Master's Thesis

Electrolyzer at „auf AEG“

Project Idea

On the area „auf AEG“ in Nuremberg an efficient energy sector coupling is to be implemented by an electrolyzer, hydrogen storage and fuel cell. Energy in the form of electricity, heat and gas is provided by the company Cenero GmbH and consumed by the customers. The operation of the electrolyzer and the fuel cell needs a dedicated controlling algorithmic that optimizes the operation in terms of cost minimization and component durability. The final system should be used as living lab for practical scientific research and is to be operated economically. The sector coupling is to satisfy the following objectives:

1. provision of hydrogen on the site and in the immediate vicinity. In this way, the site „auf AEG“ is to act as a hydrogen nucleus for Nuremberg.
2. provision of own energy to buffer price peaks or supply bottlenecks.
3. living lab for practical research of closed hydrogen solutions.

The first important step is to build a model of the process for a proof of concept that the system can be operated economically.
As a cooperation partner, the Energie Campus Nürnberg will co-supervise the master's thesis.
There is the possibility of temporary employment as a research assistant.

Tasks:

- modeling of the cost optimal electrolyzer operation as a (mixed-integer) optimization problem.
- identification of suitable solutions methods
- implementation and validation using real-world data
- robustification of solutions

Requirements

- basic knowledge in mathematical optimization
- programming skills (e.g. Python)

Contact

Kevin-Martin Aigner, Daniela Bernhard,
Prof. Dr. Frauke Liers

If you are interested, please write an e-mail (with your Transcript of Records, a short letter of motivation and the desired processing period) to wima-abschlussarbeiten@lists.fau.de.