

## A.SPIRE

Post date:

29/02/2024 - 18:06



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**The INCITE Project**

## **A roadmap to a sustainable and competitive future for the European chemical industry**

**The INCITE project** (Innovative Chemoenzymatic Integrated Processes) was launched on the 1st of September 2019 and ended on the 31st of December 2023. It was funded by the Horizon 2020 Programme under the **SPIRE** contractual Public-Private Partnership (active between 2014 and 2020). The project was implemented by a consortium of seven partners under the coordination of the **A.SPIRE's** member **OLEON**.

### **Project goals**

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's objectives are **fully aligned with the Processes4Planet SRIA 2050.**

### **Enzymes for the plant of the future**

The innovative technology developed during the project reached **TLR7**, and in **June 2023**, a demo plant was inaugurated on **OLEON NV** facilities in **Oelegem, Belgium**, under the slogan ***ENZYMES FOR THE FUTURE.*** It has a capacity of **2000 T/ year production of everyday chemical ingredients.**

### **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.

Check out the **document** for more details on this success story.

More information on the INCITE project from A.SPIRE's member VITO **here**.

If you want to learn more about A.SPIRE and the current Partnership - Processes4Planet, contact the **team**.