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Storing CO₂ in deep saline aquifers as part of integrated territorial energy and climate plans

ABSTRACT n° 1921

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ABSTRACT [329 Words]

CO₂ Capture and Storage (CCS) is a key climate change mitigation technology, as highlighted by IPCC, UNFCCC and IEA. Geological storage of the CO₂ captured at industrial facilities such as power, cement and steel plants can massively reduce CO₂ atmospheric emissions and can even generate negative emissions when combined with CO₂ capture i) at biomass plants (BECCS - BioEnergy with CCS) or ii) directly from the atmosphere.

Deep saline aquifers (DSA) constitute suitable widespread targets with sufficient CO₂ storage capacity to enable worldwide CCS deployment. Globally there are several commercial CO₂ storage projects in DSA injecting each about 1Mtpa CO₂ (Norway, Canada, and soon Australia and USA). Pilots (e.g. Hontomin in Spain) and demonstration projects in other settings are currently running or planned to accelerate 'learning by doing' and push worldwide deployment.

The efficient and wise use of these DSA requires robust methodologies and tools for appropriate characterization and safe CO₂ storage, with no harm to the local environment including the overlying potable groundwater. Extensive research since the 1990s has enabled the development of best practices, such as the FP7 ULTimateCO₂ guidance report (2016). Legislation and regulations have evolved, such as the EU Directive on the geological storage of CO₂ (2009) and the upcoming ISO standards for CCS.

Interestingly, CO₂ storage in DSA could be combined with geothermal heat recovery, as investigated by France in the ANR CO₂-DISSOLVED project, or with enhanced water recovery for producing fresh water as investigated in China and USA.

The ambition of the Paris Climate Agreement to try to limit global warming to 1.5°C calls for even stronger consideration of CCS in countries' Intended Nationally Determined Contributions (INDCs) and in regions' integrated territorial energy and climate plans. The H2020 ENOS project "ENabling Onshore CO₂ Storage in Europe" (2016-2020), an initiative of the CO₂GeoNet European Network of Excellence, will contribute to facilitating this. Indeed, CO₂ storage offers more flexibility to territories for managing their CO₂ emissions while contributing to local economic development.