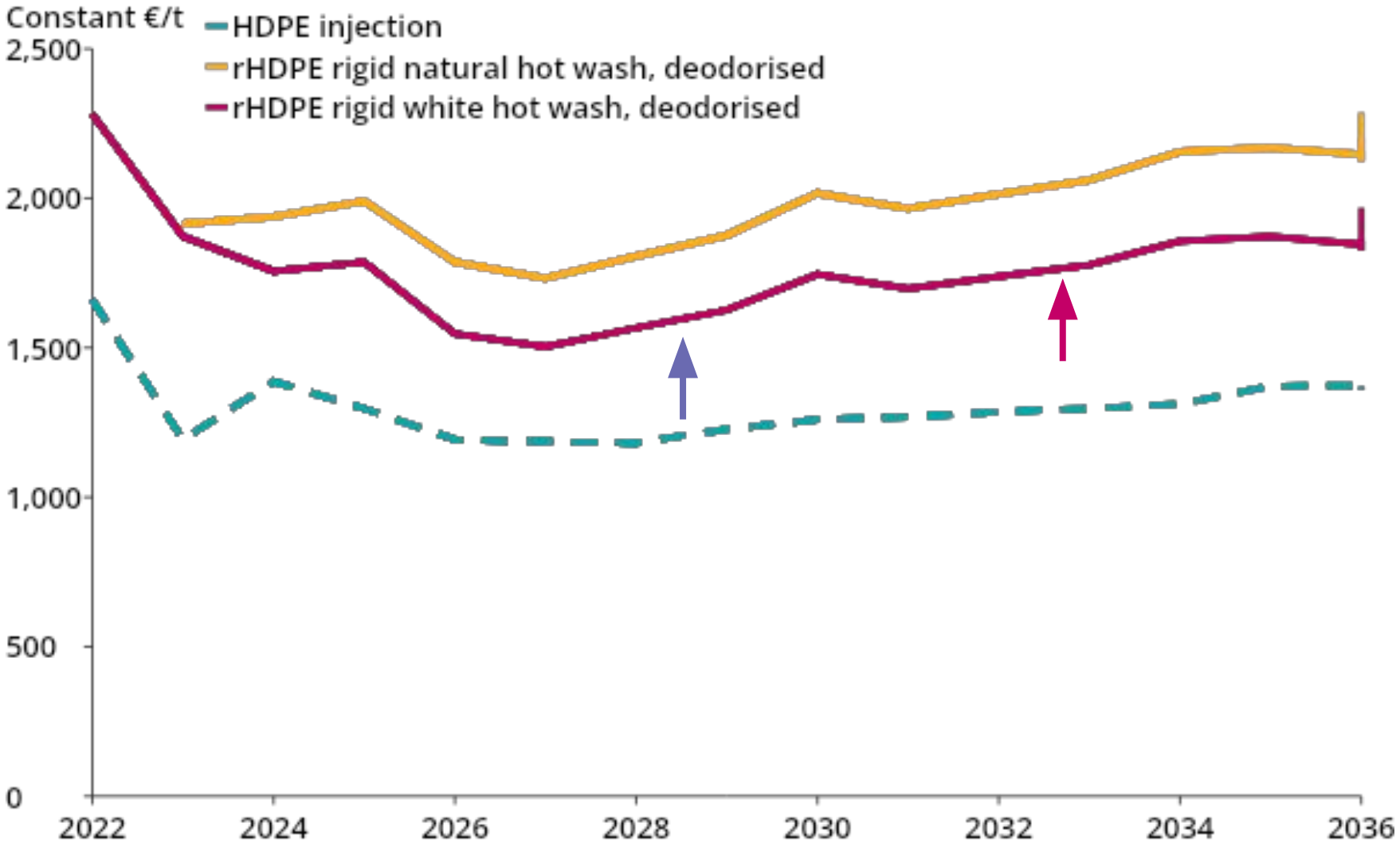
From the **pellets**, the price of **regrind** and of the waste **bale** can be calculated by "inverse cost-plus-margin", starting from the product (**pellet**) and subtracting the total cash cost and margin.



