

INNOVATION FUND

Deploying innovative net-zero technologies for climate neutrality

E-fuel Pilot: Innovative and cost-efficient production process for Power-to-Liquid using industrial off-gases

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

| Project Factsheet

The objective of the E-Fuel Pilot project is to set up and operate a first-in-kind plant for synthetic fuel production at Herøya, Norway. The key innovation is the Power-to-energy (P2X) e-fuel production process provided by Nordic Electrofuel AS (NELF), a breakthrough in flexibility, reliability, and simplicity. The P2X process will also be very energy efficient with carbon utilisation at close to 100%. The carbon source is CO₂ captured from a local ammonia plant. The carbon capture and use (CCU) based process will use reversed water gas shift and Fischer-Tropsch technology to produce 20 800 tonnes/year of synthetic hydrocarbons (syncrude). A relative greenhouse gas (GHG) emission avoidance above 99% is expected, compared with the reference scenario.

The plant will convert the CO₂ to e-fuel, at lower cost (CAPEX and OPEX) and higher efficiencies compared with current state-of-the-art projects. As well as sourcing carbon from ammonia plants, the project process is also suitable for other CO/CO₂ sources,

COORDINATOR

NORDIC ELECTROFUEL AS

LOCATION

Norway

CATEGORY

Energy intensive industries (EII)

SECTOR

Refineries

AMOUNT OF INNOVATION FUND GRANT

EUR 40,000,000

EXPECTED GHG EMISSIONS AVOIDANCE

595,333 tonnes CO₂ equivalent

STARTING DATE

01 January, 2024

FINANCIAL CLOSE DATE

31 May, 2027

ENTRY INTO OPERATION DATE

30 September, 2029

CALL NAME

InnovFund-2022-LSC

* 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.

such as metal and cement production or waste incineration. A patented reactor solution (named Safire) to achieve increased cost efficiency, will also be tested, which includes a new gas-gas syngas cooler that allows higher recovery of heat. The E-Fuel Pilot project will demonstrate the technical and economic feasibility of the concept, paving the way for a future full-scale plant.

The refined syncrude products will be used to replace fossil-based products in the aviation and other hard-to-abate sectors. The products can be used in existing engines and infrastructure without any modifications. Additionally, other benefits will be derived during use. For example, kerosene from syncrude has a clean combustion which significantly reduces particulate emissions, contributing to reducing cirrus clouds which are severe for global warming. The project

plans to avoid 595 333 tonnes of CO₂ equivalent of absolute emissions in the first 10 years of operation.

The E-Fuel Pilot will contribute to the overall objective of the REPowerEU goal of reducing fossil fuel consumption in industry and transport sectors. It will contribute to the decarbonisation of the aviation and maritime sectors, in line with the policy objectives of the REfuelEU Aviation and FuelEU Maritime initiatives, as well as other national goals.

The project will also have relevant socio-economic impact at regional level. The E-fuel Pilot project will contribute to creating 270 direct jobs and an estimate of 700 indirect jobs, including engineering activities. The next possible step is an “accelerator” plant with significantly increased production volume and further innovations.

| Participants

NORDIC ELECTROFUEL AS

Norway

Additional information on the [EU Funding and Tenders Portal](#).