

# Term Project

(Theoretical)

## Further development of an interactive interface for the district energy system models

### Description:

Energy system optimization models are a widely used tool to provide useful information on the pathway to achieve carbon reduction targets. Based on the given assumptions as well as the defined boundary conditions of the model, the most cost-effective pathway to reach climate goals is determined. Accordingly, these models are often used to support regional energy planning. As part of municipal heat planning, transformation plans are to be drawn up for all municipalities by 2028. In order to achieve these extremely ambitious goals, it is necessary to use optimization models to find a cost-optimal transformation path, which is heavily influenced by user-made assumptions. The aim of this project is to implement an online server to run custom scenarios for district energy systems. The graphical interface will give stakeholders the opportunity to easily test different assumptions (costs, CO<sub>2</sub> budget, carbon tax, biomass availability, etc.) and thus understand their influence on the decarbonization path. Furthermore, it gives the possibility to view precalculated scenarios quickly and interactively. The existing model is based on PyPSA. For the interactive interface the python package streamlit is used.

### Prerequisites:

- Interest in the transition of the energy sector,
- High motivation and independent, structured way of working,
- Knowledge or interest in Python programming.

### Work Packages:

- Getting familiar with the PyPSA model and streamlit
- Importing generators and links structure as data frames to the model and interface, thus they can be adapted.
- Automation of results visualization, (inst. capacity plots, costs emissions etc.)
- Documentation

**Beginn ab:** sofort

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