



## CO<sub>2</sub> UTILISATION PROCESS VIA LOOPING TECHNOLOGY DEMONSTRATION

**COUPLED (CO<sub>2</sub> Utilisation Process via Looping tEchnology Demonstration) is an EU-funded project that will demonstrate a new generation of renewable fuel production by seamlessly integrating three breakthrough technologies into a single, industrially ready system (TRL7).** The project not only focuses on technical excellence, but also on safety, environmental performance, societal acceptance, policy alignment and business viability, ensuring real-world adoption across Europe's energy and industrial sectors.

At its core, COUPLED combines:

- (a) *Chemical Looping syngas generation* operated at high pressure and thermally self-sustained,
- (b) *In-situ CO<sub>2</sub> recovery* enabled by a next-generation membrane architecture, and
- (c) *Fischer-Tropsch synthesis* using a novel Fe-based catalyst in a structured reactor tailored for CO<sub>2</sub>-rich streams.

Together, these technologies aim to achieve high CO<sub>2</sub>-to-fuel conversion and reduce production costs compared with today's solutions across multiple industrial applications. When deployed at scale, COUPLED will enable refineries, biogas plants and waste-to-energy facilities to produce sustainable aviation fuels and renewable methanol, while supplying clean fuels to energy-intensive sectors such as steel manufacturing - a major step toward decarbonizing heavy industry.

The consortium brings together leading research institutes, industrial end users, catalyst suppliers, technology specialists, fuel-technology licensors and consultancy experts, ensuring strong capabilities across the entire value chain. To maximize industrial impact, COUPLED will deliver comprehensive techno-economic, environmental and societal assessments and develop a robust exploitation strategy for market uptake.

### The COUPLED Consortium

Coordinated by The University of Manchester, COUPLED unites a powerful consortium of Europe's leading industrial players and technology innovators. The partnership brings together **FINOCAS**, **SOCAR**, **CONTARINA** and **SNAM**, alongside catalyst and process leaders **Johnson Matthey** and **WOOD**, engineering specialists **TECHFEM**, and component manufacturers **IMI**, **HELICAL** and **ZEFIRA**. Research excellence is ensured by The **University of Manchester** and **TECNALIA**, who contribute essential intellectual property and scientific leadership. The consortium is further supported by **PNO**, **ETAM** and **INNSIGHT** for business development, sustainability assessment and stakeholder engagement across the hydrogen, CCUS and biofuel ecosystems.



The kick-off meeting, held on 19 November 2025 in Manchester and hosted by The University of Manchester, provided the ideal setting for partners to align on the project vision, discuss the detailed work plan and set the next steps that will drive COUPLED forward over the coming years.

