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Development potential for onshore CO₂ geological storage in France

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In order to keep global temperature rise well below 2°C as set out in the Paris Agreement, efforts must accelerate to enable the further development and deployment of CO₂ Capture and Storage. CCS is one of the 7 challenges of Mission Innovation, one of the 10 key actions of the European Strategic Energy Technology Plan and, in France, is part of the National Strategy for Energy Research.

According to previous studies, France would need to store 1Gt of CO₂ over the 2020-2050 period. Studies of the Paris, Aquitaine and South-East basins have shown that they offer sufficient CO₂ storage potential.

In the Paris basin, several structures with storage capacities of 50-100 Mt CO₂ were assessed through dynamic calculations. In the Aquitaine basin, a CCS pilot operated by TOTAL injected 51 Kt of CO₂ into a depleted gas field. In the South-East basin, natural CO₂ occurrences have been studied and a feasibility study for CCUS in the industrial area of Fos-Marseille was performed.

Complementary to the ‘classic’ way of storing CO₂ in supercritical form, an innovative ‘CO₂-Dissolved’ concept of storing CO₂ in dissolved form while extracting geothermal heat is being developed. It is well suited for small industrial CO₂ emitters and local solutions.

France is thus investigating three complementary approaches: large storage offshore in the North Sea or Mediterranean Sea (ca. 10 Mt/a), medium storage onshore (ca. 1 Mt/a), and small decentralised storage combined with heat recovery (ca. 80-150 kt/a).

BRGM is deeply committed to advancing research for enabling CO₂ storage and is currently 1) preparing the ground for an industrial CO₂-Dissolved pilot, 2) coordinating the H2020 ENOS research project ‘Enabling Onshore CO₂ Storage in Europe’, 3) coordinating the French node of the ECCSEL European Research Infrastructure, and 4) carrying out upstream research on site characterization, monitoring, modelling and risk assessment.