

Internship in Carbon Sequestration (CCUS)

Summary

- **Length:** 6 months
- **Location:** 232 Avenue Napoléon Bonaparte, Rueil-Malmaison, 92500, France
- **Reference:** RP-2022-01
- **Starting Date:** March-December 2022
- **Internship paid and compliant with school conventions**

Title

CCUS feasibility screening and numerical simulation of carbon underground storage.

Intern profile

Final year student enrolled in a master's degree program with a geoscience option. A taste for numerical simulation is preferred along with a good understanding and intuition to represent physical phenomena associated to fluid flow in porous media and CO₂ physical and chemical interactions with underground fluid and rock systems.

Objectives

As a leading consulting firm in geoscience-related problems, supported by research and development performed at IFPEN Group, Beicip-Franlab is investing more and more resources in creating workflows and solutions to tackle the Energy Transition challenge.

As such, Beicip-Franlab offers an internship dedicated to the technical evaluation of CO₂ underground storage with two different objectives:

- Development of a screening tool to evaluate the feasibility of CCUS for any underground candidate site, including but not limited to:
 - Definition of a 'suitability' index based on average technical characteristics of the site
 - Quick computation of wells injectivity and its evolution through time, as well as computation of storage capacity, based on characteristics of the candidate site
- Evaluation of several internal and external numerical tools to simulate the long-term evolution of CO₂ storage, based on an existing study recently performed by Beicip-Franlab
 - Advanced simulation of physical and chemical interactions of CO₂ with the reservoir rock and fluids (consideration of CO₂ mineralization phenomena as an example)
 - Very long-term simulations (>1000 years) to evaluate the stability of the storage system
 - Impact of reservoir temperature and its evolution on CO₂ storage performance

Main tasks undertaken during the internship

- Literature review with regards to CCUS feasibility assessment and CO₂ storage numerical simulation
- Development of a screening tool (Excel) and the associated documentation
- Numerical simulation of a CO₂ storage system with various scenarios/options to investigate
- Comparison of numerical simulation options (including dedicated literature review / benchmarking) highlighting their benefits and limitations
- Preparation of a scientific paper for publication
- Participation to consulting studies related to CO₂ storage, if any and if deemed relevant

The internship will be supervised by a Senior Reservoir Engineer and the Business Unit Manager related to Energy Transition activities.

Software used

PumaFlow (IFPEN simulator) with possibility to test other simulators

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Reference: **RP-2022-01**