

Press release

Ecological Transition and Digital Transformation: Itelyum inaugurates the Permanent Demonstrative Laboratory (PDL) in collaboration with Politecnico of Milan

Experiment to apply innovative technologies: hydrogen and lubricants from plasmix and 'Acid Gas to Syngas' to transform carbon dioxide and hydrogen sulphide into hydrogen and lubricants, Digital Twin to simulate plant operation.

Pieve Fissiraga (LO) 21 July 2022 - Itelyum and the Politecnico of Milan have launched the 'Permanent Demonstrative Laboratory (PDL)' at the Itelyum Regeneration plant in Pieve Fissiraga (LO).

With the ribbon-cutting ceremony, Managing Director Marco Codognola, Operations Director Francesco Gallo, together with CMIC Director MariaPia Pedeferri, TTO Director Ivano Ciceri and Professor of Plant Engineering Flavio Manenti created a place where academic research and industrial development meet to fertilise technological innovation by developing applications related to the circularity of resources.

'Itelyum is focused on the development of solutions that will enable the energy transition,' explains CEO and managing director Marco Codognola, 'including the sustainable production of advanced biofuels, biochemicals and carbon dioxide recovery. With the Milan Polytechnic, we have been working for several years on a path of research and innovation, for the creation of new technologies, decisive factors in ensuring an increasingly circular and sustainable future. This collaboration, which has already led to the development of patented solutions realised in our plants, will receive a decisive boost with the creation of the joint laboratory, which will host both researchers from the Politecnico and engineers from Itelyum'.

Innovative technology

The Acid Gas to Syngas technology enables the conversion of hydrogen sulphide and carbon dioxide into synthesis gas. The importance of this reaction lies in the valorisation of two polluting compounds with little economic influence, in energy self-sufficiency and without any further exploitation of (fossil and renewable) resources. The technology finds application in both fossil (gas fields,

refineries, shale, coal gasification) as well as renewable (geothermal, biomass, biogas), offering a new avenue for carbon dioxide and hydrogen sulphide.

Hydrogen sulphide and carbon dioxide together can be converted without any use of resources, fossil or renewable, to produce a hydrogen- and carbon monoxide-rich mixture (syngas) that is the basis for the production of advanced chemicals and biofuels.

The new laboratories of the Politecnico di Milano and Itelyum Regeneration at Pieve Fissiraga (LO) allow the performance of the technology to be verified and optimised directly in the field.

The new laboratory will also study Plastbreaking technology for the transformation of non-recyclable plastics (plasmix) into hydrogen and lubricants using conventional processes.

In addition, the use of advanced simulation software will allow the creation of the digital twin of the existing plant using real information and developing high-performance process simulators for energy efficiency.

In an era of energy and ecological transition, this experience can be applied to cleaner uses of fossil sources, such as coal gasification, coke oven gas, shale oil, shale gas, general oil & gas, and oil & gas fields, as well as to renewable sources such as biomass, biogas, geothermal and green hydrogen generation. Gas in general and gas fields, but also to renewable sources such as biomass, biogas, geothermal energy and green hydrogen generation, as well as to areas of basic chemistry such as low-impact syntheses of ammonia, synthetic fuels (e- and bio-fuels), methanol and dimethylether in primis.

"The Permanent Demonstrative Laboratory," says Professor Flavio Manenti, "will make it possible to study and understand new phenomena and reactions that would otherwise not be easily possible in normal academic facilities, unless large investments, long set-up times and security systems are required that are difficult to implement nowadays.

'The laboratory,' adds Manenti, 'is also able to foster the technological maturation of new ideas and technologies through direct interaction with the field and the circular chemical plant at Itelyum, thus providing a further tool for technological advancement and acceleration for the entire national academic system.