Sterope

From industrial CO_2 to clean fuels for aviation and maritime transport

STEROPE demonstrates an integrated CCU (Carbon Capture and Utilisation) value chain at real refinery scale, converting industrial CO_2 into advanced renewable fuels through innovative capture, catalytic conversion and green hydrogen integration.







STEROPE (Synergistic Advanced Carbon Capture Technologies for ConvERsion of Industrially Emitted CO_2 to sustainable Production of biofuels and chEmicals) is a Horizon Europe RIA addressing decarbonisation challenges in hard-to-abate industrial sectors. It converts industrial CO_2 emissions into renewable e-fuels and chemical intermediates, accelerating EU climate neutrality and circular economy goals.

OBJECTIVES

- Demonstrate integrated and sustainable CCU value chains at refinery scale
- Enable efficient CO_2 utilisation aligned with circular economy principles
- Support deployment of advanced renewable fuels for aviation and maritime
- Strengthen industrial symbiosis and reduce emissions in hard-to-abate processes

CONCEPT & TECHNOLOGY

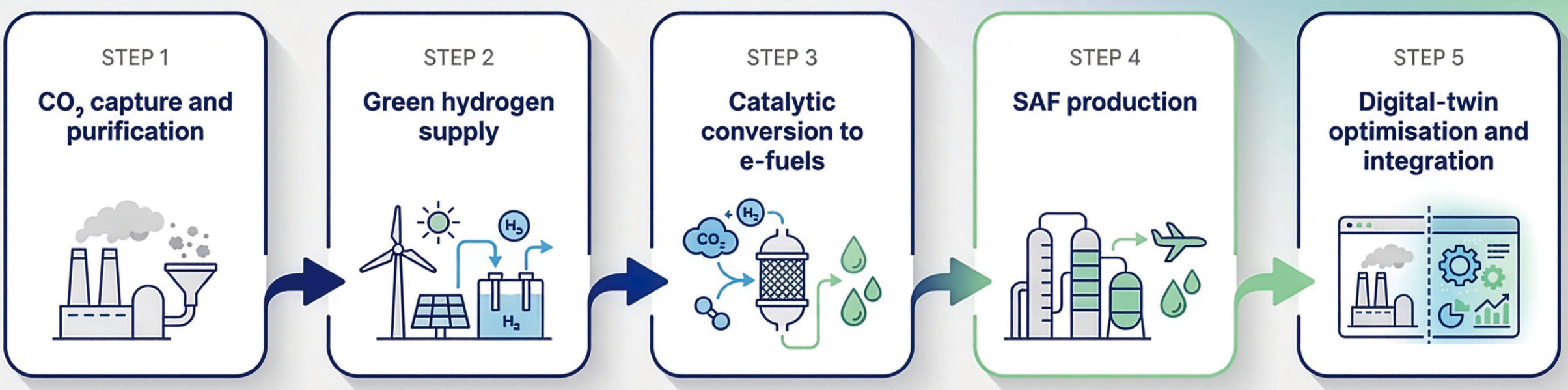
STEROPE integrates cutting-edge carbon capture, purification, catalytic conversion, and green hydrogen integration to build a first-of-a-kind TRL 7 CCU system operating under real refinery conditions.

The process maximises renewable fuel production efficiency with digital-twin optimisation and industrial integration.

IMPACT

- Significant industrial CO_2 emissions reduction by converting to renewable fuels.
- Acceleration of low-carbon solutions for aviation & maritime sectors.
- Reinforcement of EU competitiveness via circular and integrated processes.
- Contribution to Europe's climate neutrality and energy transition goals.

VALUE CHAIN / PROCESS FLOW



EXPECTED IMPACT

Avoid more than 3.5 million tonnes of CO2 per year

Decarbonising hard-to-abate sectors
High mitigation potential
Long-term economic impact
Boosting EU technological leadership

Strong contribution to EU climate and energy goals
Industrial symbiosis & new revenue streams
Strategic innovation impact
Advancement of technology readiness

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Funded by the European Union

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