



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 - Jülich Systems Analysis, we investigate how a sustainable energy system could look like. To achieve greenhouse gas neutrality, a comprehensive reduction in emissions is necessary in all sectors of the energy system. However, it is to be expected that residual emissions will remain that cannot be completely avoided. In industry and energy supply, CO2 could be captured and subsequently the captured CO2 could either be permanently stored or used as a feedstock for chemical products. Nevertheless, residual emissions are likely to remain, which will have to be offset by negative emissions. The usage of negative emission options, CO2 capture, and CO2 utilization is currently still unclear. Become part of our international research team and contribute your ideas and creativity to developing solutions for these issues. Here you can get a first impression of working at ICE-2: https://www.youtube.com/watch?v=Vw-u9-LlbPM.

We are offering a

PhD position – Modelling of CO2 capture, CO2 utilization and negative emission options in an energy system model

Your Job:

Analysis of possible applications of CO2 capture and CO2 utilization in the energy system requires detailed techno-economic modelling of these technologies. A major focus of this doctoral thesis is the implementation of these technologies in an integrated energy system model that represents all sectors of the energy system with a high degree of technological detail. This optimization model is based on the institute's own FINE framework https://github.com/FZJ-IEK3-VSA/FINE CO2 transport and storage should be modelled in a simplified way in the energy system model based on findings from a related doctoral thesis. In addition, natural (e.g. afforestation or rewetting of peatlands) and technical options (e.g. biomass carbon capture or direct air capture) for providing

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



negative emissions should be modelled in detail.

Your tasks in detail:

 \cdot Extension of the existing energy system model to include technologies for CO2 capture and CO2 utilization, especially in the industrial sector

· Modelling of natural and technical options for provision of negative emissions

 \cdot Simplified representation of CO2 transport and CO2 storage in the energy system model

 \cdot Development of scenarios for the use of CO2 capture, CO2 utilization and negative emissions options in a greenhouse gas-neutral energy system

Your Profile:

 Master's degree in the field of natural sciences, engineering, industrial engineering or a related field of study

- Interest in energy technology and energy economics
- · Experience in energy system modelling is an advantage
- Basic programming skills, ideally in Python
- Independent and analytical way of working
- Reliable and conscientious working style
- · Fluent written and spoken English; German language skills are advantageous

Please also apply if you do not yet have all the required skills and knowledge. We may be able to teach you missing skills during your induction.

Our Offer:

We work on the very latest issues that impact our society and are offering you the chance to actively help in shaping the change! We offer ideal conditions for you to complete your doctoral degree:

 \cdot A highly motivated working group as well as an international and interdisciplinary working environment in one of the largest research institutions in Europe

- · Excellent scientific and technical infrastructure
- · Continuous professional support from your scientific supervisor

• The opportunity to complete a doctoral thesis within 3 years through professional supervision and internal support services –time taken to submit the final thesis for the last 16 doctoral students at ICE-2: 2.7-3.4 years

· Best conditions for successful work in a home office

 · 30 days of annual leave and provision for days off between public holidays and weekends (e.g. between Christmas and New Year)

• Further development of your personal strengths, e.g. through an extensive range of training courses; a structured program of continuing education and networking opportunities specifically for doctoral researchers via JuDocS, the Jülich Center for Doctoral Researchers and Supervisors: https://www.fz-juelich.de/en/judocs

• Targeted services for international employees, e.g. through our International Advisory Service

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

The position is initially for a fixed term of 3 years. Pay in line with 75% of pay group 13 of the Collective Agreement for the Public Service (TVöD-Bund) and additionally 60 % of a monthly salary as special payment ("Christmas bonus"). Pay higher than the basic pay may be possible. The monthly salaries in euros can be found on page 66 of the PDF download: https://go.fzj.de/bmi.tvoed Further information on doctoral degrees at Forschungszentrum Jülich including our other locations is available at:



https://www.fz-juelich.de/gp/Careers_Docs

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