



New EU research project CEEES aims at combining underground electricity storage with CO₂ sequestration

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The EU-funded CEEES project is developing a novel concept which will increase energy storage capacity from renewable energy sources (RES) while fostering the deployment of CO₂ storage technologies, supporting thus the implementation of the European Green Deal.

The EU's long-term climate strategy and the European Green Deal highlight the pivotal role of renewable energies for the continent's decarbonisation objectives. However, renewable energy sources (RES) such as wind and solar require the deployment of **large-scale energy storage systems** to increase the security of supply. Furthermore, the IEA World Energy Outlook 2020 and recent IPCC reports stressed that the Paris Climate Agreement and EU targets cannot be reached without a substantial **capture of CO₂ in hard-to-decarbonise sectors** such as cement, iron, steel or fertiliser production. Considering the current energy crisis, it is also imperative to diversify the portfolio of RES, making increased use of constant sources such as **geothermal energy**.

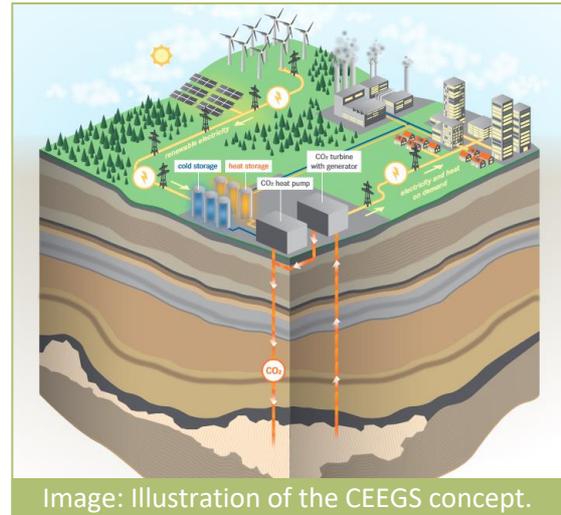


Image: Illustration of the CEEES concept.

The Horizon Europe-funded CEEES project is therefore developing an **innovative CO₂-based electrothermal energy and geological storage system**. The concept aims at making feasible the integration of transcritical CO₂ cycles with underground energy storage achieved through simultaneous CO₂ geological storage and geothermal heat extraction and **improving thus the efficiency and cost-effectiveness** of Carbon Capture, Utilisation and Storage (CCUS) and renewable energy storage technologies at a low environmental impact. CEEES intends to bring the theoretical concept to a **lab-scale proven technology**, offering a cross-sectoral technology solution for the energy transition.

CEEES held its kick-off meeting at the end of November 2022 and the project will run over a period of three years. Financed by the Horizon Europe programme with a budget of €2,992,060, CEEES is coordinated by the University of Seville. The consortium consists of 10 partners from 5 European countries, bringing together multidisciplinary skills in energy systems, energy storage, geology, geothermal systems, CO₂ geological storage and social sciences that will use the support of leading European geology associations and industries in the energy sectors.

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