

The ChemCycling™ project

ChemCycling™ is the name of a chemical recycling project launched by BASF with the aim to manufacture products from chemically recycled plastic waste on an industrial scale. BASF cooperates with technology partners who use a thermochemical process called pyrolysis to transform plastic waste into secondary raw material (pyrolysis oil). We can feed this oil into BASF's production network (Verbund) at the beginning of the value chain, thereby saving fossil resources. The share of recycled material can be allocated to products manufactured in the Verbund by using a third-party audited mass balance approach. The result: Certified products which are indistinguishable from those manufactured from fossil feedstock and which can be used by our customers in demanding applications.



BASF is developing chemical recycling for use on industrial scale as it enables us to:

Turn plastic waste into feedstock for the chemical industry and thus contribute to a circular economy



Recycle plastic waste for which no high-value recycling processes are established yet



Replace fossil resources and save CO₂ emissions against conventional plastics production



Increase recycled content in high-performance products for applications with strict requirements on quality and hygiene



What can our customers expect from ChemCycling™?

Many of our customers want high-quality and functional plastics that are produced with recycled raw materials. They have set themselves ambitious targets regarding the use of recycled materials in their applications. With ChemCycling™ we support our customers in achieving these targets. We can offer them certified products based on chemically recycled waste plastics that are identical to products made from fossil raw materials in terms of functionality and quality. The products carry the name affix Cycled™.

Is ChemCycling™ environmentally benign?

A Life Cycle Assessment (LCA) study conducted by Sphera for BASF, which was reviewed by three independent experts, comes to the clear conclusion that pyrolysis of mixed plastic waste emits 50 percent less CO₂ than its incineration. The study also showed that CO₂ emissions are saved when manufacturing products based on pyrolysis oil under a mass balance approach instead of naphtha. The lower emissions result from avoiding the incineration of mixed plastic waste by reusing it. Moreover, it concluded that manufacturing plastics via pyrolysis or mechanical recycling results in similar CO₂ emissions. It was taken into account that the quality of chemically recycled products is similar to that of virgin material and that usually less input material is sorted out than in mechanical recycling.

What kind of waste is used?

We focus on plastic waste for which no high-value recycling processes are established yet or capacities are missing. Therefore, ChemCycling™ is a complementary approach to mechanical recycling. Examples of waste plastics which are difficult to recycle mechanically include mixed plastic waste, plastics with residues or multi-layer food packaging.

How can ChemCycling™ fulfill its potential?

Before chemical recycling can fulfill its potential, both technological and regulatory requirements have to be met. On the one hand, the existing technologies for conversion of plastic waste into pyrolysis oil need to be further developed and adapted to ensure a reliable high quality of the secondary raw material. On the other hand, the regulatory framework will determine whether the technology will become established in the waste industry. While the legislative framework of the EU builds on a technology-neutral definition of recycling, chemical recycling is not yet recognized as a process which contributes to fulfilling the plastic packaging waste recycling targets in Germany. This sends the signal that chemical recycling was a “second class” option, similar to energy recovery. Acceptance for attainment of recycling targets would be an important political signal. Similarly, incentives for recycled content should be applicable to all forms of recycling. Moreover, full acceptance of mass balance approaches is needed, both on EU and national level.