



INNOVATION FUND

Deployment of net-zero and innovative technologies

RockStore: accessible and cost-effective thermal energy storage

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

| Project Factsheet

Rockstore: Accessible and cost-effective thermal energy storage

This project demonstrates the commercialisation of 'Rockstore', a granite-based thermal energy storage solution with the ability to store thermal energy at around 300°C. This demonstration will show that bridging the supply and demand gaps in renewable energy production and consumption provides a substantial emission avoidance. It will also demonstrate a 100% relative Greenhouse Gas (GHG) avoidance compared to the reference scenario. The key innovation of Rockstore is the provision of heat storage in the ideal range between: Cold storage solutions (100°C) which are too cold for combined heat and power production, and superhot air storage solutions (>500°C), which are too hot for conventional Combined Heat and Power (CHP) equipment. This sweet spot between the two will make it commercially available to

COORDINATOR

HELIAC AS

LOCATION

Denmark

CATEGORY

Energy Storage (ES)

SECTOR

Other energy storage

AMOUNT OF INNOVATION FUND GRANT

EUR 4,269,604

EXPECTED GHG EMISSIONS AVOIDANCE

37,073 tonnes CO2 equivalent

STARTING DATE

01 January, 2024

ENTRY INTO OPERATION DATE

31 December, 2025

FINANCIAL CLOSE DATE

31 December, 2024

district heating plants connected to an electricity grid with a high intermittent renewable energy mix, which is applicable to many Danish and European cities.

Rockstore possesses the capability to deliver electricity rapidly and can offer power backup for several hours by using granite rocks in large steel tanks to store heat up to 330°C. Rockstore tanks are charged and discharged by using an eco-friendly oil that interfaces with the user's heat systems through a standard heat exchanger. The system allows for an increase in capacity, displaying the ability to store and release thermal and electrical energy at a lower cost compared to existing technologies, thus facilitating greater integration of renewable energy sources.

Rockstore's ability to charge with excess electricity and deliver heat and stored power independently from wind and solar production, particularly during periods of high energy demand, will aid European

Union member states in meeting their 2050 and 2030 targets outlined in the European Climate Law. Additionally, this technology contributes to the objectives of the European Green Deal by helping ensure affordable and consistent energy prices. By enabling a higher energy security in an electricity grid with a high mixture of renewables, the EU will be less reliant on imports of natural gas, which is a target stated in the REPowerEU initiative.

RockStore will produce heat to an existing 3rd party district heating grid, proving that renewable electrified heat production can be obtained at a low, stable price. The project also aims to displace total energy production of the system to 15.5 GWh thermal and storing heat exceeding 100°C, without putting stress on the electrical grid during peak periods in the demand curve, and paving the way for future projects.

| Participants

HELIAC AS

Denmark

ARTHA ENERGI P/S

Denmark

FORSYNING DANMARK APS

Denmark