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The Role of the Packaging & Packaging Waste Regulation in Europe's Plastic Industry

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Introduction

Plastics are ubiquitous in the modern world. Perhaps most commonly associated with packaging in the minds of the public, plastics are equally prevalent in durable products – in a multi-layered solar panel, an under-the-hood radiator shroud, or the pipework in a new building, for example. Although plastics are often irreplaceable because of their unique combination of lightweight and physical properties, the need to improve "circularity" of the plastic value chain – through recycling and bio-based feedstocks – has never been more pressing. Circularity reduces the carbon intensity of plastic production and mitigates against post-consumer waste plastic heading to landfill or incineration.

In early 2025, a significant milestone occurred in Europe's circular plastic economy – the enshrinement of the Packaging & Packaging Waste Regulation (PPWR) into EU law, with the first provisions coming into effect in summer 2026 and targets for recycled content in plastic packaging from 2030 that are expected to have immediate and wide-reaching implications for an already-pressurized plastic industry in Europe.

Argus Media's Consulting division tracks ongoing developments in plastic markets. In the following questions and answers, Argus has addressed its perceived impact of PPWR, and how it seeks to address clients' concerns in the plastic industry. Though much of the text is in specific relation to polyolefins, many of the concepts are transferable to other plastics.

What is PPWR and why is it an urgent issue?

PPWR is an EU directive with a series of compulsory targets. Its main objectives include (1) ensuring all packaging in the EU is designed for recycling; and (2) ensuring that post-consumer recycled (PCR) content re-enters packaging. The PCR content targets differ depending on whether the packaging is contact sensitive and not made of PET (10pc by 2030; 25pc by 2040), is a beverage bottle (30pc by 2030; 65pc by 2040), or falls under "other packaging" (35pc by 2030; 65pc by 2040). PPWR aligns with the EU's broader sustainability goals, complementing the EU Circular Economy Action Plan and Green Deal objectives.

Can mechanical recycling meet the demands of PPWR?

PPWR sets ambitious recycling targets for mandatory PCR content into packaging, and the capacity of European mechanical recyclers to supply packaging-grade recyclates will need to grow if they are to be hit. But, while some new plants have started up in recent years, and others such as the Morssinkhof-Rymoplast Group's new HDPE/PET plant in Belgium are under construction, challenging market conditions have also led to capacity losses in the past 12 months. Industry association Plastic Recyclers Europe projects that almost 1mn t/yr of EU27+3 recycling capacity will have been lost by the end of 2025, compared with 2023, and Argus' figures show that 250,000-270,000 tons/year of mechanical recycling capacity targeted at polyolefin packaging waste have shut in the past 12 months. Some of this will be replaced or moved elsewhere, but some will not. A turnaround in fortunes is needed to make Europe an attractive place to invest in recycling before the targets come in, if capacity is to grow as required.

Furthermore, mechanical recycling may not be suitable to meet all of the targets that have been set. Mechanical recycling preserves the polymeric chemical nature, recycling the waste through a sequence of physical processes – sorting, grinding, washing, processing into pellets/flakes. Whilst closed-loop mechanical recycling systems can regenerate contact sensitive plastic, they are not mainstream; the PCR polyolefins undergo washing and odour-removing processes, but in many cases these don't meet the stringent specifications required for reuse in contact-sensitive (e.g., food) packaging applications.

Accordingly, chemical (or "advanced") recycling must play a role in generating virgin-like feedstock, which can circumvent the specification mismatch from mechanically-recycled material. Argus Media Consulting estimates that Europe's polyolefin market in 2030 will need to be comprised of around. 20pc circular production – a combination of mechanical recycling, chemical recycling, and bio-based feedstock (Figure 2). Chemical recycling relies on a chemical process to "unzip" the polymer into constituent monomers, or pyrolyze into an oil. The oil can then feed into an earlier stage of the plastic chain (Figure 1), meaning that polymers produced are chemically-identical to those produced from fossil-based feedstocks, and not held back in their end-use applications by the same safety- or performance-related constraints.

