Chemical Recycling in Brief

21 December 2022

In 2020, 35% of the post-consumer plastics waste collected in Europe were sent to recycling (inside and outside the EU), while the remaining quantities were sent to landfilling (23%) and energy recovery (42%). Almost 90% of the waste sent to recycling (9.1 Mt) were treated in Europe (EU27+3) to produce 5.5 million tonnes of recyclates[1]. Besides, the average post-consumer recycled content in European plastic products has amounted in 2021 to 9.9%, ranging from 2.9% in automotive sector to 25.4% in agriculture applications[2].

The Green Deal is at the heart of the EU's ambitions of becoming climate neutral and circular. To meet these ambitious objectives, plastics waste needs to be captured as a valuable resource and turned into new products. This transitioning from a linear economy to a circular economy requires different recycling technologies.

- **Chemical recycling is a necessary technology**

  Chemical recycling complements other plastics recycling options like mechanical and dissolution recycling. It is capable of processing plastics waste which would otherwise end up in incineration or landfill. It can deliver significant quantities of recycled material with virgin-like properties, therefore allowing it to be used in most demanding applications, such as those for food contact or medical purposes.

  Chemical recycling covers various technologies changing the chemical structure of the plastics waste, turning polymers back into their original molecules so they can be processed and used again and again: depolymerization / solvolysis (hydrolysis, glycolysis, alcoholysis, etc.) and thermal processes (pyrolysis, gasification, hydrogenation, etc.).
  European legislation does not qualify as recycling the conversion of waste through these technologies when they produce materials used as fuels.

- **Chemical recycling is developing**

  There is a number of ongoing projects in the plastics and recycling industries to make this technology more widespread. As it is the only sensible method of recycling for certain plastics, it must be further developed; sizeable investments are still needed to fully capture the value ofthis technology.

  In 2021, Plastics Europe announced major chemical recycling investment plans of its members in the coming years: 2.6 billion Euros by 2025 and 7.2 billion Euros by 2030, with 44 planned projects in 13 EU countries. Thanks to these investments, of which 80% concern pyrolysis and gasification, the production of chemically recycled plastics is estimated to increase to 1.2 Mt in 2025 and 3.4 Mtin 2030. With this contribution of 1.2 Mt of chemically recycled plastics by 2025, Plastics Europe plays a leading role in delivering on the European Commission's Circular Plastics Alliance target of 10 Mt recycled plastics used in European products by 2025.

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[1] The Circularity of Plastics – a European Overview
[2] Plastics the Facts 2022

The realisation of these investments requires quickly a harmonised and adequate regulatory framework in Europe (including the assurance that chemical recycling counts towards the regulatory targets for recycling and recycled content, and the acceptance of mass-balance approach for the measurement of the latter).

- **Chemical recycling enables a second life for all types of waste**
  Plastics Europe members' activities in chemical recycling in Europe include:
    - Waste turned into cheese packaging and fridge components (BASF)
    - Mattresses turned into new ones (Covestro)
      Watch this 60 second video on Closing the Loop for Polyurethane Mattresses
    - Dow receiving supply of recycled feedstocks made from plastics waste from Mura's first-of-its-kind plant in Teesside (UK), supplying major brands across the globe with sustainable plastic products
    - Trinseo to build a chemical recycling plant of polystyrene in Tessenderlo

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