ALIGN CCUS

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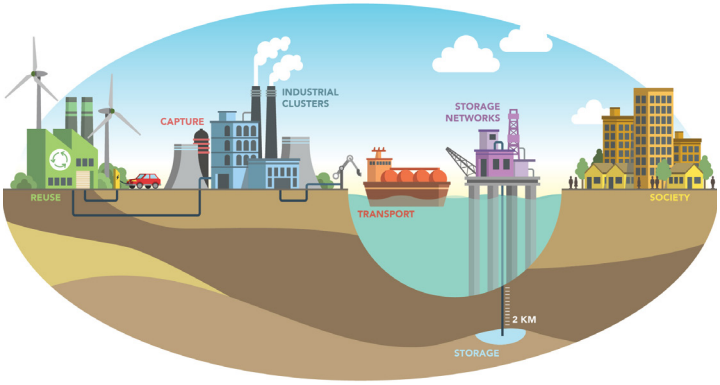

The international ALIGN-CCUS project unites science and industry in the shared goal of transforming Europe's industrial regions into economically robust, low-carbon centres by 2025.

Our partnership of 31 research institutes and industrial companies from five countries has secured European and national funding for carrying out interlinking areas of research into capturing, utilising and permanently storing carbon dioxide (CO_2).

By exploring specific issues faced by industry, we aim to support the quick and cost-effective deployment of carbon capture, utilisation and storage (CCUS), enabling Europe's industrial and power sectors to become part of a low-carbon future while remaining economically viable.

Our three-year project, which draws on considerable expertise from the project's partners, will focus on:

- Optimising and reducing the costs of CO_2 capture technology
- Planning large-scale CO_2 transport
- Providing sufficient and safe offshore CO_2 storage
- Developing the use of CO_2 in energy storage and conversion
- Supporting the social acceptance of CCUS

The project's technical research will make use of existing pilot and demonstration projects, which are in various phases of development. It will also focus on real-life industrial clusters, where companies have already identified CCUS as a key technology for reducing the environmental footprint of their operations.

A low-carbon transformation

The combined results of our research will be used to provide five industrial regions in Europe with blueprints to support and accelerate the delivery of low-emission industry clusters through CO_2 geological storage and CO_2 utilisation.

The project will also provide a portfolio of storage options for each cluster, along with advice on securing storage permits and planning future capacity.

North Rhine-Westphalia, Germany

Germany's most populated state is a focal point for industry and energy production, including many manufacturing industries and lignite-fired power plants. We will evaluate carbon capture and utilisation as a means of tackling CO_2 emissions across the region.

Oltenia, Romania

The blueprint for this region will identify the most feasible CO_2 transport routes for future captured CO_2 from Oltenia's industrial cluster, and will investigate suitable storage options, including the use of CO_2 in enhanced oil recovery.

Rotterdam, the Netherlands

Rotterdam Port has five large refineries, production plants for hydrogen, industrial gases and chemicals, fossil fuel power generation and waste incineration. Our research will support plans for a "hub" for decarbonising natural gas together with offshore CO_2 storage.

Grangemouth, United Kingdom

The focus of this cluster is a refinery complex for chemical products and Scotland's only crude oil refinery. It is the proposed site for Summit Power's Caledonia Clean Energy Project. We will identify possible cost reductions through shared infrastructure and optimised CO_2 transport and storage.

Grenland, Norway

Norcem's cement plant and Yara's ammonia plant are the region's largest CO_2 sources. Together with EGE's waste incineration plant in Oslo, they have been identified as ideal for CCUS. Our project will provide plans for an CO_2 surface storage facility.

Teesside, United Kingdom

The Tees Valley is one of the UK's most densely clustered sites of manufacturing industries. Future plans include "clean hydrogen" production using CO_2 capture and storage. Our project will build on previous studies to identify cost reductions through shared transport and storage infrastructure.

