



From industrial CO₂ to clean fuels
for aviation and maritime transport



Scaling integrated CCU at refinery scale
to accelerate Europe's climate-neutral transition.



Funded by
the European Union

DECARBONISING HARD-TO-ABATE SECTORS



Led by HELLENiQ ENERGY's Eleusis Refinery, STEROPE brings industrial leadership to the development of next-generation Carbon Capture and Utilisation (CCU) solutions.

Energy-intensive sectors such as refining, chemicals and heavy transport remain among Europe's largest sources of CO₂ emissions. Even with electrification and renewable energy integration, process emissions persist.

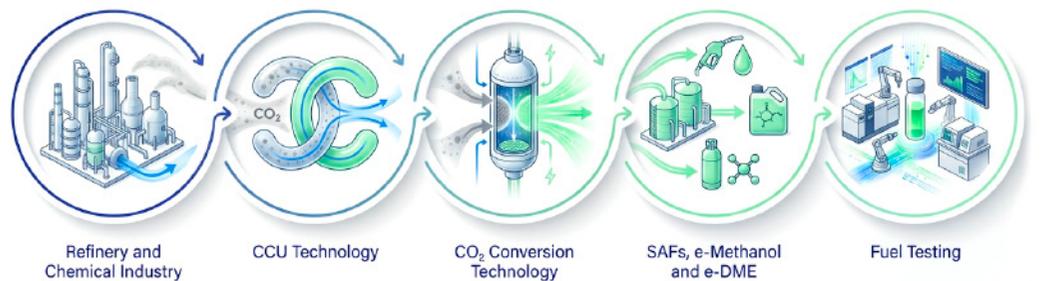
Achieving climate neutrality by 2050 requires scalable, economically viable and circular solutions that operate under real industrial conditions transforming CO₂ from a liability into a strategic resource.

THE STEROPE SOLUTION

STEROPE demonstrates a first-of-a-kind integrated Carbon Capture and Utilisation (CCU) value chain operating at refinery scale.

The project converts industrial CO₂ emissions into advanced renewable fuels and chemical intermediates through innovative capture technologies, catalytic conversion and green hydrogen integration.

Operating at TRL 7 under real refinery conditions, STEROPE bridges the gap between pilot innovation and full industrial deployment.



KEY OBJECTIVES

The main objective of STEROPE is to demonstrate the conversion of industrial CO₂ emissions into sustainable fuels for aviation and maritime transport

Demonstrate integrated CCU value chains at refinery scale



Enable efficient and circular CO₂ utilisation



Foster industrial **symbiosis and reduce** hard-to-abate emissions



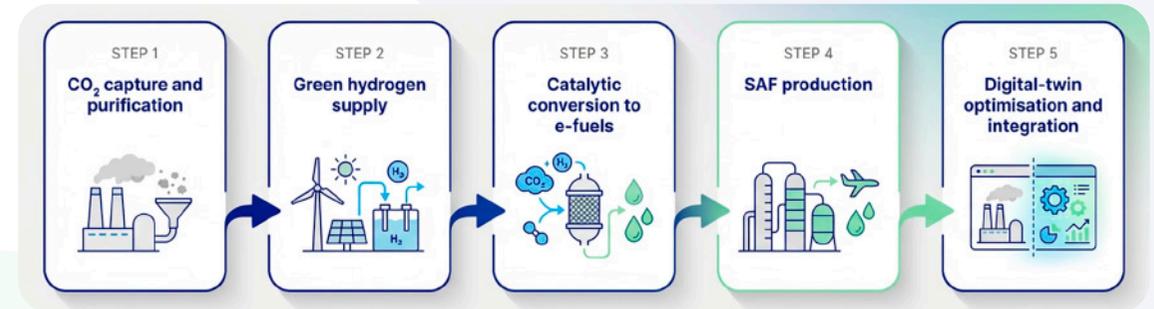
Deploy advanced renewable fuels for aviation and maritime

CONCEPT & TECHNOLOGY

STEROPE integrates cutting-edge carbon capture, purification and catalytic conversion technologies within an optimised industrial process architecture.

Green hydrogen enables the synthesis of renewable e-fuels, while digital-twin optimisation maximises system efficiency, robustness and operational integration.

The result is a scalable, modular and replicable CCU system ready for industrial uptake.



EXPECTED IMPACT

> 3.5 million tonnes of CO₂ avoided per year

Large-scale reduction of industrial CO₂ emissions

Reinforcement of EU industrial competitiveness and energy resilience

Acceleration of low-carbon fuel deployment for aviation and maritime sectors

Contribution to the European Green Deal and climate neutrality targets

Sterope

sterope-project.eu



info@sterope-project.eu



CERTH
CENTRE FOR
RESEARCH & TECHNOLOGY
HELLAS



Università
di Genova



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