

## **Challenging the “challenge-test”: are physical recycling methods suitable for food-grade polyolefins?**

Most plastics today are used in packaging, predominantly polyolefins, due to their low cost, adjustable properties, and non-toxicity. In Germany alone, 3.2 million tons of plastic were used in the packaging sector in 2021. This short-lifespan, high-volume waste stream presents significant economic opportunities under almost any thinkable future scenario.

Currently, polyolefins are rarely recycled thermomechanically for high-value applications like food packaging due to the low cost of virgin materials, high calorific value, process challenges, and most importantly restrictive legislation. However, social pressure, current legislative changes and fluctuating energy and raw material prices might change this present fact.

This presentation will provide an overview of existing input material streams to show which may generally be viable for food-grade physical recycling processes, discuss the current landscape of legislative approaches (FDA vs. EFSA) in a process-specific context and provide some information and data on challenge test procedures and hard physical limits of thermomechanical processes.