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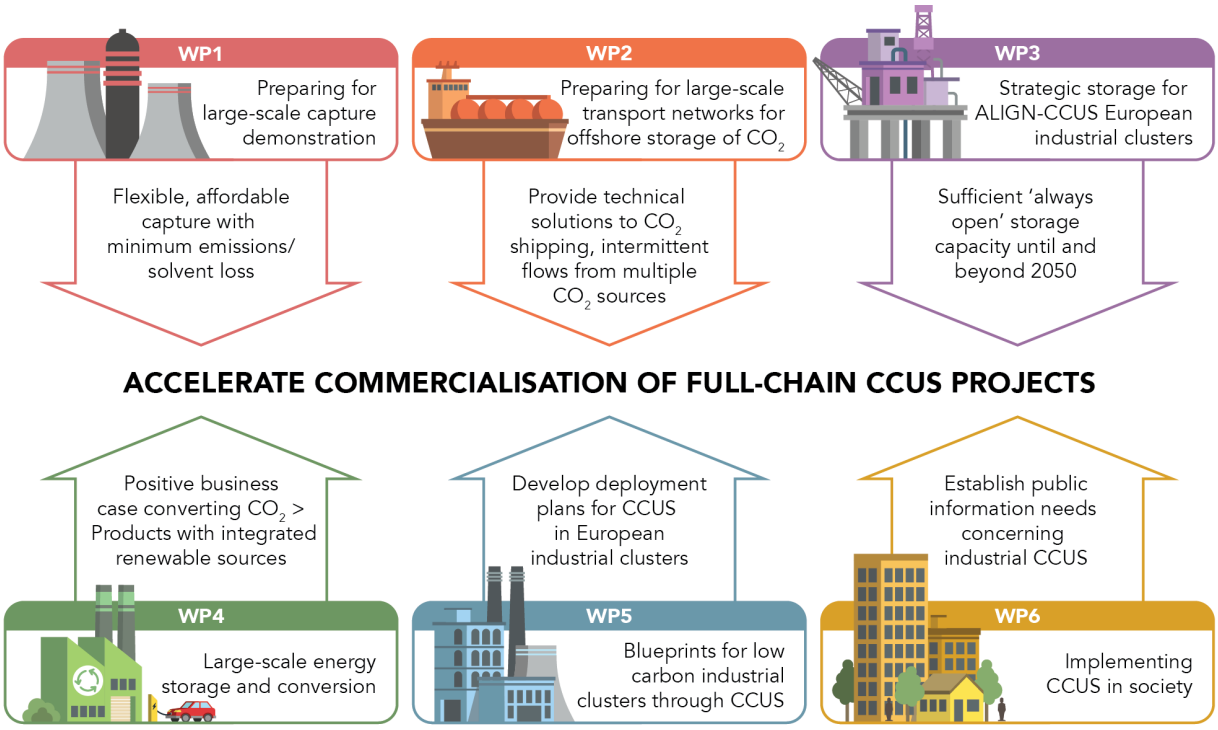
Accelerating low-carbon industrial growth through CCUS



Preparing for large-scale capture demonstration: Research will focus on accelerating the market readiness of CO_2 capture technology for both power and industrial applications. Testing campaigns on post-combustion capture technology will be carried out at cutting-edge European research facilities to improve environmental and economic performance.

Preparing for large-scale transport networks for offshore storage of CO_2: Modelling studies will aim to reduce uncertainties in technical feasibility, cost and the safety of marine CO_2 transport and injection into offshore geological formations, and create guidelines for developing flexible transport and storage networks.

Strategic storage for ALIGN-CCUS European industrial clusters: The project will develop a unique readiness assessment protocol to define future CO_2 storage capacity and reduce uncertainty around the provision of large-scale storage networks. Research will also focus on enhanced characterisation of North Sea CO_2 storage and the re-use of existing oil and gas infrastructure transport and storage for ALIGN-CCUS industrial clusters.

Large-scale energy storage and conversion: Work will focus on designing, constructing and operating a first-of-a-kind, full-chain CO_2 capture and conversion project in an industrial environment. This will aim to demonstrate to the wider public the value and benefits of CCUS within an integrated energy system.

Blueprints for low-carbon industrial clusters through CCUS: Six industrial clusters across five European countries will be the focus of targeted full-chain CCUS research, addressing specific issues identified by industry. The results will then be used to provide delivery blueprints for each region.

Implementing CCUS in society: Achieving public support for CCUS is a key challenge and this work will measure and identify conditions which would enhance this support. Innovative basic and applied research will be used to develop tools that CCUS stakeholders can use to de-risk proposed plans for industrial CCUS.

Accelerating CCS Technologies

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