



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 Energy and Climate Research – Energy Systems Engineering (ICE-1), we develop advanced models and algorithms for the simulation and optimization of decentralized, integrated energy systems.

Our research tackles one of the defining challenges of our time: how to design energy systems that are not only efficient and secure but also sustainable and fair.

Thanks to our campus infrastructure and collaboration with local municipality we are able to demonstrate our approach in field pilot projects.

We are offering a

PhD-Position - Design and Operation of Local Energy Communities

Your Job:

The concept of Local Energy Communities (LECs) — where people, businesses, and local infrastructure share and manage energy collectively — is reshaping how energy is produced and consumed. Recognized by the EU as a cornerstone of the Clean Energy Transition, LECs empower local actors to participate actively in energy markets, support renewables, and enhance system flexibility.

In this PhD project, you will help design, simulate, and optimize these next-generation communities — making clean, local, and intelligent energy systems a practical reality.

Your key responsibilities include:

- Developing and applying simulation and optimization models to analyze energy flows, operational strategies and design decisions in a multi-energy system (power, gas, heat)
- Investigating different community configurations (residential, commercial, mixed-use) and their interactions with distribution grids
- Assessing how renewable integration, storage technologies, and demand flexibility affect system performance

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

- Evaluating economic and environmental indicators such as cost, emissions, self-sufficiency, and flexibility under various policy scenarios
- Analyzing interactions to regional grids (heat) within local energy communities and interfaces to higher-level grids (electricity) for stable operation and effective market participation
- Supporting case studies with municipal and regional partners to bridge research and real-world application
- Disseminate your findings through scientific publications, conferences, and collaborations
- Supervise Bachelor's and Master's students

Your Profile:

- Excellent Master's degree in electrical or mechanical engineering
- Strong mathematical skills
- Experience in modelling energy systems
- Very good knowledge and experience in programming (e.g. Python, Matlab, C, C++)
- Fluent in written and spoken English
- Strong analytical and independent working style
- Excellent teamwork and communication skills

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.tvloed.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 on the targeted promotion of women:

<https://go.fzj.de/womens-job-journey>