Figure 1: Simplified overview of various circular elements of the plastic economy

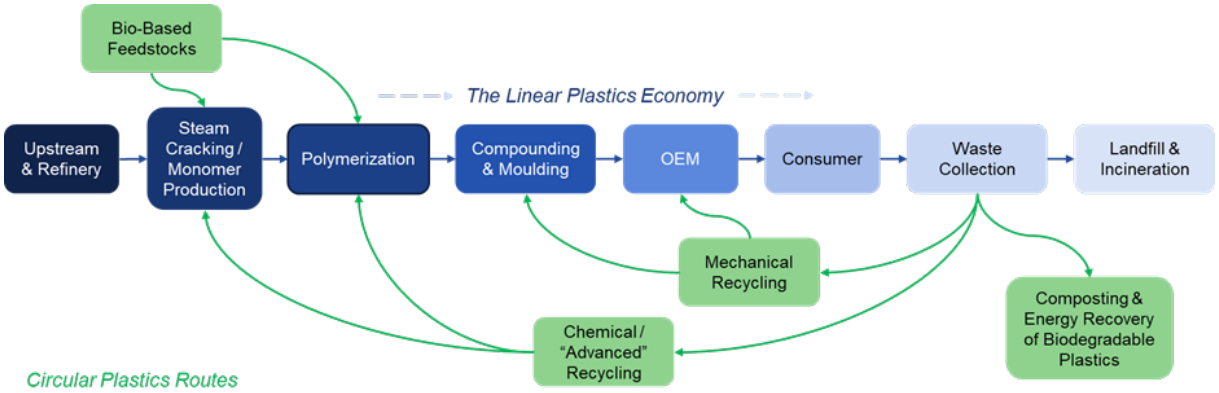
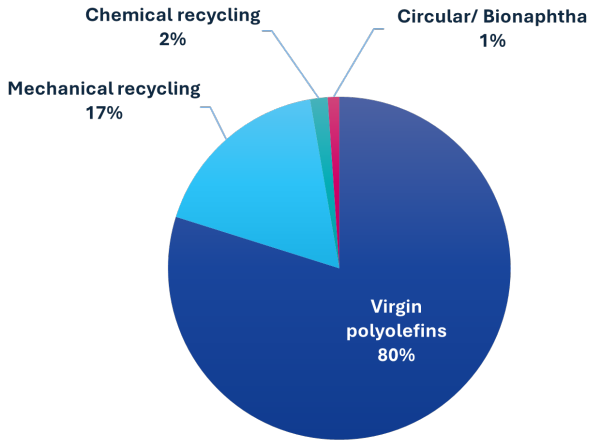


Figure 2: Estimated polyolefin demand in the EU, by origin - 2030



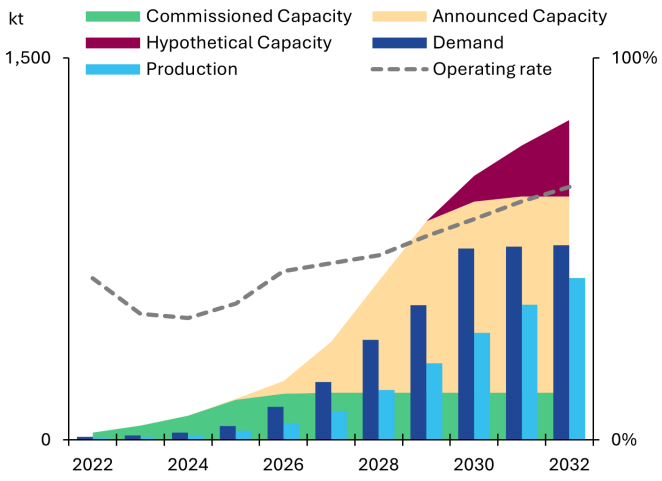
Total demand ca. 33 million tons

Can chemical recycling fill the gaps?

To meet the mandate-driven demand for contact sensitive packaging in Europe, capacity for chemical recycling must grow. Despite the urgent need to expand, chemical recycling projects have faced a series of setbacks in the past few years, including cancellations of announced plans (Dow, Neste, ExxonMobil, for example). In alignment with general trends in Europe's chemical industry, high energy costs and sluggish economic conditions have caused investor uncertainty, as has a persistent lack of clarity around chemical recycling's place within the regulations. For example, PPWR gives the EU certain flexibility to delay or change targets, or incorporate bio-based content within them, which could change demand projections. And final decisions on how mass-balance accounting can be used to track chemically-recycled content, and how recyclers exporting recycled content to Europe will be benchmarked against European environmental standard, are still pending.

