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REDUCING CARBON EMISSIONS BY OPTIMISING THE CO_2 HYDROGENATION TO PRODUCE GREEN METHANOL

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Green renewable methanol to reduce carbon emissions in the transport sector

Responsible for more than 25% of the EU's greenhouse gas emissions, the **transport sector** is key in achieving the ambitious objective of making the EU **the world's first climate neutral continent by 2050.** To decarbonise the transport sector and replace the current dependence on fossil fuels, **new alternative renewable fuels technologies** are being developed.

LAURELIN focuses on **methanol production from CO_2 hydrogenation**, a reaction between **renewable raw materials**, hydrogen (H_2) and CO_2 which produces methanol and water. This process **reduces carbon emissions by up to 95% compared to conventional fuels**, one of the highest potential reductions for alternative fuels. It results in a low carbon renewable fuel for several transport modes, and in capturing the CO_2 emitted by other industrial activities.

Gathering "Green Chemistry" experts from Europe and Japan, LAURELIN will **develop innovative solutions to improve green methanol production from CO_2 hydrogenation in terms of energy efficiency and production cost.**

Four years to optimise green methanol production from CO_2 hydrogenation

Hydrogenation of CO_2 into methanol currently has strong limitations related to the process, the energy consumption and production costs. Besides, given that H_2 is generally unreactive, hydrogenation is impossible without the use of a catalyst, a substance added to accelerate the chemical reaction of H_2 with CO_2.

The main objective of the LAURELIN project is to reduce energy consumption of the methanol synthesis from CO2 by developing new catalyst systems perfectly adapted to advanced reaction technologies: microwave, magnetic induction and non-thermal plasma.

LAURELIN will:

- Develop and validate new energy-supplying technologies (microwave heating, plasma and magnetic induction) for CO_2 hydrogenation to renewable methanol;
- Develop innovative catalysts for each of these technologies, while minimising energy requirements;
- Develop three "proof-of-concept" laboratory prototypes for the energy-supplying technologies and catalyst developed;
- Compare the efficiency of new catalysts with conventional thermal hydrogenation;
- Monitor performance indicators (overall yield, greenhouse gas emissions and manufacturing costs).

MAIN INNOVATIONS