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New report highlights fossil-free plastics as strategic opportunity for Europe's industrial resilience

- *Systemiq study calls for acceleration of fossil-free plastic production as a key pillar of a competitive, circular and climate-aligned European plastics system*
- *Even in a highly circular system with ambitious recycling and reuse strategies, at least half of all plastics demand would likely still be required from virgin fossil sources by 2050.*
- *Scaling fossil-free plastics production offers a strategic opportunity to boost industrial resilience, unlock green investments, protect jobs and strengthen Europe's clean materials leadership.*

BRUSSELS, 28 May 2025 – A new report released today by Systemiq urges the European Union to take bold action to develop fossil-free plastics at scale alongside established "reduce-reuse-recycle" circularity measures. This would help meet net zero goals, reduce dependence on fossil feedstock, and restore Europe's industrial leadership in clean materials.

Titled ***Fossil-Free Plastics: Driving Clean Industrial Leadership in Europe***, the report highlights that, even in ambitious scenarios, recycling and reuse strategies would likely meet up to 50% of plastics demand by 2050. To meet the remaining demand sustainably, Europe must accelerate sustainable production pathways – including green-methanol-to-olefins (MTO) – to produce fossil-free virgin plastics at scale.

The report was commissioned by Vioneo and developed independently by Systemiq, drawing on the firm's established analytical approach, new modelling, data analysis, and expert input from academia, civil society, and industry.

"*Plastics are essential to modern economies – but current production and disposal systems drive emissions, pollution, and industrial risk,*" said **Sophie Herrmann, Partner at Systemiq**. "*This report builds on our previous modelling of plastics and chemicals systems, where MTO has consistently emerged as a high-potential pathway. It shows how fossil-free plastics can cut emissions, offer full traceability, and strengthen Europe's clean tech leadership. No solution is without trade-offs, but this approach stands out for its balance of climate impact and industrial feasibility – and deserves a central role in Europe's transition strategy.*"

''*As the Commission puts the Clean Industrial Deal into action and develops its bio-economy strategy, we welcome this report as both timely and useful in providing new analysis, insights and ideas for us to consider.*'' *said* ***Aurel Ciobanu-Dordea, Director for Circular Economy at European Commission (ENV).***

"*This report shines a light on a blind spot in the plastics transition*," said **Alex Hogan, CEO of Vioneo**. "*Recycling is vital—but it isn't the whole answer. Fossil-free plastics fill the gap, and in doing so, offer a lifeline for Europe's chemicals and plastics industries to turn today's energy, climate and supply chain risks into tomorrow's competitive edge.*"

Vioneo is the first company aiming to produce two of the most widely used plastics in packaging and manufacturing – polyethylene (PE) and polypropylene (PP) – at scale using MTO technology based on green methanol and electrification.

From fossil dependence to clean innovation

The report presents MTO technology as a scalable, drop-in production pathway that uses renewable carbon sources – like sustainable biomass or captured biogenic CO_2 – to produce recyclable polyethylene and polypropylene plastics. Unlike many bio-based or recycled plastics that rely on mass-balancing, MTO enables fully segregated supply and traceability, offering greater credibility, customer assurance, and alignment with emerging policy. These fossil-free plastics match the performance of fossil-based materials and are compatible with existing infrastructure.

Key findings from the report:

- Established reduce-reuse-recycle circularity approaches are essential – but not sufficient: Even with ambitious application of these approaches, Europe will require ~28 million tonnes of virgin plastic annually in 2050.
- Emissions are rising: Without action, Europe's plastics system could emit 180 Mt CO_2eq/year by 2050, 40 Mt more than today. Fossil-free plastics could cut emissions by ~5 tonnes of CO_2eq per tonne of plastic produced – and up to 7 in optimal conditions.
- Cost parity is achievable: At scale, fossil-free plastics can match the cost of abated fossil production, enabled by falling green methanol prices and carbon pricing.
- Segregated production is a strategic advantage: MTO provides a fully traceable production pathway, with advantages over mass-balancing approaches that are traditionally used for bio-based plastics.
- Industrial benefits for Europe include improved supply chain resilience, reduced reliance on fossil imports, and the retention of skilled jobs in the chemicals and plastics sector—helping protect against deindustrialisation while mobilising up to €30–40bn in new investment and green methanol demand.
- Industry is already investing – but leadership is needed to accelerate deployment, secure demand, and grow the market.

A call for policy and market action

To unlock scale, the report stresses the need for **EU policy clarity and market confidence**. While first-of-a-kind projects are nearing final investment decisions, progress is held back by regulatory uncertainty and commercial risk.

The study outlines four priority areas for action:

1) **Mobilise early-adopter customers:** Early customer commitments are needed to launch first commercial projects, especially in high-spec sectors like automotive, medical, or food packaging.
2) **Send clear policy signals**: Define fossil-free plastics as a strategic priority in upcoming EU industrial and climate frameworks to build market and investor confidence.
3) **Establish market foundations:** Legally define green methanol-based plastics, harmonise carbon accounting rules and integrate fossil-free criteria into key EU policies.
4) **Deliver structural market support:** Introduce demand-side targets, level the playing field via carbon pricing, and provide public funding to derisk early investments.

An integrated pathway for Europe's plastics transition

The report presents a clear conclusion: Fossil-free virgin plastics made from renewable carbon are a critical pillar of a circular, net-zero aligned plastics system. With the right policy signals and market conditions, they can help Europe meet its climate goals – while anchoring a modern industrial strategy that protects supply chains, secures skills, and positions European industry at the forefront of the global clean materials race.
The study is available for download at: www.systemiq.earth/FFP

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NOTES TO EDITORS

About this study

Fossil-Free Plastics: Driving Clean Industrial Leadership in Europe is an independent study by Systemiq examining the potential role of fossil-free plastics – particularly via the methanol-to-olefins (MTO) technology pathway – in building a competitive, circular and climate-aligned European plastics system. Commissioned by Vioneo, the report reflects Systemiq's independent perspective and builds on its previous modelling of plastics and chemicals transitions, where MTO has consistently emerged as a high-potential solution. It draws on new system modelling, data analysis, and input from an expert panel spanning academia and civil society, to assess the emissions impact, scalability, and industrial value of fossil-free production. The report highlights that even in a highly circular European plastics system with widely deployed state-of-the-art recycling infrastructure in 2050, half of all market demand would likely still be required from virgin sources. Fossil-free MTO technology offers a scalable route to meet this demand while cutting emissions, strengthening clean tech competitiveness, and reducing fossil dependence. www.systemiq.earth/FFP

About Systemiq

Systemiq is a systems change company that works with businesses, policymakers, investors and civil society organisations to reimagine and reshape the systems that sit at the heart of society - energy, nature and food, materials, built environment, and finance - to accelerate the shift to a more sustainable and inclusive economy. Founded in 2016, Systemiq is a certified B Corp with offices in Brazil, France, Germany, Indonesia, the Netherlands, and the UK. Find out more at www.systemiq.earth or via LinkedIn.

About Vioneo:
Vioneo aims to pioneer the sustainable transition of the chemical sector by using green methanol to produce fossil-free polypropylene and polyethylene at a commercial scale. The first plant, based in Port of Antwerp, will use green methanol to produce approximately 300,000 tonnes of fossil-free virgin plastics.

Vioneo is owned by A.P. Moller Holding, the parent company of A.P. Moller Group, and was launched as part of its commitment to advancing green methanol production and promoting sustainable practices in the plastics industry. Find out more at www.vioneo.com.