# Chemical recycling of plastics demands over €400 billion to reach economic viability, says Bain



Chemical recycling of plastics has emerged as a focal point in the ongoing discourse regarding sustainable solutions to the plastic pollution crisis. However, a new analysis by Bain & Company reveals that achieving cost parity between chemically recycled plastics and virgin materials may require cumulative investments exceeding €400 billion globally. This eye-watering figure underscores the significant financial hurdles that must be overcome to make chemical recycling a viable alternative to traditional methods, particularly as the existing technologies, such as pyrolysis and gasification, remain economically uncompetitive.

In its latest report, titled "Chemical Recycling: Plastics Firms Must Move Now or Miss Out," Bain & Company elaborates on the stark cost differentials encountered in advanced recycling processes. Current estimates indicate that producing chemically recycled polyolefins in Europe costs more than double that of virgin plastic production. Consequently, the uptake of these technologies is largely limited to niche markets prepared to pay a premium. Mark Porter, Head of Bain’s global Chemicals practice, remarked that “it would take at least 20 to 30 years and by then recycled plastic would account for approximately 20–30 per cent of total plastic demand.”

Reaching this cost parity will not be straightforward. Bain's analysis suggests that to achieve the target of 650 million metric tonnes of recycled polyolefins via pyrolysis, substantial advancements in market conditions and gate fees are necessary. The pathway is complicated further by an additional cumulative cost premium of €270 billion, covering regulatory offsets and customer premiums. While innovations such as hydraulic sorters and enzymatic decontamination processes hold promise for reducing operational costs, regulatory support will be essential. Porter stressed the importance of a “systems approach” to transition the market from dependency on subsidies to a sustainable, demand-driven model.

Regulatory frameworks play a crucial role in bridging the existing supply-demand gap. While the European Union's Packaging and Packaging Waste Regulation (PPWR) sets ambitious recycling targets for 2030, its success hinges on the industry's ability to rapidly scale up supply. This challenge is compounded by the risk-averse nature of the sector, where thin margins in virgin plastics limit the capacity for long-term investments. The report advocates for regulatory measures similar to those applied in the renewable energy sector, which could significantly increase recycled content requirements.

Such measures, including annual blending increases of recycled materials, could facilitate a shift towards a robust market for recycled polymers, with Bain estimating that this approach could yield a market share of over 15% by 2040. However, without immediate and coordinated policy intervention to incentivise investment, the chemical recycling sector risks remaining sidelined in the broader plastics value chain.

Industry movements indicate a growing recognition of the need for financial and technological commitment. Recent announcements from PlasticsEurope highlighted a jump in planned investments in chemical recycling, raising projections from €2.6 billion in 2025 to €8 billion by 2030. This initiative aims to produce 1.2 million tonnes of recycled plastics by 2025, underscoring the industry's dedication to addressing plastic waste while aligning with the EU Green Deal's sustainability ambitions. Still, as noted by Bain, these investments are merely the beginning; achieving the full potential of chemical recycling will necessitate an estimated €400 billion infusion across global markets.

Meanwhile, an additional report by Zero Waste Europe casts a shadow over the commercial viability of chemical recycling technologies. It suggests that, under current conditions, pyrolysis may take as long as 50 years to become economically feasible. This raises important questions about the long-term sustainability of continued virgin plastic production alongside these emerging technologies, especially when the root issues of plastic waste stem from upstream factors such as consumption patterns and single-use products.

Ultimately, without collaborative efforts to reshape regulatory landscapes and bolster technological development, the path to a sustainable plastics ecosystem remains fraught with challenges. As the industry faces a risk gap concerning the scale of required investments and the limited market readiness to absorb chemically recycled outputs, urgent action from both policymakers and businesses will be paramount to integrating chemical recycling into mainstream practice.

## Reference Map:

* Paragraph 1 – [[1]](https://packagingreporter.com/materials/e400-billion-investment-required-to-make-chemical-recycling-economically-viable/), [[4]](https://www.mckinsey.com/industries/chemicals/our-insights/no-time-to-waste-what-plastics-recycling-could-offer)
* Paragraph 2 – [[1]](https://packagingreporter.com/materials/e400-billion-investment-required-to-make-chemical-recycling-economically-viable/), [[6]](https://www.zerowasteeurope.eu/press-release/still-fifty-years-to-commercially-scale-pyrolysis-technologies-new-paper-finds/)
* Paragraph 3 – [[5]](https://www.mckinsey.com/industries/chemicals/our-insights/plastics-recycling-using-an-economic-feasibility-lens-to-select-the-next-moves), [[2]](https://www.chemicalrecycling.eu/news/european-plastics-manufacturers-plan-7-2-billion-euros-of-investment-in-chemical-recycling/)
* Paragraph 4 – [[3]](https://www.chemicalrecycling.eu/news/european-plastics-manufacturers-plan-8-billion-euros-of-investment-in-chemical-recycling/), [[7]](https://www.innovationnewsnetwork.com/eu-greenlights-e500m-investment-in-chemical-recycling-for-plastic-waste/55118/)

