

Status and Outlook for CO₂-based Products

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The impact of fossil carbon embedded in chemicals and polymers is today still mostly neglected. Nevertheless, the only way for chemicals and polymers to become sustainable and part of the circular economy is the complete substitution of fossil carbon with renewable carbon from alternative sources: biomass, CO₂ and recycling.

The presentation will focus on the complete value chain of Carbon Capture & Utilisation. Starting with an overview of developments and key players in a) technologies for carbon capture from industrial point sources, direct air and ocean capture, as well as b) electrolysis for green hydrogen production. Additionally, the use of CO₂ as chemical feedstock for building blocks and polymers has been intensively diversified. Several successfully implemented technologies used at commercial level are in place and many more at the laboratory and pilot phase. Besides the long-established use of CO₂ for the synthesis of polycarbonates, also polyurethanes are based on it. The most notable biotechnological conversion pathway of a syngas produces ethanol at commercial scale. Additionally, high interest is also observed in CO₂-based methanol and in CO₂-based hydrocarbons, which can be used for fuel, chemical and polymer applications. A current total production capacity of these CO₂-based products of ca. 1.3 Mt/a in 2022 is observed and a strong increase in capacity is expected by 2027.