Pilot STRATEGY

Accelerating CO_2 storage for a sustainable future

CO_2 geological storage in strategic territories Building a low-carbon, climate-resilient future: secure, clean and efficient energy

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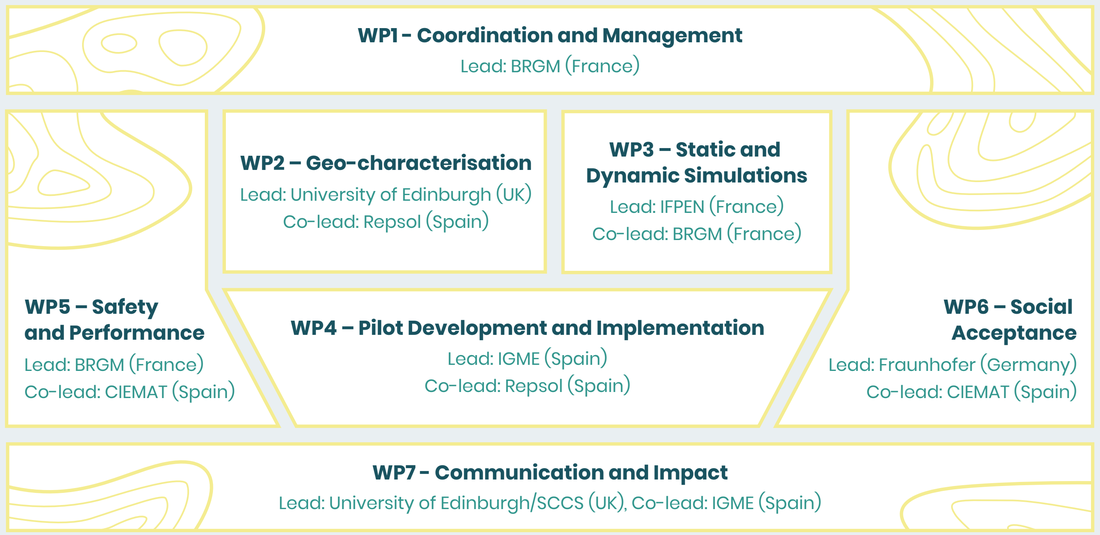
Abstract

PilotSTRATEGY focuses on advancing understanding of deep saline aquifers (DSAs) for geological CO_2 storage in five European industrial regions to support large-scale carbon capture and storage (CCS), a critical technology in the net-zero transition. Our research team of 16 scientific and industrial partners will build on the STRATEGY CCUS project which, among other things, identified a need to accelerate development of CO_2 storage.

DSAs have much promise for CO_2 storage, but are not well studied. PilotSTRATEGY will investigate DSAs in detail in three regions: Paris Basin (France), Lusitanian Basin (Portugal) and Ebro Basin (Spain). At the end of our five-year project, the level of site characterisation in these regions will be sufficient for a final investment decision to be made.

In two further regions, West Macedonia (Greece) and Upper Silesia (Poland), PilotSTRATEGY will update, and increase confidence in, understanding of DSA storage resources. This will enable these regions to start planning development of their CO_2 storage resources.

Recognising the societal challenges of implementing geological CO_2 storage, PilotSTRATEGY will develop public engagement strategies and include regional stakeholders and local communities in project implementation.



Our Regions

1. Paris Basin, France

- Industrial facility already capturing > 300 kt/CO_2 per year
- Storage resources within Keuper & Dogger Formations
- Keuper: identified effective storage capacity Tier 2 of 0.22Gt
- Dogger: identified theoretical storage capacity Tier 1 of 0.2Gt

2. Lusitanian Basin, Portugal

- Includes CO_2 emitters in the Setúbal – Figueira da Foz axis
- Onshore effective storage capacity Tier 2 of 0.2Gt; offshore theoretical storage capacity Tier 1 of 1.2Gt
- As elsewhere, societal acceptance will help determine storage pilot's location

3. Ebro Basin, Spain

- Region includes Tarragona and South Aragon industrial areas
- Potential CO_2 storage sites onshore and offshore. Social acceptance one of the criteria determining which proceeds
- DSA CO_2 storage capacity estimated at up to 0.85Gt Tier 2 and 0.2Gt Tier 1

4. West Macedonia, Greece

- Region covers Kozani and Ptolemaida industrial areas
- Storage resource provided by the Mesohellenic Trough
- CO_2 storage in DSA estimated at 1.16Gt Tier 1 in STRATEGY CCUS

5. Upper Silesia, Poland

- Region includes industrial areas of Katowice, Rybnik and Bedzin
- Poland's most industrialised region, with 16 coal mines and 7GW of power generation
- CO_2 storage capacity of 0.015Gt in uneconomic coal beds and of 0.1GT In DSA

6. Germany (supporting country)

7. UK (supporting country)

Key expected impacts

Impact	PilotSTRATEGY Actions/Outputs
Detailed geo-characterisation	- Conceptual Geological Model for five target regions - New data including 3D active & passive seismic - Characterisation (geological, geochemical & geomechanical) at field & sample scale for five regions
Safe storage sites: numerical simulations of CO_2 fate and its impact in subsurface	- Optimisation of well location and CO_2 injection rate by numerical simulations for four regions - Short & long-term CO_2 fate in subsurface for five regions - Pressure, geomechanical & geochemical impacts for four regions - Impacts in near wellbore linked to injectivity issues - Fault/fractures and caprock integrity for four regions
Development plans for safe storage sites in three most promising regions	- Pre-FEED level development plan for CO_2 storage sites in France, Portugal & Spain - Guidelines for risk identification in storage site development & assessment, including mitigation & preventive measures
Facilitate subsequent storage permit applications to help kick start CCS	- Complete documentation for injection permits for France, Portugal & Spain in local languages - Guidelines & road maps for permit submission, tailored to France, Portugal & Spain, in local languages - Overview for Greece & Poland
Baseline storage cost estimates	- Class 4 cost estimates for France, Portugal & Spain - Creation of cost estimate database for future CO_2 storage sites in other European countries
Increased public awareness	- Eight surveys in five target countries for public acceptance mapping - Public engagement plans (activities, targets, schedule, material) for the five regions - At least 10 workshops and engagement activities, aimed at citizens, media & policy makers, close to proposed pilot locations - Regional Stakeholders Committees in all five regions - Project dissemination: webinars, media and social media; clear, accessible information on project website
Laying groundwork for CCS operational stage in the mid-2020s	- Complete studies for pre-FID in three main regions, including pre-FEED design - Techno-economic pre-feasibility studies for CCS in all five regions - Engage key stakeholders on potential implementation of future storage facilities

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