

Post-doctoral position at the University of Liège – Belgium
in the field of process design for CO₂ capture solutions

The Department of Chemical Engineering at the University of Liège is offering a post-doctoral position in the field of process design for CO₂ capture technologies. This position implies process modeling and process systems engineering tasks, as well as support to experimental activities including pilot design, construction and operation.

Research area:

Reducing CO₂ emissions is a key challenge of the global energy transition. To do so, the actions by order of priority should be: (1) increase energy efficiency; (2) deploy low-carbon energies and (3) capture CO₂ emissions. Although not being a silver bullet solution, Carbon Capture technologies have the potential to rapidly and significantly contribute to the reduction of CO₂ emissions from various sources such as heavy-emitting industries or thermal power plants.

The University of Liège has more than decade-long experience in CO₂ capture and re-use. In particular, it has developed a strong database of various CO₂ capture simulation models, including post-combustion CO₂ capture with various solvents, pre-combustion and oxyfuel capture processes. Besides process design, our work also focuses on identifying optimum technologies for given local configurations, including techno-economical, environmental and social aspects as well as related infrastructure needs. From an experimental standpoint, previous activities at the University of Liège include degradation studies of CO₂ capture solvents and the establishment of kinetic models to allow for proper consideration in process models. Our approach is to offer technological support for making CO₂ capture technologies happen at local and international levels.

Description of the tasks:

The selected post-doctoral researcher will be active in projects related to CO₂ capture at the Department of Chemical Engineering. Upon discussions based on the candidate's profile, the tasks can target some of the following objectives:

- Process design for various CO₂ capture technologies, including post-combustion capture with amine solvents and other middle- to high-TRL technologies.
- Experimental design, construction and operation of a pilot unit for CO₂ capture located on the University of Liège campus (flue gas from a biomass/gas CHP plant)
- Process optimization (steady-state and dynamic modeling) and impact on the infrastructure needed to successfully achieve energy transition in a Belgian context

Moreover, the position includes following aspects:

- Participation to project meetings, presentation of results at conferences, writing of scientific articles, interaction with industrial and academic partners
- Research management and support to the activities of a group of about 10 international PhD students active in CO₂ capture and re-use
- Teaching duties are not part of the position, but post-doctoral fellows are encouraged to take part to teaching activities based on their own experience, upon discussion with lecturers.

Candidate's profile:

Candidates must hold a PhD degree in Chemical Engineering or similar field (process, energy, electro-mechanical, environmental engineering...). Experience in process design, simulation and optimization, either with flowsheeting tools such as AspenOne software (or similar) and/or numerical programming (Python, Matlab...) is required. Demonstrated experience in laboratory work, including design and construction of lab set-up, measurement and analytics, planning of experiments, definition of safety guidelines is a clear asset.

Candidates should also evidence interest in project and research management. They must be able to work in autonomy and identify their own tasks in relation to the group's objectives. Ease of interaction with academic and industrial partners is welcome. Excellent communication in English (oral and written) is required. Knowledge of French is very much welcome but not mandatory.

Research environment:

The successful candidate will join a dynamic and growing team within the PEPs group of the Department of Chemical Engineering (DCE), under the supervision of Prof. Grégoire LEONARD. The DCE employs about 75 people mostly active in the fields of process engineering and materials sciences in an international-friendly environment. The DCE is also an active member of the FRITCO₂T platform (Federation of researchers in innovative technologies for CO₂ transformation) at ULiège, and a founding member of the CO₂ Value Europe Association. More information about the Department of Chemical Engineering: www.chemeng.uliege.be.

Recruitment process:

Applications containing your CV, a cover letter highlighting your skills with respect to the position, and at least one reference letter should be submitted by e-mail to secretary.chemeng@uliege.be with mention "Post-doc application CO₂ capture". Application deadline is August 31, 2022. Candidates selected from this first round will be invited for an on-line interview. The successful candidate will receive a position for two years, with extension possible. The grant amount is in accordance with Belgian university standards.