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## Bibliography

1. <https://packagingreporter.com/materials/e400-billion-investment-required-to-make-chemical-recycling-economically-viable/> - Please view link - unable to able to access data
2. <https://www.chemicalrecycling.eu/news/european-plastics-manufacturers-plan-7-2-billion-euros-of-investment-in-chemical-recycling/> - PlasticsEurope has announced a significant increase in planned chemical recycling investments, raising the amount from €2.6 billion in 2025 to €7.2 billion by 2030. This initiative aims to accelerate the transition towards a circular economy by enhancing chemical recycling technologies. The investment is expected to produce 1.2 million tonnes of recycled plastics in 2025 and 3.4 million tonnes in 2030. The move underscores the industry's commitment to addressing plastic waste and supporting the EU Green Deal's climate and sustainability objectives. However, substantial additional investments are still needed to fully realise the potential of this technology.
3. <https://www.chemicalrecycling.eu/news/european-plastics-manufacturers-plan-8-billion-euros-of-investment-in-chemical-recycling/> - PlasticsEurope has announced a significant increase in planned chemical recycling investments, raising the amount from €2.6 billion in 2025 to €8 billion by 2030. This initiative aims to accelerate the transition towards a circular economy by enhancing chemical recycling technologies. The investment is expected to produce 1.2 million tonnes of recycled plastics in 2025 and 3.4 million tonnes in 2030. The move underscores the industry's commitment to addressing plastic waste and supporting the EU Green Deal's climate and sustainability objectives. However, substantial additional investments are still needed to fully realise the potential of this technology.
4. <https://www.mckinsey.com/industries/chemicals/our-insights/no-time-to-waste-what-plastics-recycling-could-offer> - McKinsey & Company explores the economic potential of plastics recycling, highlighting that the chemical industry could generate a profit pool of $55 billion per year by 2030 through enhanced recycling efforts. The report discusses the viability of various recycling technologies, including pyrolysis, and the importance of scaling up these processes to achieve cost parity with virgin plastic production. It also emphasises the need for significant investments and supportive policies to realise the full potential of recycling technologies in addressing the plastic waste crisis.
5. <https://www.mckinsey.com/industries/chemicals/our-insights/plastics-recycling-using-an-economic-feasibility-lens-to-select-the-next-moves> - McKinsey & Company examines the economic feasibility of plastics recycling, noting that only a limited number of recycling opportunities currently provide a positive return on investment. The analysis suggests that, at an oil price of $60 per barrel, approximately 20% of recycling initiatives are value-creating, while around 50% generate positive earnings before interest, taxes, depreciation, and amortisation but do not create value. The report highlights the need for substantial capital investment and supportive policies to make recycling technologies economically viable.
6. <https://www.zerowasteeurope.eu/press-release/still-fifty-years-to-commercially-scale-pyrolysis-technologies-new-paper-finds/> - Zero Waste Europe published a report stating that chemical recycling technologies, particularly pyrolysis, may not become commercially viable for up to 50 years under current conditions. The report calls for a reduction in virgin plastic production and prioritisation of upstream solutions to single-use plastics, such as waste prevention, reuse, and recycling. Experts warn that pyrolysis relies on continued virgin plastic production and cannot be considered fully circular, even if scaled up.
7. <https://www.innovationnewsnetwork.com/eu-greenlights-e500m-investment-in-chemical-recycling-for-plastic-waste/55118/> - The European Commission has approved a €500 million scheme by France to support chemical recycling, an advanced method for repurposing plastic waste. This initiative aligns with the EU's commitment to building a more circular and resilient economy. The funding aims to drive innovation in recycling technologies, reduce dependency on fossil-based raw materials, and move the industry closer to climate neutrality. The scheme is designed to encourage participation from businesses of all sizes and across various industries, providing financial aid in the form of direct grants covering up to 40% of the additional investment costs required for chemical recycling projects.