In Argus' estimations, production of plastic-derived pyrolysis oil (PPO, a key output of chemical recycling facilities) has languished in the low 10s of kilotons per year, throughout 2022–25. For projects that have reached fruition, the low operating rates are indicative of challenges associated with early commercialisation of new technology. Infrastructure to supply suitable difficult-to-recycle plastic waste feedstock to plants is also still developing. And the downstream willingness to pay premium prices for chemically recycled polymers has been hampered in recent months by the same uncertainties, together with cost-cutting measures to counter price inflation and reduced consumer confidence. In Argus' model, Europe will now need aggressive expansion of capacity – both actualisation of announced plants and hypothetical additions – to meet the difficult 2030 PPWR targets for contact sensitive packaging (Figure 3). Argus' model allows for a gradual ramp-up of operating rates, and extra-regional imports of PPO to balance.

Figure 3: European plastic-derived pyrolysis oil market fundamentals, to meet PPWR's demands – 2022-2032

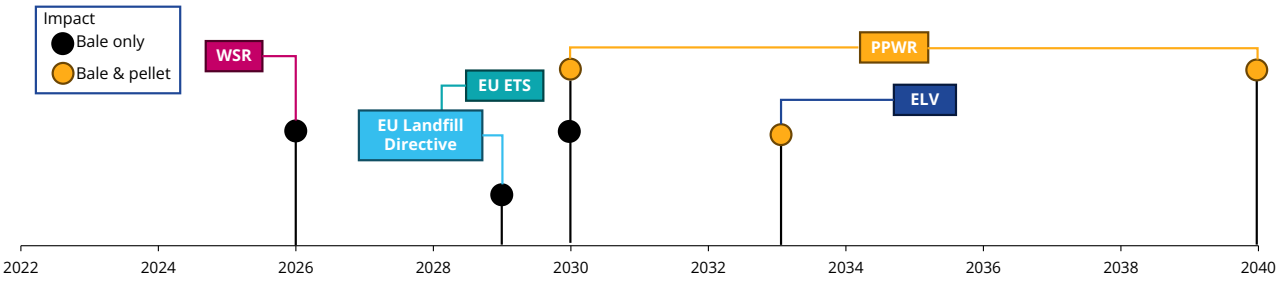


Which other European directives will play a role?

PPWR sits among a wider range of EU and country-specific directives, each with differing effects on the market fundamentals for plastics in Europe. Many of these directives have proposed or planned adaptations within the same timeframe as PPWR's key targets, 2030–40 (Figure 4). Notable directives are the EU Waste Shipment Regulation, which imposes bans on plastic waste shipments to non-OECD countries; this could have a disproportionate effect on PE films exports as those form the largest category of polyolefins waste exports to non-OECD countries, whilst polyolefins rigids and other films see more limited exports. The EU Landfill Directive bans the sending of recycled plastic to landfills, which could generate additional plastic waste towards mechanical and chemical recycling. Much of the waste currently exported is not of an attractive quality for mechanical recyclers, so there is likely to be an increase in new capacity to sort waste into more valuable forms. More waste could also become available to the chemical recycling market, for which issues such as colour are less of a sticking point than they are for mechanical recycling.

The EU Emissions Trading System's (ETS) possible future inclusion of municipal waste incinerators could also limit the amount of plastic amenable for incineration – with similar indirect implications for PPWR. There are also other proposals in the future which would increase demand for recycled plastic, such as the End-of Life Vehicle (ELV) directive which would require the inclusion of recycled plastic as well as recycled plastic from end-of life vehicles into the manufacture of new cars. In its modelling of long-term supply/demand and price forecasts for PCR materials and PPO, Argus evaluates the effects from each of these regulations.

Figure 4: Simplified view of the major milestones for various European directives, within the timeline of PPWR.



How can Argus Media Help?

In addition to market reporting on PCR and pyrolysis oil prices (including bales, regrind, pellets, pyrolysis oil), and a tracker tool for ongoing project announcements in the mechanical/chemical recycling industry, Argus Media Consulting develops long-term forecasts for mechanical and chemical recycling on a bespoke basis.

We have undertaken large-scale strategic consulting studies for major European petrochemical companies, considering their unique set of regulatory challenges. Argus Media Consulting team is supported by a wider team of subject-matter experts, spanning virgin and recycled polymers and their feedstocks.

Argus Media's wide coverage of commodity markets ensures that clients receive evidence-based, accurate and transparent solutions.

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