ALIGN CCUS: an ERA-NET ACT project on the full CCUS chain to accelerate implementation of decarbonisation in industrial areas

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Keywords: Industrial clusters, Full Chain CCUS, Capture, Transport, Storage, Utilisation, Public perception

Abstract
ALIGN CCUS (Accelerating Low CarboN Industrial Growth through CCUS) is a project from the first ERA-Net Cofund ACT program. In this program nine European countries, together with the H2020 program are joining forces and making funds available for research and innovation actions related to CO₂ Capture and Storage (CCS). The initiative is called ACT – Accelerating CCS Technologies. The participants of ALIGN CCUS represent the ERA-NET ACT countries of The Netherlands, Germany, Norway, Romania and the United Kingdom. The ALIGN CCUS consortium involves 31 partners from industry, research and academia and has considerable involvement of industrial companies. The industrial partners are not only guiding the research, but have committed to directly investing in the R&D and demonstration activities in the project, boosting the credibility of the project’s potential for accelerating and maturing CCUS technologies.

The ALIGN CCUS (ALIGN) project aims to accelerate the transition of current industry and power sectors into a future of continued economic activity and low-carbon emissions, in which carbon capture, utilisation and storage (CCUS) plays an essential role. ALIGN addresses specific issues across the CCUS chain for industrial regions in ERA-NET ACT countries, enabling large-scale, cost effective implementation of CCUS by 2025. To reach the overall aim of ALIGN, the project encompasses a number of focused but interlinked objectives:

1. Capture: Enable near-term¹ deployment of CO₂ capture by improving performance and reducing costs
2. Transport: Optimising large-scale CO₂ transport
3. Storage: Reduce uncertainty in the provision of large-scale storage networks
4. Utilisation: Establish the contribution of CCUS as an element for large-scale energy storage and conversion
5. Social acceptance: Implementing CCUS in society

ALIGN’s objectives are designed to enable the acceleration of CCUS in specific industrial regions in ERA-NET ACT countries: Teesside and Grangemouth (UK), Rotterdam (NL), North Rhine-Westphalia (DE), Grenland (NO) and Oltenia (RO). ALIGN will combine the results from each of

¹ Near-term here is defined as CCUS projects that could be constructed prior to 2025.
these objectives to deliver actionable blueprints in each region, in which CCUS enables low-emission industries, through geological storage and/or utilization of CO₂.

The project contributes to advancing the TRL levels of CCUS technologies through long-term CO₂ capture testing campaigns at leading EU research facilities, and the design, construction, operation and testing a first-of-a-kind full-chain CO₂ capture and conversion project in an industrial environment. A unique CO₂ storage readiness assessment protocol shall be established to accelerate the definition of CO₂ storage capacity, and potential storage locations in the North Sea will be better characterized. ALIGN also contributes to societal acceptance issues of CCUS. For the first time, leading social scientists will conduct quantitative research to understand how public perception of CCUS varies depending upon the source of CO₂. The scientific outcomes of ALIGN will contribute directly to the acceleration of CCUS deployment in EU industrial regions, overcoming cluster specific technical challenges.

The paper will present in detail the organisation and objectives of the project, the expected outcomes and the impact and results to be obtained. The paper will show the connection between the different work packages and how the information exchange between the work package will lead to a unique approach towards the development of blue prints for the decarbonization of industrial clusters that are not only applicable in the regions identified in ALIGN CCUS but anywhere in Europe and worldwide.

Acknowledgement
ACT ALIGN CCUS Project No 271501
This project has received funding from RVO (NL), FZI/PtJ(DE), Gassnova(NO), UEFISCDI (RO), BEIS (UK) and is cofounded by the European Commission under the Horizon 2020 programme ACT, Grant Agreement No 691712
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