Shaping change: this is what drives us at Forschungszentrum Jülich. As a member of the Helmholtz Association with some 7,600 employees, we conduct interdisciplinary research into a digitalized society, a climate-friendly energy system, and a sustainable economy. We focus on the natural, life, and engineering sciences in the fields of information, energy, and bioeconomy. We combine this with expertise in high-performance computing and artificial intelligence using unique scientific infrastructures.

At the IInstitute of Climate and Energy Systems - Energy Systems Engineering (ICE-1), we're pioneering the next generation of models and algorithms to simulate and optimize integrated multi-energy systems. Our work lies at the intersection of energy, computing, and sustainability— tackling the complex challenges of a renewable-driven future.

As renewable energy grows and electrification accelerates, power grids face unprecedented stress. Recent large-scale outages, such as those in Spain, have shown just how vital resilient energy systems are—especially under extreme conditions.

To address these challenges, our High-Performance Computing (HPC) department is developing cutting-edge tools for exascale-enabled energy system simulation. Join us and help design the technologies that keep our energy systems stable, sustainable, and secure.

We are offering a

PhD Position - Ensuring Power System Security under Extreme Conditions using Exascale Computing

Your Job:
In this PhD project, you will shape the future of power system security by harnessing exascale computing. Your research will focus on understanding and enhancing grid resilience under extreme scenarios.

Your tasks:

- Conduct security and resilience studies for highly stressed systems (e.g., multiple faults, high renewable shares, or equipment failures).
- Evaluate system vulnerabilities and design recovery and stability strategies using

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

large-scale simulation workflows.
- Build and expand realistic, continent-scale power system models (e.g., the European transmission grid).
- Implement and test GPU-capable, parallelized simulation frameworks.
- Work closely with experts in HPC and power systems to enhance scalability and computational performance.
- Disseminate your findings through scientific publications, conferences, and collaborations
- Supervise Bachelor's and Master's students and represent the institute in national and international research contexts

Your Profile:
- An excellent Master's degree in electrical engineering, computational engineering, or a related discipline
- A strong foundation in power system modelling and simulation
- Solid programming skills (Python, C++, or comparable languages)
- Interest in high-performance computing, numerical simulation
- Fluent in written and spoken English
- Independent, analytical, and team-oriented working style

You are independent, motivated, and passionate about shaping the energy transition—if this describes you, we encourage you to apply!

Our Offer:
Join a diverse and supportive research group at one of Europe's leading research centers, where you will work on cutting-edge energy system models developing solutions for Europe energy system decarbonization. You will have access world-class infrastructure (including the Jülich Supercomputing Centre), and develop skills to advance your future career in academia or industry.

We offer ideal conditions for you to complete your doctoral degree:
- Pursue a PhD at RWTH Aachen University under the supervision of Prof. Benigni
- Access cutting-edge infrastructure, including the Jülich Supercomputing Centre
- Participate in projects, meetings, and international conferences
- 30 days of annual leave and flexible working arrangements, including partial remote work
- Strong support and mentoring for building a career in academia or industry
- Professional development through JuDocS, including training courses, networking, and structured continuing education (https://www.fz-juelich.de/en/judocs)
- Targeted services for international employees, e.g. through our International Advisory Service

The position is for a fixed term of 3,5 years, where the first 6 months serve as orientation and probation period. Pay is in line with 13 (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"). The monthly salaries in euro can be found on the BMI website: https://go.fzj.de/bmi.tvoed.entgelt Further information on doctoral degrees at Forschungszentrum Jülich (including its various branch offices) is available at https://www.fz-juelich.de/en/careers/phd

In addition to exciting tasks and the collaborative working atmosphere at Forschungszentrum Jülich, we have a lot more to offer (https://www.fz-juelich.de/en/careers/julich-as-an-employer/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.

The following links provide further information on diversity and equal opportunities: https://go.fzj.de/equality and and on the targeted promotion of women: https://go.fzj.de/womens-job-journey