

Project title – Idéfix: A Purification and storage unit

Context:

The technology developed at the EPFL Carbon team is based on a hybrid technology setup, with a first stage of adsorbents, and a second stage composed of a graphene membrane setup. The adsorbents are used in a low energy Temperature Swing Adsorption process which allows us to concentrate CO₂ from 0.04% in the atmosphere to 1%. This enriched feed is then passed onto the membrane stage for further purification up to 95%.

During the past semester, a team has developed an initial version of the membrane setup called Idéfix. It is a portable unit with space for one membrane stage. However, it is still a low performance unit, with lots of space for improvements.

Description:

You will be tasked with the redesign and improvement of the purification unit, as to ensure reliable performance, sensor readings, membrane heat regeneration as well as storage. You will be working in a highly interdisciplinary and stimulating environment (mechanical and electronical workshops, DLL coaches, other student projects, chemical engineers from the LAS and LFIM in Sion etc.)

Depending on your speed of progress, you will be able to implement alternative designs for the setup.

Requirements:

- Some knowledge in mechanical engineering, thermodynamics & fluid mechanics
- Electronic circuit design & Arduino
- Fast mechanical prototyping
- Bonus: LabView and fluid systems design experience would be a strong plus, independence and good communication would be also greatly appreciated

Contact:

If you are interested or have any more questions, send us an email at contact@epflcarbonteam.ch -> We'll get back to you as soon as possible!

Remarks:

During the semester, we will organize 2 to 3 days of field trips to the Sion laboratories to test the system on the membranes before we can have them permanently in Lausanne. The rest of the work will be done on the EPFL campus