BeicipFranlab
An IFP group company

Internship in Carbon Sequestration (CCUS) and Carbon Footprint Reduction of Oil and Gas Operations

Summary

- **Length:** 6 months
- **Location:** 232 Avenue Napoléon Bonaparte, Rueil-Malmaison, 92500, France
- **Starting Date:** First semester 2024
- **Internship paid and compliant with school conventions**

Title

CCUS feasibility screening and evaluation of tools to calculate CO2 emissions related to oil and gas production activities.

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 CO_2 physical and chemical interactions with underground fluid and rock systems. The candidate should also be a fast learner to understand the whole context of an oilfield to identify CO_2 sources of emissions.

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 CO_2 underground storage with two different objectives:

- Development of a screening tool to evaluate the feasibility of CCUS for any underground candidate site based on most sensitive parameters already identified, 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 and comparison of tools and workflows dedicated to the computation of greenhouse gas emissions (CO_2 in particular) from oil and gas production activities:
  - Familiarization with in-house workflow and with open-source code eCalc™
  - Search for alternative workflows / tools
  - Definition of a robust workflow leveraging the advantages of existing tools and application to a real case study of an oil reservoir development plan
  - Definition and numerical simulation of alternative scenarios of development to identify scenarios mitigating the CO2 emissions while ensuring the oil production target.

Main tasks undertaken during the internship

- Development of a screening tool (Excel) and the associated documentation
- Benchmarking of tools and workflows dedicated to the estimation of CO_2 emissions associated to oil and gas production activities (including dedicated literature review) highlighting their benefits and limitations
- Definition of a robust and pragmatic workflow leveraging the benefits of existing tools and methodologies to compute CO2 emissions associated to oil (or gas) fields development plans
- Numerical simulation of a field development plan to identify alternative scenarios mitigating the CO_2 emissions
- 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. A Senior Researcher from IFPEN will also be involved in the supervision.

Software used

- PumaFlow (IFPEN simulator) with possibility to test other simulators

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