European Commission

MANUFACTURING OF COMPONENTS FOR ENERGY STORAGE

INNOVATION FUND

Deploying innovative net-zero technologies for climate neutrality

HSS-Gen2: Voith Plug Hydrogen Storage System (Gen 2)

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

| Project Factsheet

HSS-Gen2 aims to develop and produce a 700-bar 'Plug Drive' hydrogen storage system for heavy-duty trucks. This novel, easy-to-integrate and cost-effective system will be commercialised for the first time. The project will be developed in two successive phases. First, the final technical developments will take place in a small-scale production site in Germany. Second, a large-scale commercial plant will be implemented in Eastern Europe. This innovation targets a key market, as over 75% of European freight is currently carried by road, and freight transport is expected to grow by 30% by 2030. Diesel-powered drivetrains contribute over 200 million tonnes of CO2 emissions annually. The project is expected to completely avoid relative greenhouse gas (GHG) emissions compared to the current diesel technology reference scenario, positioning it as a key solution for decarbonising the transport industry.

This project goes beyond current hydrogen storage solutions by offering a comprehensive system approach that includes tanks, a gas system, a control

COORDINATOR
Voith GmbH Co. KGaA

LOCATION
Germany

CATEGORY
Energy Storage (ES)

SECTOR
Manufacturing of components for energy storage

AMOUNT OF INNOVATION FUND GRANT
EUR 51,694,495

EXPECTED GHG EMISSIONS AVOIDANCE
15,038,772 tonnes CO2 equivalent

STARTING DATE
01 May, 2024

ENTRY INTO OPERATION DATE
30 June, 2028

FINANCIAL CLOSE DATE
30 June, 2026

** 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.*

unit, and mechanical components. This approach allows for an easy truck integration via only three interfaces. In addition, the proposed system will include an innovative sealing concept that allows tanks to be used across a wider range of temperatures than competing solutions. Furthermore, the project's winding process will increase the quality of the tanks due to the more precise and efficient placement of carbon fibres. This integrated design simplifies truck integration for manufacturers while introducing innovative technologies, state-of-the-art monitoring, and high-flow rapid refuelling to enhance performance. Over its first ten years of operation, the project aims to achieve significant GHG emissions savings of more than 15 million tonnes CO2e. The project also tests hydrogen tank carbon fibre recycling to support the principles of a circular economy. HSS-Gen2's system can potentially be applied in other sectors like marine and rail.

This project directly supports European and national climate change mitigation and sustainable transportation policy goals. Using emission-free drivetrains will contribute to reducing GHG emissions by 90% in the transport and logistics sectors by 2040. It also aligns with Europe's climate commitments, helping decarbonise a hard-to-abate industry and contributing to broader sustainability objectives. Additionally, it supports the implementation of the Clean Mobility Package in road transport, strengthening Europe's technological leadership and building a resilient supply chain for renewable drivetrains.

HSS-Gen2 has the potential to benefit local and regional economies significantly. It is expected to safeguard close to 100 jobs in Germany and create up to 170 direct jobs in the new location in Eastern Europe, strengthening local and European value chains. Development centres in Germany will foster young talent and support Europe's technological leadership. The creation of a new production site will provide sustainable and long-term jobs. Finally, the project will contribute to the continent's energy independence by establishing a resilient hydrogen tank storage supply chain and emphasising European partnerships.

| Participants

Voith GmbH & Co. KGaA	Germany
Voith HySTech GmbH	Germany