Source: Argus Media - Consulting Services

rHDPE rigid natural hot wash, deodorised

PPWR and ELV to widen rHDPE and HDPE gap



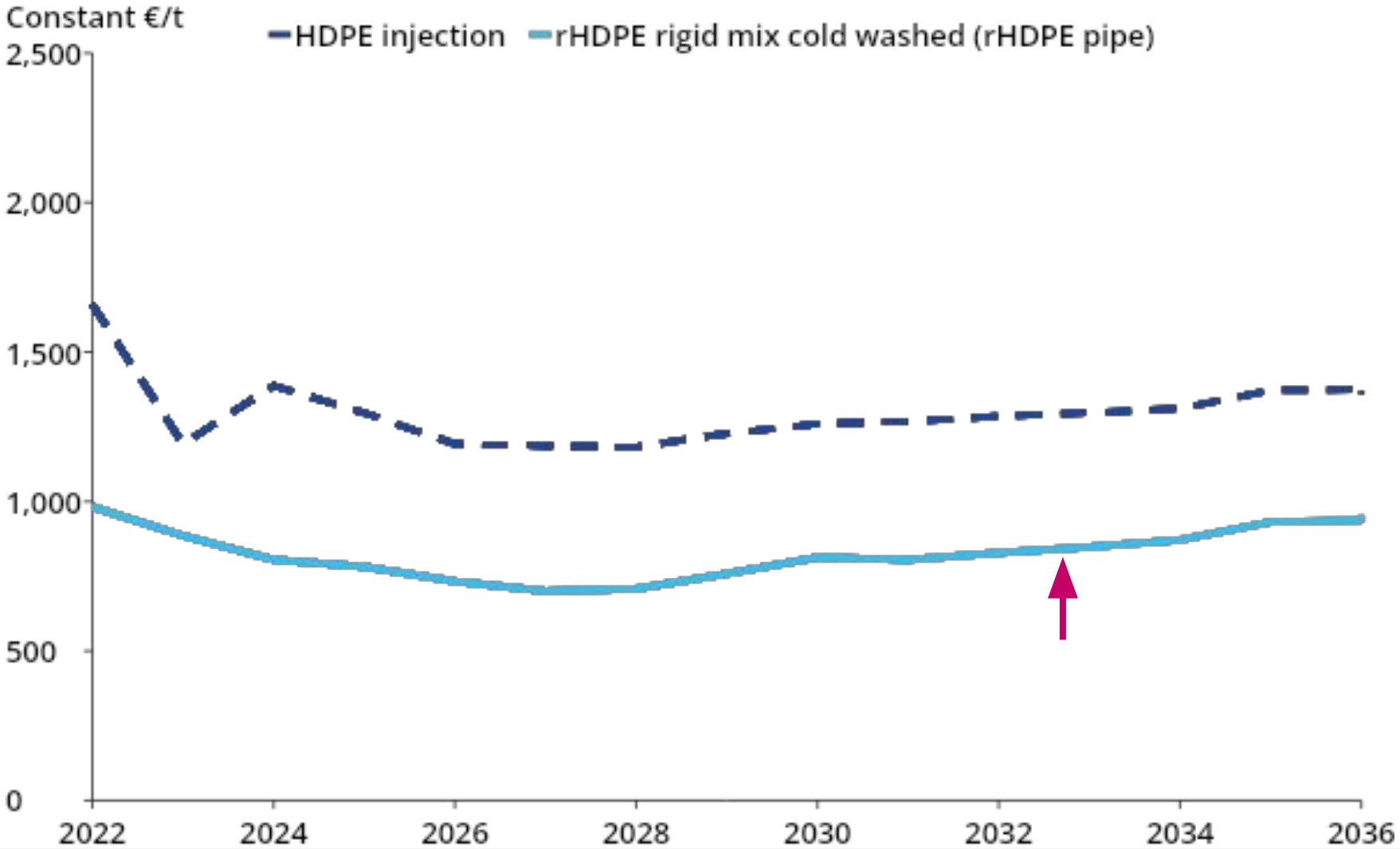
Legend
PPWR
ELV

- High value pellets especially important in the packaging industry. **Natural has no added pigments**. **White finds use in opaque, light-coloured end products**
- Common areas of use include primary product packaging (e.g. cleaning bottles), household goods, other injection moulding parts.
- The prices exhibit large premia to virgin HDPE but requires extensive processing – such as hot washing and deodorisation.

