IEK-10 focuses 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 IEK-10 aims to provide scalable and real-time capable methods and tools which enable the energy-optimal, cost-efficient and safe design and operation of future energy systems.

We are looking to recruit a


**Ihre Aufgaben:**
Current transformations in Germany’s energy system lead to higher shares of renewable energies, more dynamic operation, and stronger coupling between different between subsystems such as for electricity, heating, and cooling. In this context, the scope of this thesis is to evaluate and optimize the heating and cooling supply’s role in a future multi-modal energy system. This involves modeling different technology options in the modeling language Modelica with the aim of evaluating energy demands, costs, and emissions. In addition, the coupling to other parts of the energy system like electric and gas grids is of particular interest. To facilitate usage of the models and visualize results, this work also involves collaboration on a web-based optimization platform.

**Ihr Profil:**
- Excellent university degree in computational engineering science, chemical engineering, mechanical engineering, electrical engineering, physics, industrial engineering, or a relevant discipline.
• Expertise in modeling of dynamic energy systems
• Expertise in the field of mathematical optimization
• Expertise in Python, Javascript, and Modelica is highly welcome
• High motivation for pursuing a PhD within 3 years
• Excellent organizational skills and the ability to show initiative and work independently
• Excellent cooperation and communication skills and ability to work as part of a team
• Excellent skills in spoken and written English

Unser Angebot:
• 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 within three years
• Participation in project meetings and conferences
• Strong support and mentoring for setting up a future career in science and/or the industry
• International, interdisciplinary working environment on an attractive research campus, ideally situated between the cities of Cologne, Düsseldorf, and Aachen
• A comprehensive further training programme, including English language courses
• Flexible working hours and various opportunities to reconcile work and family life
• Limited for 3 years
• Salary and social benefits in conformity with the provisions of the Collective Agreement for the Civil Service (TVöD). Salary grade 13 (50%) TVöD-Bund

Forschungszentrum Jülich aims to employ more women in this area and therefore particular welcomes applications from women.

We also welcome applications from disabled persons.

We look forward to receiving your application, preferably via our online recruitment system on our career site until quoting the above-mentioned reference number.