## Bachelor Thesis Topic
Research Group: Distribution Grid Planning & Operation

Date: 08.08.2025

Development of a graphical user interface for the Power System Data Model (Bachelor Thesis)

Background: Due to the expansion of decentralised energy generation plants and new, flexible loads with high connection capacities, the supply task in the distribution network has changed in recent years. Detailed models for energy system modelling and network calculation are required to take account of this change in behaviour. The ie³ has developed the PowerSystemDataModel (PSDM) for this purpose. For details, please check https://powersystemdatamodel.readthedocs.io/ and https://github.com/ie3-institute/PowerSystemDataModel).
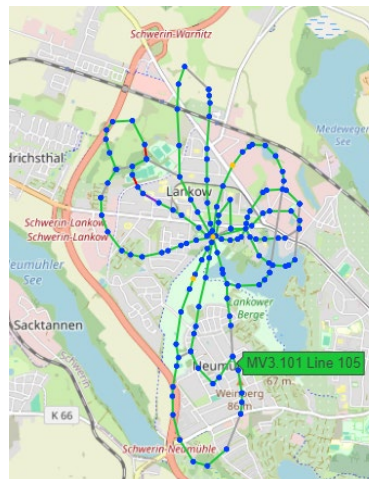
The goal of this thesis is to develop a software prototype that can be used to make graphical changes to this grid model. The grid and its participants, such as loads and photovoltaic systems, nodes and lines, transformers, etc. should be possible to visualise. Furthermore, the user should be able to edit grid data smoothly, e.g. via drag-and-drop, and these changes should be transferred to the PSDM accordingly. The prototype will be validated and tested.

General conditions and resources provided:

- The work requires advanced programming skills (ideally in Python).
- This work is also available to students from other degree programmes (e.g. computer science, mechanical engineering).

On the part of the supervising institute: For the research conducted as part of the thesis, the institute will provide the student with all relevant preparatory work, e.g. in the context of the PSDM, software and the research already carried out on it. In addition, the student will be given access to the code base and all existing information relating to the PSDM.

Following this work, a presentation must be given on the results achieved.

Responsible:

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