European Commission

OTHER ENERGY INTENSIVE INDUSTRIES

INNOVATION FUND

Deploying innovative net-zero technologies for climate neutrality

CFCPILOT4CCS: CFC Pilot for CCS

The Innovation Fund is 100% funded by the EU Emissions Trading System

| Project Factsheet

Carbonate Fuel Cells Pilot for Carbon Capture and Storage

The project aims to develop an innovative decarbonisation solution by using Carbonate Fuel Cells (CFCs) to capture CO2 from dilute industrial streams. The underlying Fuel Cell technology has already been commercialised for power generation. Within the CFCPILOT4CCS project, the technology will be piloted in Rotterdam to further develop and adapt it for CO2 capture at an industrial scale. The expected CO2 capture and storage of the pilot plant could result in a relative emission avoidance of 78%, based on Innovation Fund methodology.

The CFCPILOT4CCS project aims to obtain data on performance and operability to improve the CFC technology and address technical issues that occur in a commercial environment. Additionally, it aims to better understand the costs of installing and operating a CFC plant for carbon capture. The pilot project is also planning to achieve about 46 000

COORDINATOR
ESSO NEDERLAND BV

LOCATION
Netherlands

CATEGORY
Energy intensive industries (EII)

SECTOR
other

AMOUNT OF INNOVATION FUND GRANT
EUR 30,497,000

EXPECTED GHG EMISSIONS AVOIDANCE
45,689 tonnes CO2 equivalent

STARTING DATE
01 April, 2023

ENTRY INTO OPERATION DATE
31 March, 2026

FINANCIAL CLOSE DATE
31 December, 2024

** Calculated vs. the 2021-2025 ETS benchmark of 6.84 tCO2e/tH2, not taking into account additional carbon abatement due to substitution effects in the H2 end use application, i.e. conservative estimate.*

tonnes CO2 equivalent of greenhouse gas avoidance during its operation.

CFCs are differentiated from other commercially available technologies due to their unique ability to generate electricity, hydrogen and useful heat while capturing CO2. This feature increases the overall efficiency of the capture process and provides additional value streams that reduce the effective cost of carbon capture and storage. CFC technology is also modular, which enables more economical carbon capture at small and medium scales, compared to other commercial technologies, such as amine-based capture that has been developed for larger applications. Application of this technology at large scale will be enabled by increased market demand and associated volume-based manufacturing cost reductions of CFC modules. The unique features of the CFC technology increase the attractiveness of carbon capture projects and make such projects more accessible for widespread industrial application. The European Commission roadmaps towards 2030 and 2050 identified carbon capture and storage as a central low carbon technology and wider industrial application of the CFC technology would contribute to the EU's 2050 Greenhouse Gas emission reduction objectives.

When the CFC technology is technically ready for larger scale implementation, it could offer economical solutions for customers from a wide range of industries. In addition, construction of large-scale factories would generate up to 600 direct jobs, while economic activity could create two jobs in society for every new job in a manufacturing facility.

| Participants

ESSO NEDERLAND BV	Netherlands