

PLASTICE

New technologies to integrate PLASTIC waste in the Circular Economy

Training materials

Module 3: Policy Alignment – Towards a Coherent and Supportive Framework for Plastic Recycling



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MODULE 3 Overview

This module is composed by a single unit, that include: key messages from the Circular Recycling Forum, insights into policy alignment for advanced plastic recycling, and recommendations to foster synergy between mechanical and chemical recycling technologies within the EU regulatory framework.



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Unit 3.1

Closing the circle: Pathways for synergistic plastic recycling system

*Plastic waste recycling remains a **critical challenge**, with only 20% of plastic waste currently recycled in Europe. **Policy alignment** is crucial to ensure that innovations in chemical, mechanical, and enzymatic recycling can be effectively implemented. **This module identifies key policy gaps and provides recommendations for a coherent regulatory framework** that supports the deployment of innovative recycling technologies while promoting sustainability, economic viability, and integration into industrial applications. EU produces **30 Mt of plastic waste annually**, almost **70% to landfill and incineration**. To reduce this percentage to minimum levels, the main importance should be given to the synergy between mechanical and chemical recycling, not avoiding none of them. Just integrate them strategically to enhance the circularity of plastics, optimizing resource sustainability.*

***Mechanical recycling** of plastics is more efficient in terms of energy and money but when talking about complex plastic mixtures, **chemical recycling** can serve as a “breaker” to separate those polymers into their structural unit and recover for reuse as a recycled plastic.*

Key points of Module 3

- **Policies** must facilitate the adoption of advanced recycling technologies for mixed and contaminated plastic waste.
- **Incentives** should encourage the use of high-quality recycled materials in industrial applications to reduce reliance on virgin plastics.
- **Harmonized regulations** across EU countries can enhance circularity by promoting standardized sorting, processing, and recycling criteria.
- Regulation and adaptation of chemical recycling with the creation of a **complementary regulatory framework**
- Promoting synergistic systems of recycling by increasing **investment** in research on processes and case studies where such mixed plastics streams are generated



Introduction

Plastic waste management in Europe faces **significant hurdles** due to the **complexity** of waste streams, **limitations** in mechanical recycling, and a **lack of economic incentives** for secondary raw materials. The **PLASTICE** project addresses these challenges by testing and implementing **innovative recycling pathways**, including pyrolysis, gasification, and enzymatic hydrolysis. While technological advancements are key, regulatory frameworks must evolve to support the scalability and adoption of these processes. This module examines the **policy landscape surrounding plastic recycling** and explores how regulatory adjustments can foster a circular economy for plastics, reducing landfill dependency and enhancing resource efficiency.

The importance of a **comprehensive understanding of the nature of plastic waste streams** generated and discarded by industries and consumer is crucial for designing efficient and sustainable recycling pathways. Without this knowledge may arise inefficiencies in sorting, processing leading to the loss of potential value chains and undermining the effectiveness of circular economy strategies.

Chemical recycling still not having a clear « industry definition », different entities are working in establish an accepted objective across the value-chain. Fully recognition must be applied to chemical recycling as a recycling method, developing a framework where the vision must offer all technologies for the no-end recycle all polymer into its original components/other products.

Policy challenges and opportunities in plastic recycling

Effective policy frameworks are fundamental to increasing plastic recycling rates and integrating recycled materials into high-value applications. The PLASTICE project highlights several policy-related challenges and opportunities:

- **Regulatory barriers to advanced recycling:** Current regulations often favour mechanical recycling but lack clear guidance for chemical and enzymatic recycling pathways. Streamlining approval processes for novel recycling technologies is essential to encourage investment and industry adoption.



- **Economic incentives and market integration:** Many secondary raw materials derived from plastic waste face market challenges due to cost competitiveness with virgin plastics. Policy interventions such as tax benefits, subsidies, or mandatory recycled content quotas can help bridge this economic gap and create a stable demand for recycled polymers.
- **Standardisation and certification:** The variability of recycled plastic quality remains a concern for industrial applications. A harmonised certification system across the EU can provide transparency, ensuring that recycled materials meet safety, performance, and sustainability criteria.
- **Extended Producer Responsibility (EPR) and eco-design policies:** Strengthening EPR schemes can drive better waste sorting and collection, while mandating eco-design principles can enhance the recyclability of plastic products from the outset. Policies encouraging modular design, material labelling, and easy disassembly can significantly improve recycling efficiency.
- **Cross-sector collaboration and data sharing:** Policies should promote partnerships between recyclers, manufacturers, and policymakers to develop an integrated approach to plastic waste management. Digital tracking and traceability solutions, such as those developed in PLASTICE, can improve transparency and optimise resource allocation.
- **Development of a policy environment** that promotes and ensures the synergy between chemical and mechanical recycling.
- **Establish a regulatory framework** for chemical recycling: nowadays mechanical recycling still has priority in EU plastic waste management, even though it has technical limitations. Chemical recycling has the potential to effectively transform complex plastic waste into high-quality products that could compete with virgin materials. This technology must be regulated within the EU framework to facilitate the integration of these materials into existing value chains.



Conclusions

What need to be done is to:

- Establish clear regulatory pathways for innovative recycling technologies
- Implement economic incentives to enhance the competitiveness of recycled plastics
- Develop a standardized EU-wide certification framework for recycled plastics
- Strengthen Extended Producer Responsibility (EPR) to drive circularity
- Foster collaboration between industry, policymakers, and research institutions
- Avoid competition between mechanical and chemical recycling. Enhancing and prioritizing the synergies between them.
- Promote investment and development in sorting technologies to increase the feedstock available
- Promote education and awareness of chemical recycling across all the sectors and societal levels, from policymakers to industry leaders and consumers by establishing regulatory framework at European level for this technology.



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Bibliography

- Waste Framework Directive (2008/98/EC)
- Packaging Waste Directive (94/62/EC)
- Regulation No 1907/2006 REACH
- Directive about Ecodesign of energy related products (2009/125/EC)
- Directive about landfills (2018/850/UE)
- Directive about packaging (2018/852/UE)
- Directive (2019/904/EU) about single-use plastics
- Regulation (EU) No 1007/2011 on Textile Fibre Names and Related Labelling

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