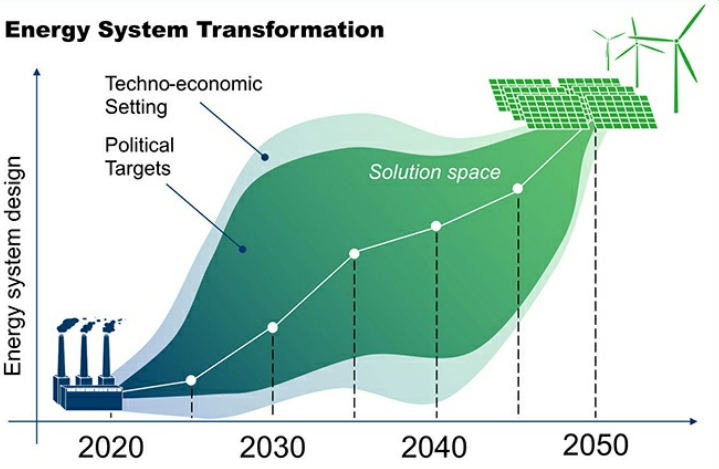


Energy System Transformation



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 7,100 employees in one of Europe's biggest research centres and help us to shape change!

Achieving a secure, greenhouse gas-neutral energy supply is one of the greatest challenges of the 21st century. At the Institute for Energy and Climate Research – Techno-Economic Systems Analysis (IEK-3) –, we are researching how possible cost-effective transformation strategies must be designed to achieve this. Become part of our research team and contribute your ideas and creativity to help shape what a future greenhouse gas-neutral energy system could look like.

We are offering a

PhD Position – Expansion Planning of Power Grid under Flexible Distributed Energy Resources

Your Job:

Understanding and assessing electrical power networks is necessitated by the transition to sustainable energy resources in an effort to alleviate climate and humanity-related challenges. In addition, the adaptability of decentralized energy resources has the potential to lower network reinforcement costs. However, coordination between the transmission and distribution systems is essential and challenging in order to exploit the flexibility of distributed energy resources. Therefore, in your doctoral thesis, you will investigate the opportunities and challenges associated with the integration of distributed energy resources in electrical power systems. In doing so, you will investigate various issues, such as: How can transmission and distribution systems be coupled for planning and grid expansions? How can the flexibility provided by distributed energy resources at the distribution level be effectively coordinated with the transmission system? To address these questions, you will further create a power exchange model and perform the following tasks:

- Constructing precise geo-referenced synthetic electrical datasets for transmission and distribution systems
- Combining and further developing the distribution network model and the transmission network model of the IEK-3 model suite to depict the entire electrical power network
- Developing a schema for coordinating the flexibility afforded by distributed energy resources between transmission and distribution grids
- Analyzing the coupled transmission and distribution networks using both top-down and bottom-up methodologies
- Determining cost-effective grid reinforcement for all voltage levels in transmission and distribution systems under various scenarios
- Active participation in the scientific and public discourse (including publication of results in high-impact scientific journals)

Your Profile:

- A completed master's degree in the field of electrical engineering, informatics, or a related field of study
- Good knowledge of mathematical optimization methods
- Very good knowledge of energy technology and economics
- Proficiency in Python programming language
- High degree of independence and willingness to show great commitment
- Very reliable and conscientious work style
- Fluent written and spoken English; German language skills would be an advantage

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 at one of Europe's largest research establishments
- The opportunity to complete a doctoral thesis within three 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
- Outstanding scientific and technical infrastructure
- Opportunity to participate in (international) conferences and project meetings
- Continuous scientific mentoring by your scientific advisor(s)
- Flexible work (location) arrangements, e.g. remote work
- 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>
- 30 days of annual leave and provision for days off between public holidays and weekends (e.g., between Christmas and New Year)
- Working for one of the best employers in Germany – 6th place in the Glassdoor award for employee satisfaction: https://www.glassdoor.de/Award/Beste-Arbeitgeber-Deutschland-LST_KQ0,29.htm
- Targeted services for international employees, e.g., through our International Advisory Services

The position is for a fixed term of three years. Pay will be 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.

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

Questions about the vacancy?

Please feel free to contact us via our **contact form**. Please note that for technical reasons we cannot accept applications via email.

www.fz-juelich.de

6 BEST EMPLOYERS IN GERMANY 2023

