Post-doc for CO2 Catch-Up Project

Engels -- Faculty/department Mechanical, Maritime and Materials Engineering
Level PhD degree
Maximum employment Maximum of 38 hours per week (1 FTE)
Duration of contract 1 year
Salary scale €2379 to €3755 per month gross

Mechanical, Maritime and Materials Engineering

The 3ME Faculty trains committed engineering students and PhD candidates in groundbreaking scientific research in the fields of mechanical, maritime and materials engineering. 3ME is the epitome of a dynamic, innovative faculty, with a European scope that contributes demonstrable economic and social benefits.

The Process and Energy Department aspires to conduct world-class research and education focusing on process and energy technologies for sustainable development. The research is conducted from a deep understanding of the underlying physics and is oriented towards industrial applications and societal needs.

This project is being conducted in collaboration with RWTH Aachen University (Germany). At TU Delft, the work will be collaborated on by the group for Intensified Reaction and Separation Systems Separation and Energy Technology under the guidance of Assoc. Prof. Piero Colonna.
At RWTH Aachen Universty, the Chair of Technical Thermodynamics at RWTH Aachen University, headed by Prof. André Bardow, is leading the activity.

Jobdescription

CO2 capture and storage (CCS) is one of the leading options for the short-term reduction of greenhouse gas emissions. Currently, the CO2 capture step accounts for 75% of the cost of the CCS chain and leads to significant increase in energy usage. Efficient operation of the CO2 capture unit is crucial.
Absorption is the leading option for CO2 capture today. In the chemical industries, steady-state operation is the standard operation mode, whereas major load changes are common in energy systems.
The Dutch government is funding the energy provider Nuon to build a CO2 capture pilot plant at the site of the Buggenum IGCC power station and to perform R&D activities. Research partners are the Process and Energy and the Chemical Engineering Departments of Delft University of Technology, together with TNO and KEMA. R&D activities are aimed at the construction of a new, large and futuristic IGCC power plant in the north of the Netherlands (the Magnum power plant), including CO2 capture.
In this project, the dynamic behaviour of the Nuon CO2 capture plant will be analysed. A detailed, dynamic model of the CO2 absorption and desorption units will be developed and validated using plant data. The behaviour during dynamic operation, load changes and start-up will be analysed. Reduced models will be derived, and improved strategies for control and operation will be developed.

Requirements

This position requires an excellent PhD in an area of process engineering (physical, mechanical, chemical), or technical chemistry, as well as experience in dynamic process simulation using commercial simulators (preferrably using gPROMS). Knowledge and experience in the fields of process systems engineering and process simulation using Aspen would be advantageous. Applicants should be fluent in English.

Conditions of employment

TU Delft offers an attractive benefits package, including a flexible work week, free high-speed Internet access from home, and the option of assembling a customised compensation and benefits package (the 'IKA'). Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities.

Information and application

For more information about this position, please contact P. Colonna, phone: +31 (0)15-2782172, e-mail: P.Colonna@tudelft.nl. To apply, please e-mail a detailed CV, a publication list, the abstract of your PhD thesis and a list of references along with a letter of application by 30 October 2010 to: application-3mE@tudelft.nl.
When applying for this position, make sure to mention vacancy number 3ME10-26.