

PhD & Post-Doc Positions: Offshore Carbon Capture Utilization & Sequestration (CCUS)

Pathways to a survivable future climate suggest that carbon capture and sequestration (CCS) from the atmosphere will become necessary by mid-century. In advance of that time, research and demonstration projects are required to prove out viable technical solutions to reliably capturing and storing carbon, on a scale that can be deployed globally. The roll-out to CCS will likely include carbon capture and utilization (CCUS), making use of captured carbon for synthetic fuels. At the same time, there is tremendous 'stranded' far-offshore wind energy too remote from grid-connection for use, but potentially harvestable to power CCUS systems, either fixed position or on-board 'energy ships' using wind propulsion and ship-mounted water turbines for on-board electricity generation.

1 PhD and 2 Post-Doc positions are available in a research project led by Dr. Curran Crawford (who directs the Sustainable Systems Design Lab - ssdl.uvic.ca, and part of IESVic) that has recently received donor funding to complement ongoing work that is part of a larger Solid Carbon project funded by the Pacific Institute for Climate Solutions. The Solid Carbon project is looking at a 'baseline' floating wind turbine + direct air capture (DAC) to optimize a CCS system to sequester carbon in basalt rock under the ocean ~3000m of water. The additional HQP to be funded in this add-on project require a **PhD student** and **Post-doc** specifically in area of DAC and CCUS process/chemical engineering. The intent is not necessarily to synthesize new processes, but rather to model proposed technologies so as to enable cross-comparison and understand/optimization implications in operating offshore. An additional **Post-doc** will contribute to overall systems engineering activities, in particular looking at energy-ship based concepts in the same system optimization framework being developed in Solid Carbon to cross-compare various wind turbine/pipeline/vessel system configurations.

Requirements

- MSc/MS degree for PhD position, PhD degree for Post-docs in a relevant area of engineering
- The PhD and first Post-doc require specific experience in chemical/process engineering, preferably of DAC and/or CCUS applications
- The second Post-doc should have experience in an aspect of wind energy/energy systems/wind-based vessel propulsion, with experience in multidisciplinary/multi-fidelity optimization techniques
- Familiarity with and enthusiasm for low/negative-carbon energy systems analysis
- Knowledge of Python and LaTeX tools for model development and figure generation
- Strong writing, conversational and presentation abilities in English
- Ability to work effectively in a diverse team

Timeline

Ideally starting January 2021, but applications accepted on a rolling basis.

How to apply

Interested candidates should email Dr. Crawford at curranc@uvic.ca with subject CCUS Positions; attach:

- A detailed curriculum vitae
- A one-page cover letter describing your relevant (research) experience and motivation for the position
- Names and contact details for two references

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