Source: Argus Media - Consulting Services

rHDPE rigid mix cold washed (rHDPE pipe)

rHDPE pipe not affected by PPWR, constrained by virgin price forecast

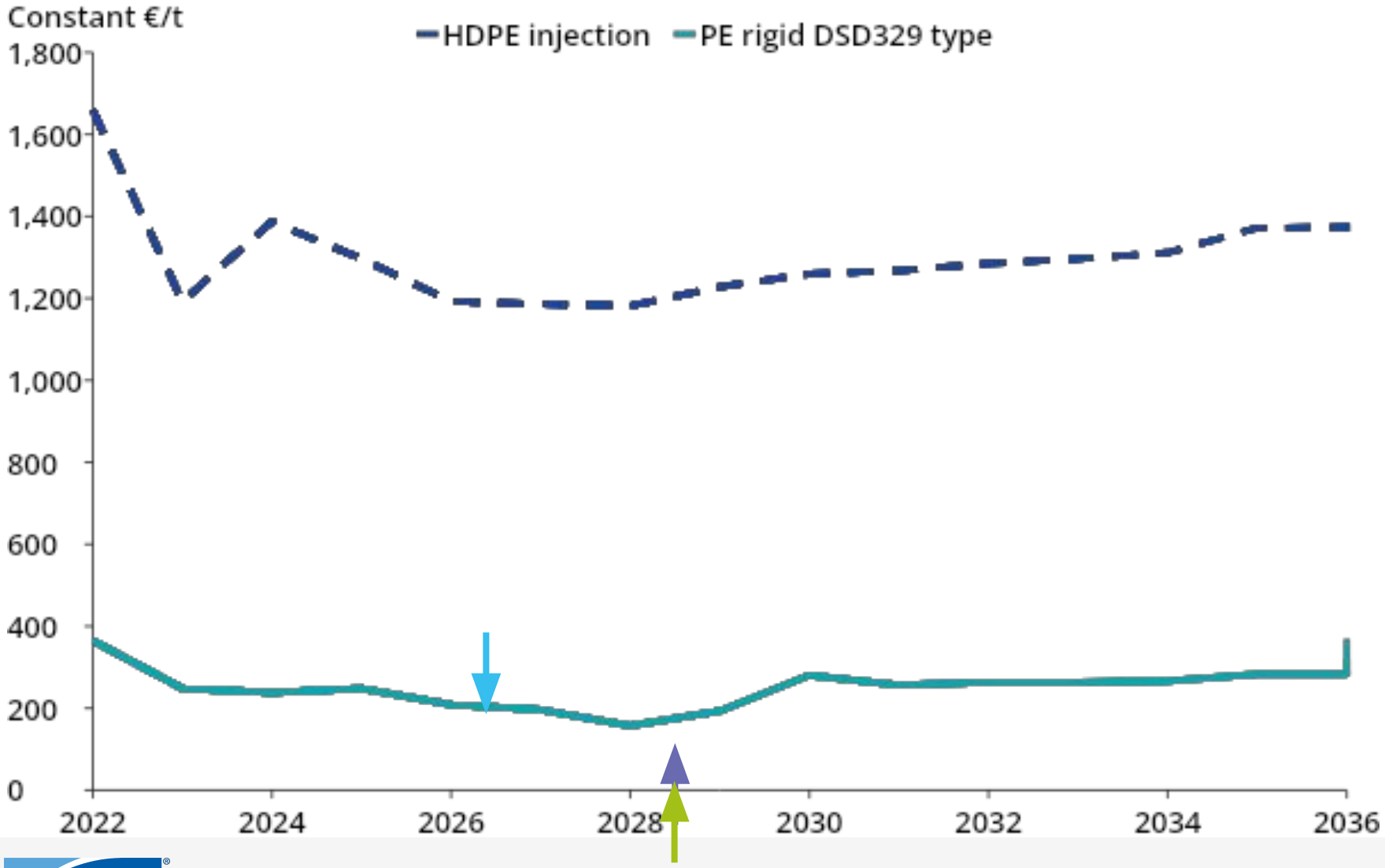


- **Sorted out from PE bales after removing high value streams** (e.g. natural, white) and processing together what is left – usually by washing them in cold water to remove dirt before being processed together.
- Applications in areas where performance is more important than appearance.
- Areas of use include construction – such as pipes and ducts – and in outdoor products such as bins and containers.

