Helmholtz-Zentrum Dresden-Rossendorf e.V.

With cutting-edge research in the fields of ENERGY, HEALTH and MATTER, around 1,500 employees from more than 70 nations at Helmholtz-Zentrum Dresden-Rossendorf (HZDR) are committed to mastering the great challenges facing society today. The Institute of Fluid Dynamics is conducting basic and applied research in the fields of thermo-fluid dynamics and magnetohydrodynamics in order to improve the sustainability, the energy efficiency and the safety of industrial processes. The Department of Thermal Energy and Process Technology is looking for a

PhD Student (f/m/d) Dynamic Process Modelling and Value Chain Assessments for Sustainable Methanol from Renewable Energy.

City: Dresden; Starting date (earliest): 01/05/26; Duration: 3 years; Remuneration: TVöD Bund; Reference number: 2025/169; Closing date: 27/02/26

Working field

- Analysis and evaluation of various technologies for green methanol production with regard to efficiency, costs, and environmental impact
- Development of dynamic process models for electrified methanol processes under fluctuating power supply from renewable sources
- Simulation and optimization of the operating behavior of flexible systems, including control and operating strategies
- Creation of a technology and process database for selecting suitable production pathways and scenarios
- Techno-economic analyses of regional methanol production and supply chains in Europe and neighboring regions
- Contribution to the design and experimental validation of innovative reactor concepts (e.g., membrane reactors) for future demonstrations
- Scientific documentation and communication of results in the form of conference contributions and journal publications

Requirements

- Completed university studies (Master/Diploma) in the field of chemical engineering, process engineering, mechanical engineering, or a comparable and closely related field of study
- Knowledge of thermodynamics, heat and mass transfer phenomena, process engineering, and process technology
- Knowledge in process control theory (e.g., model predictive control, fuzzy control, etc.)
- Excellent teamwork and communication skills in an interdisciplinary and international research environment
- Motivation and self-discipline to carry out research independently
- Willingness to work on numerical and experimental tasks

- Programming skills (e.g., Matlab, SIMULINK, Python) or other common process simulators
- Excellent command of English (spoken and written)

What we offer

- A vibrant research community in an open, diverse and international work environment
- Scientific excellence and extensive professional networking opportunities
- A structured PhD program with a comprehensive range of continuing education and networking opportunities - more information about the PhD program at the HZDR can be found here
- Salary and social benefits in accordance with the collective agreement for the public sector (TVöD-Bund) including 30 days of paid holiday leave, company pension scheme (VBL)
- We support a good work-life balance with the possibility of part-time employment, mobile working and flexible working hours
- Numerous company health management offerings
- Employee discounts with well-known providers via the platform Corporate Benefits
- An employer subsidy for the "Deutschland-Ticket Jobticket"

Application

We look forward to receiving your application documents (including cover letter, CV, diplomas/transcripts, etc.), which you can submit via our online-application-system: https://www.hzdr.de/db/Cms?pNid=490&pLang=en&pOid=76298

More information at https://stellenticket.de/200521/TUBS/
Offer visible until 08/02/26