SPIRE First Newsletter

TITLE: *The kick-off meeting of the new project ICO2CHEM was held in Frankfurt on November 30th and December 1st, 2017. The project aims to convert industrial CO_2 streams to value added Fischer-Tropsch chemicals.*

The new project ICO2CHEM got started! The project is part of the SPIRE projects portfolio. SPIRE is the European Public-Private Partnership dedicated to innovation in resource and energy efficiency enabled by the process industries. The kick-off meeting took place on November 30th and December 1st, 2017 in Frankfurt at the Industriepark Höchst, where the Fischer-Tropsch pilot plant converting CO_2 to raw materials for chemicals will be installed.

The aim of the ICO2CHEM project is indeed to develop a new production concept for converting waste CO_2 to value added chemicals. The focus is the production of white oils and high molecular weight aliphatic waxes. The technological core of the project consists in the combination of a Reverse Water Gas Shift (RWGS) reactor coupled with an innovative modular Fischer-Tropsch (FT) reactor.

The project is conducted by the joint effort of 6 EU partners: VTT from Finland, Altana, Ineratec, Infraserv, Provadis Hochschule from Germany and Politecnico di Torino from Italy.

Read more here (News linked to the Spire/ICO2CHEM web site)

FULL TEXT

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Context

The EU agenda on energy foresees the decarbonization of the energy system. One of the implementation actions of the EU Integrated Strategic Energy Technology (SET) Plan focuses on carbon capture and sequestration (CCS) and (re-)use (CCU) technologies. While CCS is well-established from a technological point of view, the underlying paradigm is still that of treating the carbon dioxide emission as a waste, which is to be disposed of. Reutilization, instead, attempts to add value to CO_2, which becomes a commodity for a new generation of synthetic fuels and chemicals that will displace their fossil-based counterparts.

ICO2CHEM specifically address a possible CCU pathway by catalytically converting CO_2 into chemicals. The project is funded within the call SPIRE08-2017 'Utilisation of CO2' together with two sister projects – Carbon4PUR (Turning industrial waste gases into intermediates for polyurethane plastics for rigid foams/building insulation and coatings) and Recode (Recycling carbon dioxide in the cement industry to produce added-value additives: a step towards a CO_2 circular economy).

The application

Within ICO2CHEM, a containerized chemical pilot plant will be installed and operated at the InfraServ Höchst Industrial Park in Frankfurt, Germany. The pilot plant will convert CO_2 from a biogas upgrading plant together with industrial H_2, a by-product of a chloro-alkali electrolyzer plant, into highly valuable white oils and high molecular weight aliphatic waxes. The pilot plant consists of innovative RWGS and FT reactors, supplied by INERATEC. The RWGS step will convert CO_2 with H_2 into a synthesis gas mixture. The following FT reaction step will convert the synthesis gas into the chemical products. The FT reactor will be equipped with a novel Co-based catalyst with enhanced selectivity and lifetime, supplied by VTT. The project partner Altana will utilize the white oils and wax emulsions as a raw material for chemical products, such as coatings and sealant materials, and benchmark the properties of the raw material against the fossil-based material.
ICO2CHEM not only foresees at developing a novel feasible CO_2 economic route but also enlightening further knowledge about the entire process as well as the FT catalyst. The project coordinator VTT will develop a novel Co-based catalyst with enhanced selectivity for specific synthetic hydrocarbons.

The consortium

The project is conducted by the joint effort of 6 EU partners. Coordinator: VTT (FI). Project partners: Ineratec (DE), Altana (DE), Infraserv (DE), Provadis Hochschule (DE) and Politecnico di Torino (IT).