Source: Argus Media - Consulting Services

PE rigid DSD329 type

WSR and EU ETS are expected to impact the prices of the PE rigid DSD329 bale in addition to pellet effects

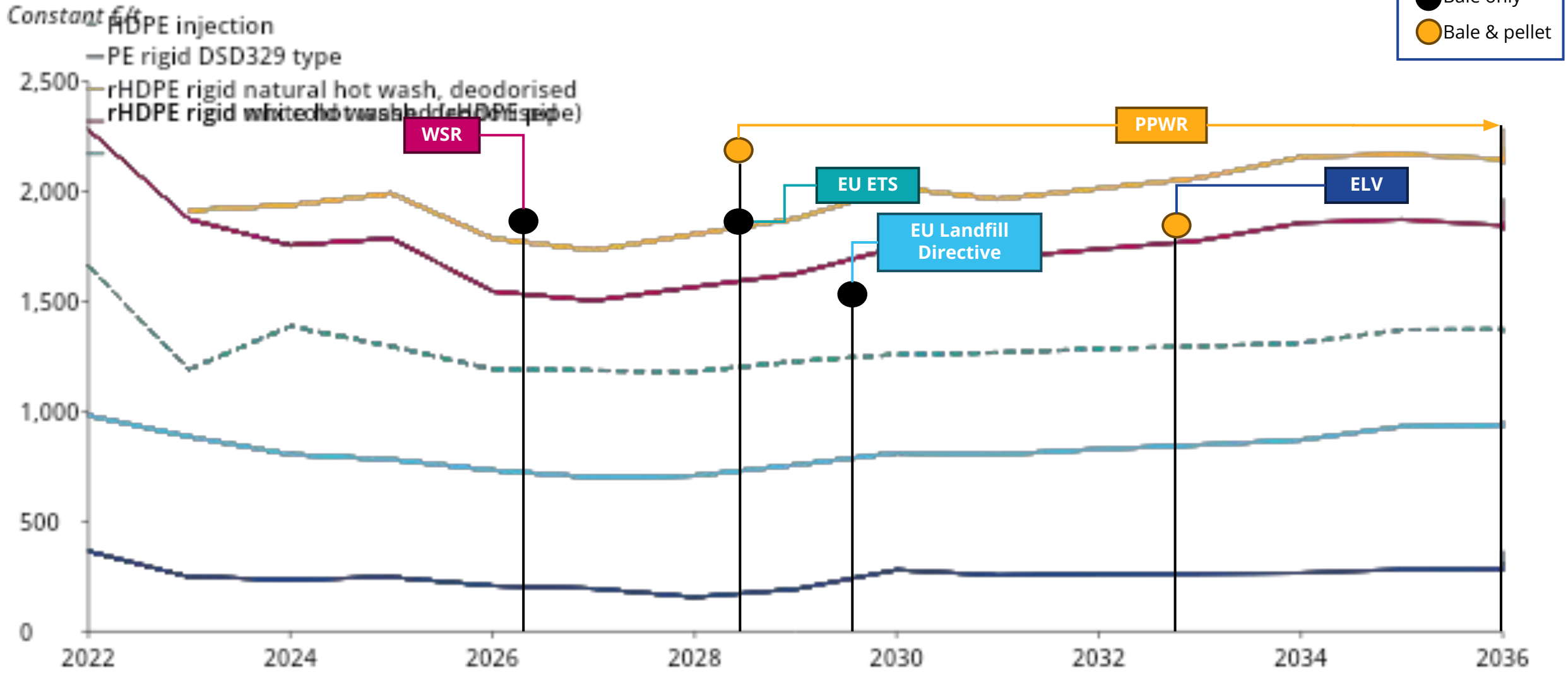


- Made up of natural, white, and coloured HDPE rigids. **Prices are linked to its composition, and to the end-products.**
- Large demand segments for PE rigid bales include packaging and construction.
- Bales are subject to seasonality, with higher prices usually achieved in the first two quarters of the year, ahead of the high Spring/Summer peak demand season.

