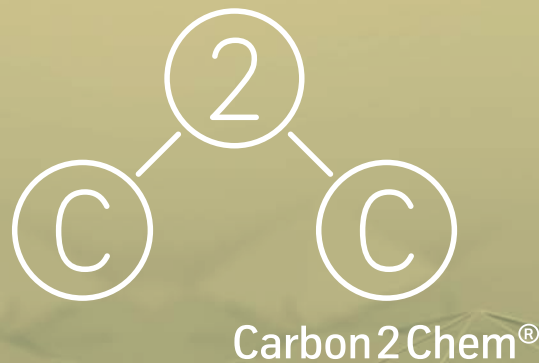


# CARBON2POLYMERS

## Project content for the period 2020 to 2024



### PROJECT AIMS

For the use of carbon monoxide (CO) from metallurgical gases in polycarbonate manufacturing, it should be clarified to what extent the impurities from the metallurgical gases influence two process steps that are important for polycarbonate manufacturing.

As a result, these two process steps are being researched and further developed to ensure the resource- and energy-efficient use of the CO.

The aim is, in particular, to research the catalytic mechanisms in the implementation of CO in order to develop catalysts/catalyst structures on this basis that are robust against impurities.

A further aim is to further develop a suitable reactor concept for a more energy- and resource-efficient process by incorporating renewable energies while integrating electrical heating into the process step that is currently being developed. A particular focus lies on guaranteeing a high product quality, which is an important prerequisite for the technical realization of polycarbonate production on the basis of converter gases.

### PROJECT CONTENT

The research into a possible use of CO from metallurgical gases from the steel industry to manufacture high-quality plastics should take place as part of the Carbon2Polymers project specifically using the example of the manufacture of polycarbonate. The project also includes a comprehensive profitability analysis and a life cycle assessment (LCA).

In the first project phase, a laboratory facility and a technical center were established and put into operation to clarify the catalytic mechanism of CO implementation.

This is an important aspect, as catalysts can react very sensitively to traces of impurities, which impairs the yields and thus the efficiency of production. In the laboratory facility and technical center, catalysts treated with metallurgical gases are tested under various conditions.

### MILESTONES

- Milestone 1 after 18 months:  
Gases that have a negative influence on a process step in PC manufacturing and must be removed were identified in a concentration of > 10 % in the CO from converter gas, and concepts were developed to remove them.
- Milestone 2 after 24 months:  
A reactor concept for the second process step in polycarbonate manufacturing was developed, and there are no critical indications that PC product qualities are impaired by impurities from the converter gas.
- Milestone 3 after 36 months:  
The use of CO from converter gas with inert gas components for polycarbonate manufacturing is possible from an ecological and economic viewpoint. The provision of CO from reforming processes, as is now standard in industrial production, forms the benchmark.

### PROJECT PARTNERS

- Covestro Deutschland AG (coordinator)
- Max Planck Institute for Coal Research
- RWTH Aachen University