

Masterarbeit, Forschungsmaster  
am Institut für nachhaltige Energiesysteme

## Modeling and Emulation of Grid Dynamics for Resilience Analysis

### Challenges:

In this project, we investigate how the modern power grid, with penetration of distributed energy resources (DERs) and a correspondingly complex control and communication infrastructure, is affected by cyber-attacks. A representative model that captures both the physical and control aspects of the grid forms the foundation of this research. Based on this model, we assess the grid's resiliency under various attack scenarios using both simulation and power hardware-in-the-loop (PHIL) emulation methods.

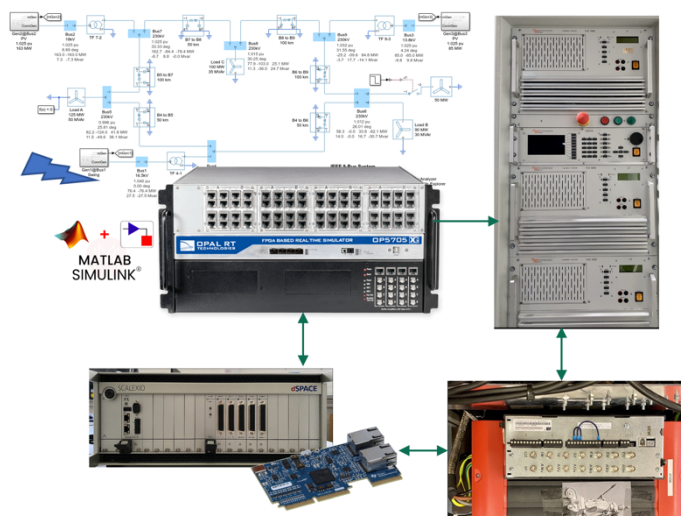
Not only software-based analysis but also hands-on hardware work will be included to provide a comprehensive understanding and support your technical capability development. The specific focus of the work can be tailored to your interests.

### What you can expect:

- Systematic learning by doing: literature research, modeling, implementation, and validation.
- Access to modern grid-emulation platforms with PHIL systems.
- Guidance and mentoring from experienced researchers.

### What should you bring?

- Interest in power systems and control.
- Prior experience with MATLAB & Simulink or Python is advantageous.
- Motivation to learn, experiment, and engage in discussions.



### Kontakt

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