Source: Argus Media - Consulting Services

Mechanical Recycling Summary - rHDPE

ELV and PPWR to support stronger pellet prices during forecast



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EU Packaging and Packaging Waste Regulation (PPWR)

PPWR aims to reduce packaging waste whilst improving recyclability and encouraging the use of recycled materials

Aim: Reduce packaging waste through promoting reuse, recycling and other forms of recovering of packaging waste. Additionally, requires Extended producer responsibility (EPR) schemes and that all packaging on the EU market will be recyclable in an economically viable way by 2030.

Targets	2030 Targets*	2040 Targets*
Recycling	All plastic must be recyclable by 2030	
Contact-sensitive plastic recycling content from PCR (e.g. food packaging)	10%	25%
Non-contact-sensitive plastic recycling content from PCR	35%	65%
Non-contact /secondary plastic recycling content from PCR	35%	65%
Recycled target base for plastic in member states**	30% by 2030	50% by 2040
Packaging waste per capita cap vs 2018	5% reduction	Mid-target of 10% by 2035 15% reduction
Mass-balance approach	Fuel-based: discounts system reuse (~25%.) and process losses(~5%.) Polymer-only: and anything not going towards the polymer (another ~30%.).	

Producer Responsibility Scheme	Previous Targets (%)	2025 (%)	By 2030 (%)
All packaging	55	65	70
Plastics	25	50	55

* for non-PET plastics. For PET, 30% in 2030 (including contact-sensitive), and 65% in 2040 (50% for contact-sensitive packaging)
** Member states can request delays up to 5 years, but not reduce a target by more than 15% and no plastic targets can be reduced to less than 30%

Source: Argus Media - Consulting Services

End-of Life Vehicles Regulation

Lays down the recycled content requirements for automotive

Aim: Reduce material usage and waste of vehicles materials by setting recycled targets.

Recycled content after 6 years	Recycled content after 10 years	Of which from ELV waste	Post-industrial allowed to count?	Derogations possible for lack of availability or excessive cost?	Bans Export of Used, non-roadworthy vehicles?
15pc	25pc	20pc	No	Yes	Yes

Other Highlights:

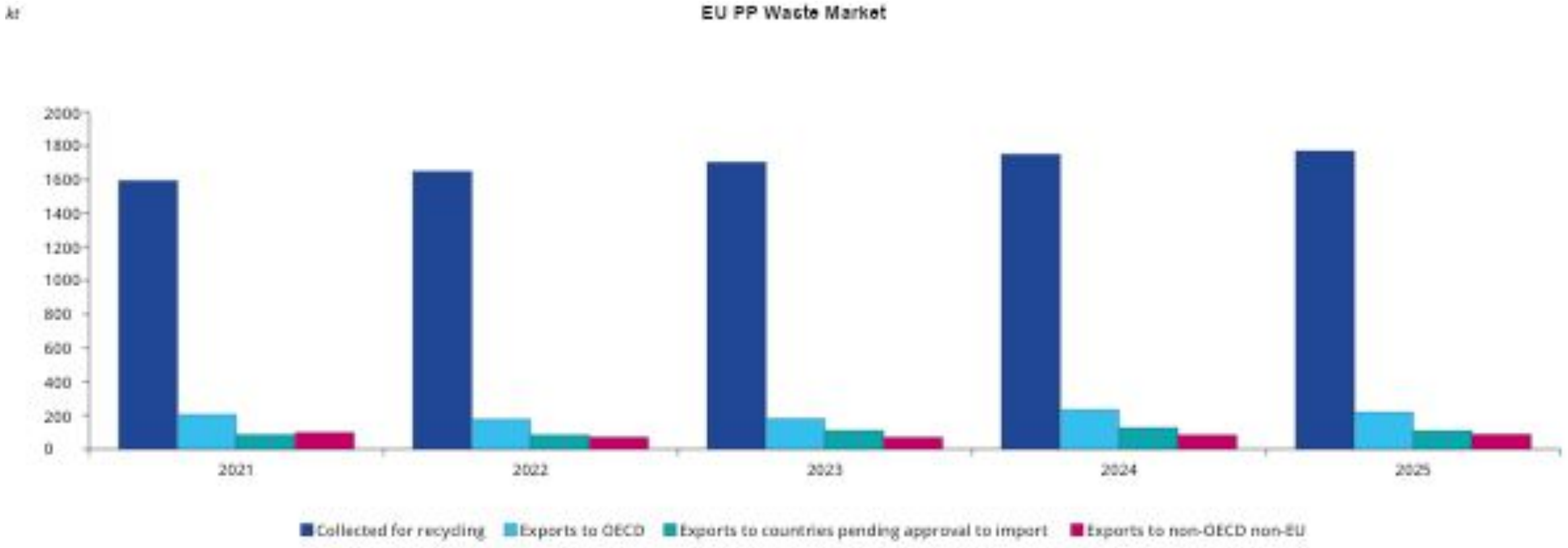
- Establishes a cross-border extended producer responsibility (EPR) scheme
- Allows chemical recycling to contribute to targets; details of mass balance accounting to be finalised
- Introduces design requirements for new vehicles
- Review of biobased materials 72 months prior to entry into force
- Imports banned for first 48months, with systems similar to SUPD IA required after that

