

## Ten years of Carbon2Chem®: from a research project to a blueprint for a climate-neutral Industry

- CO<sub>2</sub> from steel production becomes a raw material
- Hydrogen as a renewable energy source
- Sector coupling as a systemic solution – from demonstration to scaling.
- Next step: Sustainable Aviation Fuel from Duisburg.

Duisburg, August 18, 2026 – Carbon2Chem® is currently celebrating its ten-year anniversary and stands for one of the most ambitious transformations in the industry: the consistent use of hydrogen produced from renewable sources and CO<sub>2</sub> from steel production as raw materials for the chemical industry.

**Matthias Kammel, Managing Director thyssenkrupp Carbon2Chem®, says:** *“We started with a shared vision: We view CO<sub>2</sub> and other components of blast furnace gases not as waste, but as raw materials. We use these raw materials to close carbon cycles and systematically link steel production, the energy sector, and the chemical industry. In this way, we can help reduce industrial emissions.”*

Over the course of ten years, Carbon2Chem® has evolved into a cross-industry research and development project involving more than twenty partners from industry and academia – including various thyssenkrupp companies and research institutes such as the Max-Planck-Institute for Chemical Energy Conversion and the Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT. Carbon2Chem® is funded by the Federal Ministry of Research, Technology, and Aerospace.

### Sector Coupling as a Shared Task

What began in 2016 with the groundbreaking ceremony for the technical centre (“Technikum”) in Duisburg has evolved into Carbon2Chem®, a platform for cross-sector collaboration. At the heart of this initiative is the realization that metallurgical gases contain valuable components such as carbon, hydrogen, and nitrogen – raw materials for chemical products like methanol, ammonia, and synthetic fuels.

For many years, the Technikum has served as a bridge between basic research and industrial application. It provides the foundation for investigating key process steps under real-world conditions and for the step-by-step refinement of processes. As a result, the Technical Center has provided reliable fundamentals and data over the years.

**Nadja Håkansson, COO of thyssenkrupp Decarbon Technologies and CEO of thyssenkrupp Uhde, says:**

*“Carbon2Chem® is a demonstration of a strong willingness to break new technological ground, by bringing industries and academia together to solve critical challenges for a sustainable climate, in the heart of industrial processes. Through the integration and value chains of multiple systems, CO<sub>2</sub> is utilized to create new value chains of sustainable chemicals and fuels, while reducing harmful emissions.”*

**Prof. Robert Schlögl, project coordinator for basic research:** *“The integration of steel, energy, and chemicals not only opens up avenues for reducing emissions but also helps stabilize energy systems: Renewable energy can thus be flexibly integrated into industrial processes—a contribution to system stability that extends beyond the individual site.”*

**From Demonstration to an Industrial Perspective**

As technological maturity increases, the question of scaling up is moving to the forefront. The processes developed in the project form the base for large-scale industrial applications and new business models along sustainable value chains. At the same time, the product portfolio is being continuously refined to meet the growing demand for climate-friendly chemicals and energy sources.

**Dr. Markus Oles, project coordinator for the participating industrial companies, explains:** *“Interest in carbon recycling applications is evident across all industries today. By establishing carbon as a raw material, we are sustainably strengthening economic resilience. In addition to large-scale industrial applications, innovative SMEs are also showing increasing interest in these technologies to keep carbon in the cycle in a flexible manner.”*

**Prof. Gorge Deerberg, project coordinator for applied research:** *“The experience gained over ten years with Carbon2Chem® confirms that the transformation of energy-intensive industries is feasible – when technology, partnership, and perseverance come together to shape the ongoing transformation process. This experience, based on close collaboration between basic research, applied research, and industry, also serves as an offer to the business community and the scientific community: as guidance and encouragement for similar projects.”*

**Next Steps: Hydrogen and Sustainable Aviation Fuel**

The existing electrolysis hall, which houses thyssenkrupp nucera’s pilot electrolyzer for the production of green hydrogen, will soon be expanded to include another electrolysis hall. The handover of the new electrolysis hall to thyssenkrupp nucera, planned for next year, will strengthen the hydrogen supply at the site and create an important infrastructural prerequisite for continuous industrial operation.

**Dr. Werner Ponikwar, CEO of thyssenkrupp nucera, says:** *“Carbon2Chem® has been and remains invaluable for the further development of our electrolysis technology. The site offers a unique industrial environment where new technologies can be tested under real-world conditions in practical operation and produce hydrogen. Ten years of Carbon2Chem® demonstrate how important such industrial testing and development environments are for advancing technologies toward application and scaling.”*

In parallel with the construction of the additional electrolysis hall, the green light was given for the construction of a plant to produce Sustainable Aviation Fuel (SAF) in Duisburg. This expands the use of CO<sub>2</sub> as a raw material to the aviation sector – a sector where climate-friendly alternatives are particularly urgently needed.

**Matthias Kammel:** *“Ten years of Carbon2Chem® demonstrate what is possible when industry and science work together with perseverance on a task that is larger than any single player. The next phase is beginning—with the goal of translating what we’ve learned to an industrial scale.”*

For more information see: [thyssenkrupp Carbon2Chem®: A Contribution to Climate Protection](#)

### About Decarbon Technologies

Decarbon Technologies offers innovative, cutting-edge technologies for the transition to a climate-neutral industrial economy. It includes thyssenkrupp’s businesses Rothe Erde, Uhde, and Polysius, as well as the majority stake in thyssenkrupp nucera. thyssenkrupp rothe erde is a leading supplier of large-diameter rolling bearings and offers solutions for the wind industry, among others. In this way, the company makes a significant contribution to the energy transition and decarbonization. thyssenkrupp Uhde is one of the world’s leading technology and implementation providers for large-scale chemical plants, offering solutions for decarbonization, defossilization, and the circular economy. thyssenkrupp Polysius sets standards in the climate-neutral transformation of the cement and lime industries through innovative solutions. As a leading global provider of electrolysis technology for the production of clean hydrogen on an industrial scale, thyssenkrupp nucera supports its customers on their path to climate neutrality. These businesses combine many years of experience, in-depth expertise in international plant engineering, an extensive installed base, and close customer relationships. The segment employs approximately 12,600 people (as of June 30, 2024), who generated revenue of approximately 3.4 billion euros in fiscal year 2022/2023.

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