How BASF is **promoting circularity** in the automotive industry

By: Aylin Mercsak, Dr. Ivana Krkljus, Alexander Heusener

Circularity is becoming a cornerstone of sustainability in various major industries, including the automotive sector. Technology openness is the key to successful implementation of circularity in the EU.

Legislators, material producers, manufacturers, recyclers, waste managers, NGOs, and academics, lead intense discussions structured around two guiding questions: What are the main persisting barriers to circular transition in Europe and how can these be concretely addressed? With the commitment to reduce waste, recover valuable materials, and conserve precious resources recycling has evolved from a compliance measure into a strategic imperative.

BASF is at the forefront of this shift, offering comprehensive solutions that span battery recycling, catalyst recovery, and both mechanical and chemical recycling of plastics.

This article outlines how BASF is advancing the circular economy through innovation, partnerships, and scalable infrastructure.

Chemistry Driving the Circular Economy in Automotive

Second-life concepts and recycling are essential for advancing sustainable solutions in the automotive sector. BASF is committed to sustainability and environmental protection.

By focusing on recycling, BASF aims to reduce its environmental footprint, conserve resources, and contribute to a Circular Economy, that is regenerative by design. Recycling allows BASF to recover valuable materials, reduce waste, and create new products from recycled materials, thereby supporting its sustainability goals.

BASF actively promotes recycling initiatives tailored to the industry – particularly in the areas of end-of-life batteries for electric vehicles, plastic recycling, and catalyst recovery.

At Precious Metal Services and Recycling, a division of BASF Environmental Catalyst and Metal Solutions (ECMS), a prime example of catalyst recycling is showcased through the fundamental strategy that focuses on optimizing and expanding the circular materials business, particularly in the recycling of Platinum Group Metals (PGM) to support decarbonization efforts.

Although PGMs constitute a relatively small volume in final products, their extraction process results in a significant carbon footprint. In contrast, recycled metal boasts a considerably smaller carbon footprint—one kilogram of recycled metal can save up to thirty metric tons of carbon emissions.

BASF operates recycling facilities worldwide to recover metal from spent catalysts and scrap materials, fulfilling both its own PGM requirements and those of its customers. This initiative includes providing 100% recycled metal to automotive clients under the brand name Verdium™.

Battery recycling enables the recovery of valuable materials from end-of-life batteries and production scrap, which are then reintegrated into the production cycle. This reduces dependence on primary raw materials, lowers greenhouse gas emissions, and helps establish a local supply of key raw materials.

With deep expertise in the electric vehicle market and unmatched capabilities in the chemical industry, BASF has developed comprehensive battery recycling solutions. The company covers the entire value chain — from logistics and discharging to dismantling, black mass production, and refining — leveraging a strong partner network and its own production facilities.

A recent milestone is the launch of BASF's new recycling plant in Schwarzheide, Germany. The facility processes end-of-life batteries and production scrap into black mass, marking a significant step toward a sustainable circular economy.

In plastics recycling BASF is committed to both mechanical and chemical recycling processes.

Mechanical recycling of waste plastics is a crucial process in the sustainable management of plastic waste, allowing the recycled (RC) polymers to be reused in new products. The mechanical recycling process follows the "back-to-polymer" logic.

BASF is engaged in both the recycling of post-industrial plastic residue (PIR) and post-consumer plastic residue (PCR). In PIR recycling for instance manufacturing residues from thin layer films using already BASF Ultramid® PA6 are collected, pre-processed and converted back to high-quality polymer compounds.

An example for PCR recycling is the collection and reworking of PA fishnet. This recycling loop allows for high performance automotive applications made from Ultramid® RC plastics.

Another notable example for PCR recycling is the recycling of BASF's GLYSANTIN® engine coolant packaging, which involves a bottle-to-bottle closed-loop recycling system. GLYSANTIN® is

a high-performance premium engine coolant produced by BASF.

It is designed to protect engines from corrosion, overheating, and frost, ensuring optimal performance and longevity. The recycling system of its packaging ensures that used GLYSANTIN® bottles are collected, cleaned, and processed into new bottles, significantly reducing waste and the need for virgin materials.

BASF's ChemCycling® initiative is a notable example, where waste plastics and end-of-life tires are converted into chemical feedstocks, allowing for the production of new high-quality materials ("back-to-feedstock").

Grupo Antolin has implemented Ccycled® products in its offering for a number of and has commercialized projects in Car Roof Module for various OEM models.

The Ccycled® products used for this application include Isocyanate ISO 123/6/CCYD2 for Polyurethane and the engineering plastic Polybutylene terephthalate (PBT) Ultradur® S4090G6 LS HSP CCYD2 BK15077.

Other chemical recycling approaches such as depolymerization ("back-to-monomer") and solvent-based ("back-to-polymer") technologies even allow direct recycling of e.g. Polyamide from end-of-life automotive components and shredder residue.

For both technologies BASF drives feasibility studies on pilot-scale level together with players in the automotive production chain, both Tier suppliers and OEM, demonstrating end-to-end the road from waste to recycled plastics. Examples will be presented at the world's largest plastics trade fair K 2025 in October this year.

Most important for the recycling of plastics, but also other chemical products, is the quality of available waste streams. This quality determines the economically and ecologically viable recycling processes that may already be available at the highest technology readiness levels or need to be developed accordingly in the next years.

Ecosystem Collaboration

Collaboration and smart data are the cornerstones of progress in the automotive industry. BASF recognizes that new ways of collaboration are essential for advancing sustainability, particularly through its involvement in the Catena-X initiative.

This collaborative effort brings together various stakeholders in the automotive sector to enhance transparency, efficiency, and sustainability across the supply chain.

By working with industry partners, BASF aims to promote innovative practices that drive the transition to sustainable mobility. BASF's commitment to sustainability is further reflected in its substantial investments in research and development, with over €2 billion allocated annually to drive innovation in chemical solutions.

Conclusion

Through its commitment to circularity, BASF is helping the automotive industry close material loops, reduce dependency on virgin resources, and lower greenhouse gas emissions.

From pioneering recycling technologies to fostering ecosystem collaboration, BASF's approach demonstrates that sustainability and high industrial performance can go hand in hand.

As the industry continues to aim toward closed loop models, BASF's recycling solutions are paving the way for a more resilient and resource-efficient future. AI

For more information visit: www.basf.com/automotive and Circular Economy.

It is important to note that many circular economy solutions also contribute to a reduction of greenhouse gas emissions which closely links them to the aspect of carbon management – a topic which due to its complexity is being discussed in a separate article by BASF Automotive Solutions.