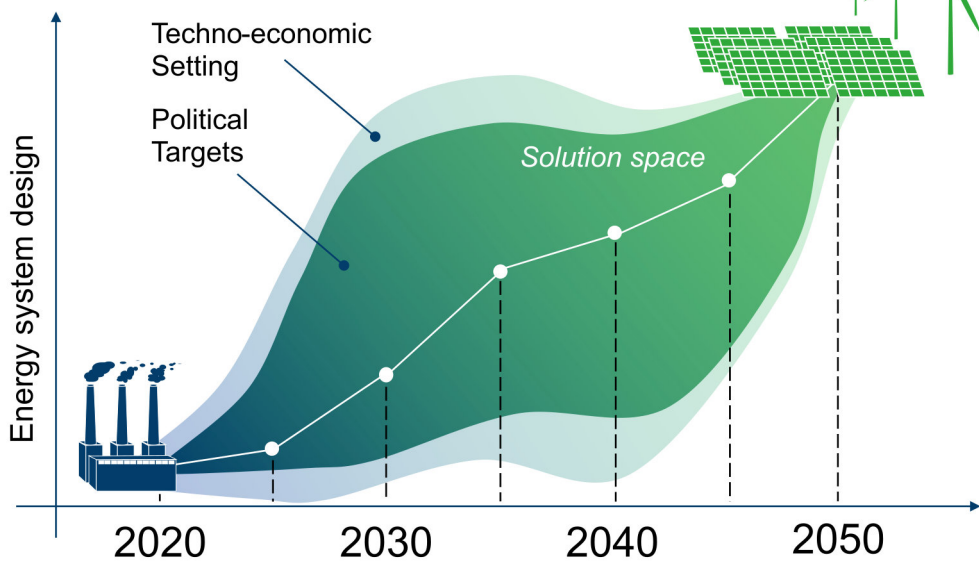


Energy System Transformation



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 7,400 employees in one of Europe's biggest research centres and help us to shape change!

At the Institute of Energy and Climate Research - Jülich Systems Analysis (IEK-3), we investigate how a sustainable energy system can be achieved and what it might look like. To reach greenhouse gas neutrality, negative emission pathways have to be shaped to compensate for hard to abate emissions in addition to a strict defossilization. Sequestration of CO₂ directly from the air combined with underground storage (Direct Air Capture and Storage DACS) can be an important puzzle piece within these pathways. In the realm of an exciting research project with top-class partner institutions (DACStorE - <https://www.dacstore-project.com/de>), we assess and advance this technology for a broad roll-out with the goal of providing negative emissions. Become part of our interdisciplinary project team and contribute your ideas and creativity to pave this way. Here you can get a first glimpse of our working life at IEK-3: <https://go.fzj.de/iek-3>

We are offering a

PhD Position – Negative emissions through cost-optimal Direct Air Capture and Storage plant design

Your Job:

One essential step towards the ramp-up is the identification of site-specific optimal design of DACS plants, which will be the focus of the advertised PhD. To identify optimal DACS plant designs in terms of their techno-economic characteristics an optimization model is to be developed in the institutes' inhouse modelling framework FINE (<https://github.com/FZJ-IEK3-VSA/FINE>) in addition to technical models allowing to assess technical scaling and an optimal operation. The optimal plant design is identified by considering the energy supply system, the choice of capture technology, the DAC-plant's technical design, the DAC-plant's operational concept and the positioning of the DAC-plant with regards to the storage site and needed transportation effort. Your tasks in detail:

- Development of a modelling structure for representing the DACS-system in the

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

FINE-Framework

- Detailed model of DAC technologies including their technical design and scaling effects
- Parameterization and design of the energy supply system for providing electricity (and heat/cooling) for the DAC plant
- Detailed model for DAC operation with respect to fluctuating energy supply and climatic conditions
- Model for assessing the positioning of the DAC-plant with regards to the storage site and needed transportation
- Development of appropriate scenarios to test the DACS-plant design and to obtain robust recommendations regarding the overall design

Your Profile:

- Master's degree in the field of natural sciences, engineering, or a related field of study
- Knowledge of energy process engineering is an advantage
- Huge interest in energy technology and economics
- Experience in energy system modeling is beneficial
- First 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 feel free to apply for the position even if you do not 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:

- A highly motivated working group as well as an international and interdisciplinary working environment in one of the largest research institutions in Europe
- Participation in an exciting consortium project with top-class partner institutions
- Excellent training, interdisciplinary collaboration, and practical insights in questions regarding negative emission technologies within the `Helmholtz Research School for Negative Emission Technologies`
- 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 IEK-3: 2.7 - 3.4 years
- Excellent scientific and technical infrastructure
- Opportunity to participate in (international) conferences and project meetings
- Continuous professional support by your scientific supervisor(s)
- Best conditions for successful work in 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 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“). 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.