Conducting research for a changing society: This is what drives us at Forschungszentrum Jülich. As a member of the Helmholtz Association, we aim to tackle the grand societal challenges of our time and conduct research into the possibilities of a digitized society, a climate-friendly energy system, and a resource-efficient economy. Work together with around 7,500 employees in one of Europe's biggest research centres and help us to shape change!

At the Institute of Climate and Energy Systems - Energy Systems Engineering (ICE-1) we focus on the optimal design and operation of integrated, decentralized energy systems with a high share of renewable energy. Computer simulation and numerical optimization are our essential tools to arrive at efficient, reliable, and cost-effective solutions. We contribute both to the development of mathematical models and to the development of improved simulation methods and optimization algorithms. Our methods and software-tools are validated against operating data of real systems. Furthermore, we conduct comprehensive case studies in order to test and further improve the scalability and the performance of our models and algorithms. Specially adapted methods and codes enable us to exploit the potential of high-performance computing with the aim of solving particularly large and complex problems.

We offer you to the next possible date an exiting

Master Thesis - Optimal Design of Integrated Pulp and Paper Production with Renewable Energy

Your Job:
Pulp and paper production is an energy-intensive process, due to the demand of thermal energy for the paper drying stage and electricity for pulp production. While biomass use substantially reduces GHG emissions, reliance on a carbon intensive electricity grid remains a key environmental challenge.

In this thesis, optimization tools will be used to determine the optimal design and operation of an integrated pulp and paper plant. The model will combine various technological components and demand response. The aim is to minimize costs and global warming impact, thereby improving both economic and environmental performance.

Your tasks in detail:

The job will be advertised until the position has been successfully filled. You should therefore submit your application as soon as possible. We look forward to receiving your application via our **Online-Recruitment-System!**

Questions about the vacancy?
Get in touch with us by using **our contact form.**
Please note that for technical reasons we cannot accept applications via email.
www.fz-juelich.de

- Reviewing relevant literature on energy systems in pulp and paper production
- Expanding the existing optimisation model based on our in-house framework COMANDO
- Implementing demand response strategies based on variable electricity prices
- Documenting and presenting the results in a structured and clear manner

Your Profile:
We are looking for a motivated and committed student who is eager to contribute to innovative projects in the field of energy systems and process design.

You are a great fit for our team if you:
- are successfully completing your studies with above-average grades in Chemical Engineering, Energy- or Process Systems Engineering, Mechanical Engineering, Computational Engineering Sciences, Simulation Sciences, or similar
- have gained practical experience in optimization methods
- bring solid programming experience (preferably Python)
- are able to work independently and in a structured manner
- communicate confidently in English, both written and spoken
- have a strong interest in energy systems and process design
- have German language skills, but this is not mandatory

Our Offer:
We work on highly relevant innovative topics and offer you the possibility to actively shape the change. We support you with:
- Supervision by an expert in the respective fields
- An interesting and socially relevant topic for your thesis with future-oriented themes
- Deep insight into current research on optimization of industrial energy systems
- Ideal conditions for gaining practical experience alongside your studies
- Flexible working arrangements e.g. partly working from home
- An interdisciplinary collaboration on projects in an international, committed and collegial team
- Excellent technical equipment and the newest technology
- Highly motivated scientists of different subject areas working together
- The chance to independently prepare and work on your tasks
- A large research campus with green spaces, offering the best possible means for networking with colleagues and pursuing sports alongside work

In addition to exciting tasks and a collaborative working atmosphere in Jülich, we have a lot more to offer: https://go.fzj.de/benefits

We welcome applications from people with diverse backgrounds, e.g. in terms of age, gender, disability, sexual orientation / identity, and social, ethnic and religious origin. A diverse and inclusive working environment with equal opportunities in which everyone can realize their potential is important to us.

Further information on diversity and equal opportunities: https://go.fzj.de/equality