

### THE INCITE PROJECT

## A ROADMAP TO A SUSTAINABLE AND COMPETITIVE FUTURE FOR THE EUROPEAN CHEMICAL INDUSTRY

A.SPIRE and the European Commission shaped the call within the frame of the SPIRE partnership, mirroring the aims of the European Union towards sustainability and competitiveness and the necessities of the process industries.



2017

2018  
June

The idea of the project was first presented by VITO (project partner and A.SPIRE member) at the A.SPIRE Brokerage 2018 event organised at Achema in Frankfurt.

The idea presented at the Brokerage event was well received, and a consortium of seven European partners was formed. The partners submitted their project proposal.

2019

2019  
Sept

On the 1st of September, the SPIRE project INCITE (Innovative Chemoenzymatic Integrated Processes) was launched - under the coordination of the A.SPIRE member OLEON NV - aiming to reshape the future of the chemical industry.

The innovative technology developed during the project reached TLR7, and in June 2023, a demo plant was inaugurated on OLEON facilities in Oelegem, Belgium, under the slogan ENZYMES FOR THE FUTURE. Thus, a brand-new factory model was invented.

2023  
June



2023  
Dec

The end of the project.  
"The INCITE project throws the first stone to a transition from the conventional oleochemical to the enzymatically based process for a part of our portfolio." (OLEON)

Check out the project's website:  
<https://www.project-incite.eu/>

## CONTEXT

In the past two decades, the need for alternative environmental preserving technologies and practices has become increasingly acute due to the climate challenges we face. The chemical industry is an essential player in this process, as chemical ingredients are used in a large variety of everyday products, and producing them has a significant environmental impact.

## PROJECT GOALS

Starting from this premise, the INCITE project aimed to demonstrate novel integrated upstream and downstream processing paths involving flow chemistry and membrane technology in chemo-enzymatic processes under the slogan Mimicking nature could lead to greener processes for production of novel chemicals. The project - fully aligned with the Processes4Planet SRIA 2050 - was implemented by a consortium of seven European partners.

## ENZYMES FOR THE PLANT OF THE FUTURE ONE STEP CLOSER TO MARKET DEPLOYMENT

The disruptive technology proposed by INCITE employs the great potential of enzymes paired with greener industrial processes in chemical production, hence creating the chemical factory of the future. The novelty harbours the capacity to manufacture a larger volume and variety of products while producing less waste, thus bringing the chemical industry closer to the net-zero emissions goal. INCITE also established the methodology to teach and train current and future workers, developing the skill set required for the new technology to be used at full capacity.



The innovation was implemented in an oleochemical demo in Belgium. The inauguration took place on the 15th of June 2023 and it was a great success. The demonstrator has a capacity of 2000 T/ year production of everyday chemical ingredients. A sister agrochemical demo plant is up and running in Bologna, Italy.

## RESULTS AND POTENTIAL IMPACT

According to OLEON, the development of enzymatic catalysis for esterification has translated into an average carbon footprint (CFP) reduction of 20 to 35% in the Belgium plant. This is a result of switching to biocatalysis, which is linked to a decrease in energy consumption, improved yield, and better management of process wastes compared to a conventional oleochemical process.

Additionally, the demo plant prevents more GHG emissions from being emitted. Raw material consumption is the main driver for CFP reduction through the seriously improved yield (no losses during the purification step, alcohol recuperation through pervaporation). This, paired with the reduced energy consumption due to lower temperature processes and reduced waste streams, generates a reduced cradle-to-gate climate change impact of 13% CO<sub>2</sub> equivalents.



Regarding the demo plant, OLEON experts stressed a decrease of 43% in CO<sub>2</sub>eq emission for the enzymatic process compared to the standard one. Furthermore, they accentuated that switching to enzymes as catalysts for the esterification processes helped remove the dangerous aspect and negative environmental impact of classic chemical catalysts, usually considered harsh chemicals. In the case of a complete switch of process from chemical to enzymatic, several metric tonnes of harsh chemicals would be prevented from being used - a positive environmental impact and a notable increase in work safety.

**A.SPIRE considers the INCITE project (developed under the SPIRE Partnership) a success story and an inspiring saga where a groundbreaking innovation was implemented in a demo plant able to deliver a game-changer industrial scale demonstrator given the proper support to prove its economic and technological feasibility.**



**A synergy between vision and EU funding to "foster competitiveness for a sustainable European chemical industry". We are looking forward to seeing the next steps in this European success story.**

**If you want to learn more about A.SPIRE and the current Partnership - P4Planet, check the [A.SPIRE website](#) or contact the [team](#).**

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