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Characterization of Sulcis coal basin (South-West Sardinia) for CO₂ geological storage: State of the project

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Ongoing Surveys



Hydrogeologic overview of the coal basin



Soil sampling to investigate the site



Re-processing of the available seismic profiles



Laboratory characterization (physic and acoustic properties) of rock samples

TACARBO



Structural geology and fault analysis



baseline on soils

from both caprock and Miliolitico formation





Natural seismicity through a monitoring network



Laboratory characterization (porosity analysis) of rock samples from both caprock and Miliolitico formation

Planned Activities



Sotacarbo have been planned the following activities for upcoming period:

- Acquisition, processing and interpretation of a new 2D seismic dataset;
- Definition of geological model;
- Detailed geochemical baseline near the faults;
- Fracture modelling in the Sulcis coal mine;
- A well at depths ranging from 1200 to 1500 m;
- Public awareness: dialogue with stakeholders on Sulcis perspective and CCS.

First Outcomes

- Baseline (CO2 in soil): defined;
- Faults: typically sealed;
- Laboratory analyses: low porosity of carbonatic formation;
- Low historical seismicity;
- Differences between the stratigraphy of N and S areas;
- Caprock and reservoir: high spatial heterogeneity in their petrophysical properties and then in their intrinsic characteristics;
- Knowledge sharing and public awareness promoted by a wide mining culture.







He (ppm)

Future Development: preliminary study for the construction of two laboratories

Field laboratory for leakage simulation (will be installed to perform multiple injection tests along the fault)

Multiple Injection tests through faults at depths ranging from 100 up to 300m by means of an inclined borehole and a network of piezometers (4-5).

- To study CO2 migration trough faults;
- To test geochemical (in house made and low cost CO2 sensors) and geophysical monitoring tools;
- To study water-gas-rock interactions;
- To study rocks behaviour and, eventually, micro seismic events, by monitoring seismicity and technical rocks characteristics.





Underground Laboratory (will be located in former gallery of the coal mine)

This part of the project provides the construction of a structure / underground laboratory that can study the characteristics of the levels of coal in the soil and cap rocks for evaluating the characteristics of seal of the system. The permanent laboratory also has the aim to allow the development of new systems of measurement and monitoring of the physical characteristics of the rocks.

In the gallery will be able to direct observation of the rocks, and may be permanently installed machinery for the following experiments or measurement procedures:

- Measurements of speed of CO2 migration both in coal beds and in the cap rock outcropping in the gallery (mine);
- The study of chemical reactions (water rock CO2) for the construction of geochemical models "site specific".

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