Source: Argus Media - Consulting Services

Waste Shipment Regulation

Although WSR governs all EU trade, the rules are expected to impact exports more significantly

Aim: Limit imports from non-OECD countries unless the EU Commission specifically authorizes them.
Blanket ban on exports of plastic waste to non-OECD countries from November 2026 for 30 months.

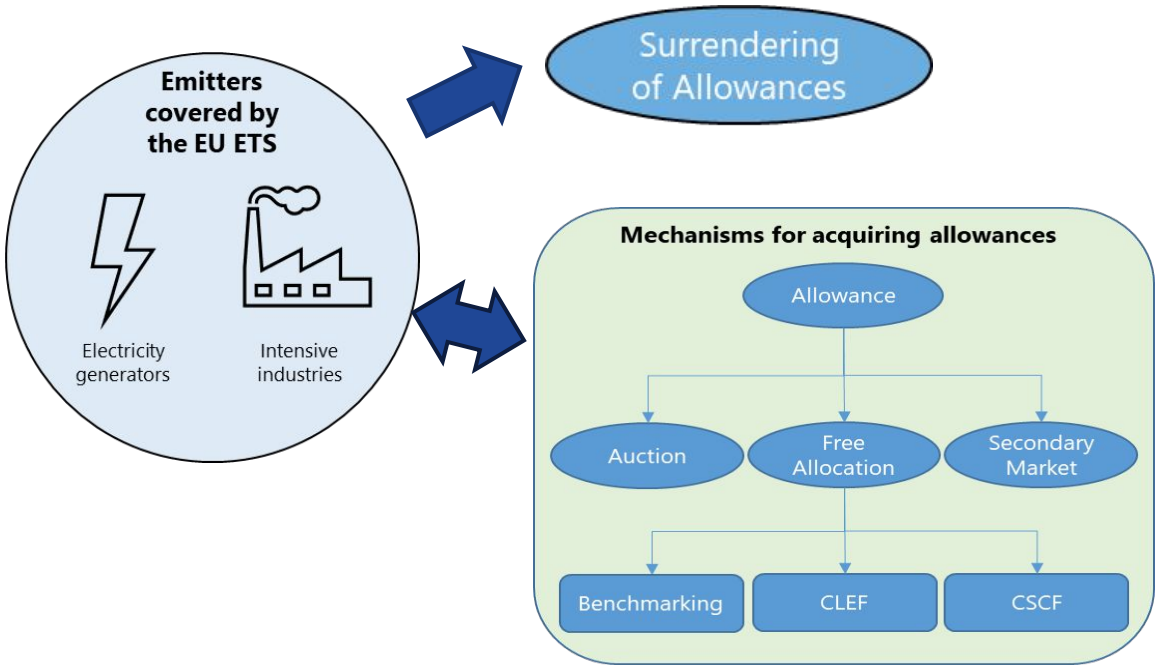


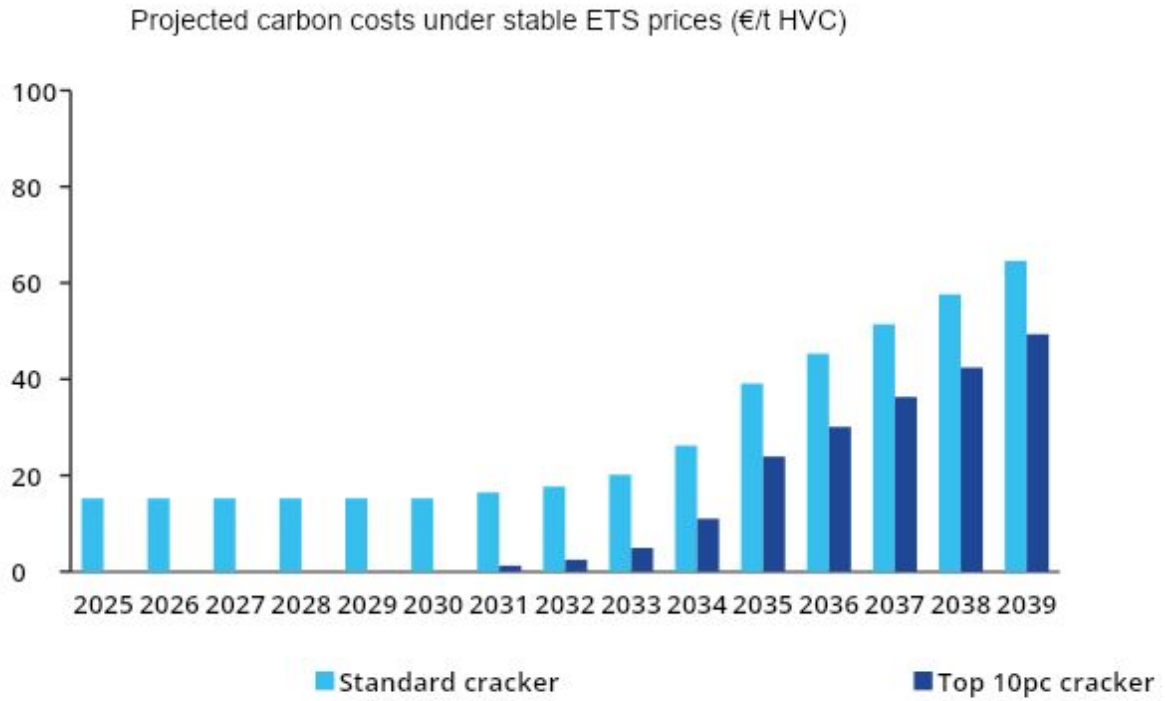
Source: Argus Media - Consulting Services

EU Emissions Trading System (ETS)

Carbon emissions trading schemes aim to incentivise the decarbonisation of the chemical industry

Aim: Lower CO2 emissions by setting a cap on energy intensive industries. Currently provides free allowances to emitters which are expected to decrease in line with CBAM requirements.
There is a proposal to include municipal waste incinerators or decrease threshold for units.





Source: Argus Media - Consulting Services

EU Landfill Directive

Will increase material available

Aim: To have less than 10% of municipal waste in member states going to landfills by 2035.
Sets landfilling rules for biodegradable and recyclable waste, including ban on waste suitable for recycling or energy recovery.

Category	Key Elements
Biodegradable Waste Reduction	Member States must reduce due to methane emissions and environmental risks.
Landfill Types & Waste Acceptance	Defines three landfill categories (hazardous, non-hazardous, inert) and requires standardized waste acceptance, classification, and testing.
Technical & Operational Standards	Requires impermeable liners, leachate collection, gas management, safe siting distances, and long-term aftercare of at least 30 years.
Monitoring & Reporting Requirements	Mandates quality-control and traceability systems, plus national reporting every three years.
Compliance & Enforcement	2024 amendment strengthens enforcement measures and introduces electronic permitting (e-permits) by 2035.
Environmental Protection Measures	Protects groundwater, air, and soil through strict engineering requirements, leachate control, and mandatory groundwater monitoring.

Source: Argus Media - Consulting Services

