

Press release

**e-CODUCT Horizon Europe Project:
INNOVATIVE PILOT REACTOR LAUNCHED IN SLOVENIA TO DRIVE FORWARD INDUSTRIAL
DECARBONISATION**

Opening of a novel electrothermal fluidised bed reactor



Photo 1: Pilot-scale ETFB reactor, located in Reactor Center Podgorica, Ljubljana, Slovenia

Ljubljana, Slovenia - 8 April 2025 – The Horizon Europe-funded e-CODUCT project has reached an important milestone with the launch of its novel ElectroThermal Fluidized Bed (ETFB)-reactor pilot in Ljubljana, Slovenia. This milestone is an important step towards developing a sustainable solution for reduction of greenhouse gases and decarbonisation of industry in line with the European Green Deal.

The e-CODUCT pilot unit which is installed at the Reactor Center Podgorica (Institute Jožef Stefan), was developed to simultaneously utilize acid gas components (CO_2 and H_2S), by converting them into an intermediate, carbonyl sulfide (COS), and then into valuable chemicals, sulphur (S) and carbon monoxide (CO). The latter is hydrogenated into methanol. This pilot line was developed and manufactured under the supervision of the Centre of Excellence Low Carbon Technologies (CO NOT) and the Department of Catalysis and Chemical Reaction Engineering at the National Institute of Chemistry (NIC), partners of the e-CODUCT project.

Pilot line features the first electrified fluidized-bed reactor unit of its kind. Utilizing electrothermal catalysis, the e-CODUCT technology enables the pilot reactor to quickly and efficiently deliver concentrated heat locally, allowing to reach temperatures in the reactive zone up to 1200 °C. Such heat delivery unlocks the potential of efficiently carrying out highly endothermic reactions that require immense amounts of heat. This offers significant environmental and economic benefits for various industrial sectors, including petrochemicals, biogas production and the energy sector, and facilitates cross-sector collaboration and sustainable business opportunities.

Joris W. Thybaut, Ghent University, e-CODUCT coordinator: *“Both elemental sulfur and CO are important intermediates in the chemical industry with many daily-life applications ranging from pharmaceuticals over paints to tires. Compared to currently existing gas treatment processes, the e-CODUCT technology is better integrated and, hence, more efficient. Moreover, thanks to the ETFB reactor which has been inaugurated today, e-CODUCT will rely on renewable electricity and the technology is developed to rapidly respond to variations in availability of electricity. In summary, with e-CODUCT we’re realizing a triple win: thanks to renewable energy, e-CODUCT will employ a greenhouse gas to convert a toxic component into useful chemicals”.*

DEVELOPMENT AND FABRICATION OF A NOVEL ELECTROTHERMAL FLUIDISED BED REACTOR

The launch of the pilot reactor is an example of the effectiveness of innovation and collaboration in tackling critical environmental challenges. Once the project partners had agreed on a concept based on innovative research into e-CODUCT technology, a number of subcontractors took on key roles in the detailed engineering and fabrication of the pilot line. These subcontractors include Thermal and Material Engineering Centre sp z.o.o. (Poland), which supervised the detail engineering of the ETFB reactor, CPPE, d.o.o. (Celje, Slovenia), which managed the detailed engineering of the entire pilot line and its fabrication; and Colbyco, d.o.o. (Ljubljana, Slovenia), which was responsible for process control and data acquisition, among other things. All activities were coordinated and monitored by researchers from CO NOT and NIC.

FUTURE PROJECT ACTIVITIES

One of the most important goals in the development of the e-CODUCT project is to demonstrate the technology on a larger scale. The experimental data collected in the pilot unit will be used in a comprehensive techno-economic model that will show the technology's advances and prove that the e-CODUCT technology is a promising solution for a more sustainable and circular economy.



Photo 2: e-CODUCT project partners at the 30M General Assembly meeting 7-8th of April 2025 in Ljubljana, Slovenia.

The e-CODUCT project was launched in September 2022 and brings together nine leading European research institutions and industry partners from five European countries (Belgium, Slovenia, the Netherlands, France and Germany). The aim is to create a sustainable solution for greenhouse gas mitigation. The e-CODUCT project is coordinated by Ghent University and funded under Horizon Europe Grant Agreement n°101058100.

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