

DGT2 - Optimal configuration of an offshore network of power generation stations with CCS.
Universidade Federal de Sao Paulo

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Job Title DGT2 - Optimal configuration of an offshore network of power generation stations with CCS.

Department Naval and Oceanic Engeneering

Institution Universidade Federal de Sao Paulo
Sao Paulo, , Brazil

Date Posted Oct. 22, 2025

Application Nov. 7, 2025

Deadline

Position Start Available immediately
Date

Job Post-Doc

Categories

Academic Naval Architecture & Marine Engineering
Field(s)

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Description

Mathematical modeling and optimization of offshore power hub networks for sustainable FPSO operations using clean energy and carbon capture systems (CCS). Graduated in engineering or computer science, with experience in mathematical modeling and optimization methods.

The project focuses on developing sustainable oil and gas production through FPSOs that utilize clean sources of electrical energy — initially in a complementary way, but potentially entirely in the future.

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The energy supplied to these FPSOs will come from floating units called power hubs, which will employ clean and advanced technologies for generating electricity from the combustion of natural gas, coupled with carbon capture (CCS) systems that store CO₂ in subsea geological formations. The project will be developed at a strategic decision-making level. This means defining where to position the power hub, which connections to establish (i.e., with which FPSOs) for receiving natural gas risers, identifying the type of hull, defining the level of power generation associated with different technologies, and determining the connections to the FPSOs that will be supplied. Finally, the captured CO₂ will be transported to subsea geological formations for storage. The design of the power hub poses the challenge of selecting which technologies will be used in the power generation plant, determining the installed capacity, and arranging the equipment within the hull, along with evaluating different hull types (FPSO and semi-submersible). Based on the estimated oil and gas production curve of the FPSOs that will come into operation, it is possible to derive an energy demand curve, where part of this demand will be supplied by the power hub. The system optimization aims to minimize CAPEX and OPEX, taking uncertainties into account.

Contact Information

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