



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 Climate and Energy Research - Energy Systems Engineering (ICE-1) we focus on the development of models and algorithms for simulation and optimization of decentralized, integrated energy systems. Such systems are characterized by high spatial and temporal variability of energy supply and demand as well as by a high degree of interdependence of material and energy flows. Research at ICE-1 aims to provide scalable and faster than real-time capable methods and tools which enable the energy-optimal, cost-efficient and safe design and operation of future energy systems.

**We are offering a**

## **PhD-Position - Planning, Simulation and Optimization of local energy communities**

### **Your Job:**

The concept of organizing energy systems in Local Energy Communities (LECs), which are coordinated across multiple energy sources, has gained considerable attention in recent years. LECs have been recognized by the EU as a key component of the energy transition to integrate the local coordination of energy supply and consumption into overarching systems and grids. The European Commission's Clean Energy Package has defined a legal framework for the operation of LECs, aiming at the participation of LECs in the energy markets. The coupling of multiple energy sources appears to be a promising solution to further reduce carbon emissions and maximize generation from renewable sources, but their coordinated operation is still a challenge.

Your tasks will include among others:

- Analysis of the current state of the art in the operation of energy communities and their interface with higher-level grids and systems (electricity, thermal and gas grids)
- Definition of methods for holistic coordination of LEC operation across multiple energy carriers - including electricity, heating and cooling as well as gas grids

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](http://www.fz-juelich.de)

- Optimization and simulation of local energy communities based on specific communities
- Evaluation of the possibilities for coupling different energy communities
- Supervision of Master and Bachelor students
- Representation in national and international networks
- Presentation of your research results at (international) meetings and conferences, as well as in the form of publications in relevant journals

#### **Your Profile:**

- Excellent university degree (Masters) in electrical engineering or a comparable degree
- Strong mathematical and programming skills
- Experience in modelling energy systems, preferably LEC
- Very good knowledge and experience in programming (e.g. Python, Matlab, C, C++)
- Excellent ability to work cooperatively
- Fluency in German and English language is necessary

With your application documents (CV, motivation letter, Bachelors and Masters ToR, any other relevant certificates), please also upload one document where you briefly explain your specific experience in/with:

Brief explanation of your knowledge in/with

- Modeling of electricity grids
- Modeling of gas networks
- Modeling of heating / cooling networks
- Modeling of energy markets
- Relevant optimization and simulation methods
- Mathematical and programming skills

#### **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:

- Possibility of pursuing a PhD at RWTH Aachen University supervised by Prof. Benigni
- A highly motivated research group in one of the biggest research centers in Europe
- An excellent scientific and technical infrastructure: both necessary conditions for a successful PhD thesis at RWTH Aachen within three and a half years
- Participation in project meetings and conferences
- Flexible arrangement with the option to work partly from home
- Strong support and mentoring for setting up a future career in science and/or the industry
- 30 days of annual leave and provision for days off between public holidays and weekends (e.g. between Christmas and New Year)
- A large research campus with green spaces, offering the best possible means for networking with colleagues and pursuing sports alongside 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>
- 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 half year serves as orientation

and probation period. 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“). All information about the Collective Agreement for the Public Service (TVöD-Bund) can be found on the BMI website: <https://go.fzj.de/bmi.tvöed>. The monthly salaries in euros can be found on page 66 of the PDF download.

Further information on doctoral degrees at Forschungszentrum Jülich including our other locations is available at: [www.fz-juelich.de/gp/Careers\\_Docs](http://www.fz-juelich.de/gp/Careers_Docs)

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