Institut für Automatisierungstechnik

Master Project/Thesis

Modeling of a district heating and gas network

Background Integration of intermittent renewable energy sources in the traditional energy system introduces several challenges. In response to these challenges, multi-energy systems are considered to have the potential to secure sustainable energy supply for existing and new building and districts. However, analysing such non-linear systems with the mix of multiple energy carriers require detailed mathematical model.

This thesis aims to model a detailed heating and natural gas supply network for a district of 40,000 people. The model should have the possibility to be integrated with a medium voltage (20 kV) electrical network.

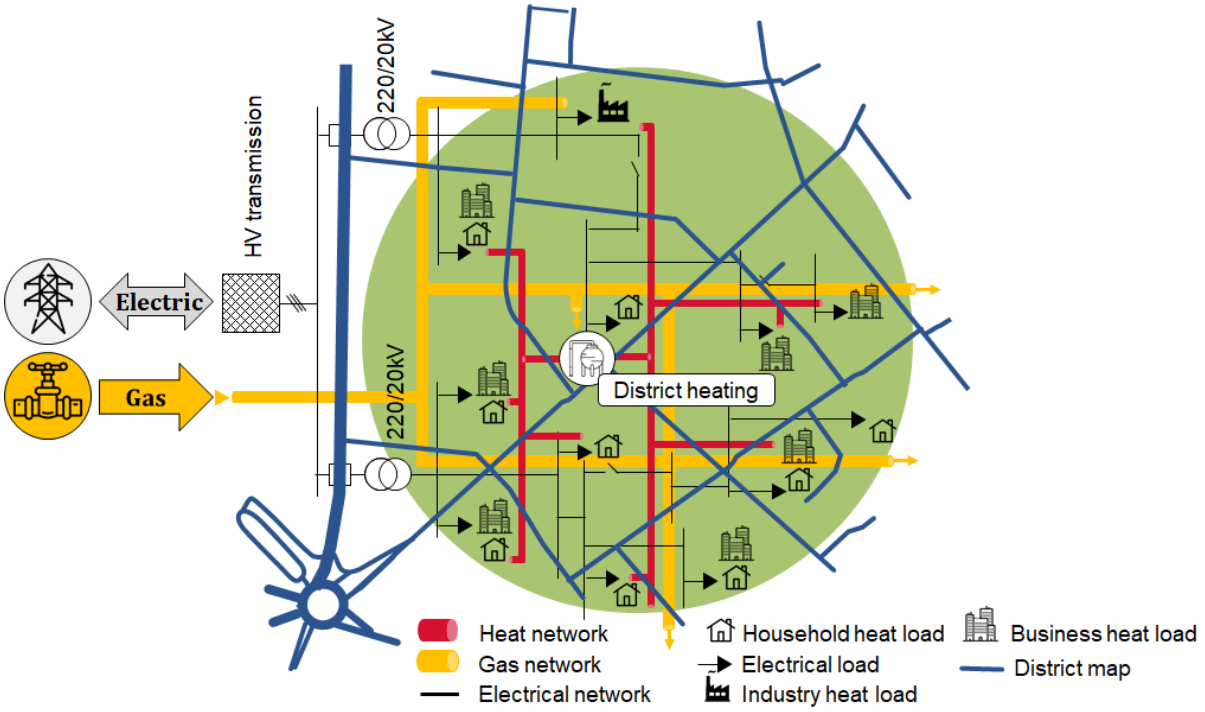

Figure 1: District multi-energy system network with energy consumers

Research objectives

1. How can the electricity, natural gas and heating networks be modelled in order to be integrated in a comprehensive multi-energy system model to study the quasi-dynamic behaviour of a district multi-energy system?

Desired competencies:

1. Excellent scientific writing and communication skills
2. Good knowledge on Python, Pandapower and mathematical optimisation
3. Independent work

If interested, please send your short application with CV (one page) and transcript to the below mentioned email address.

Adnan Shihab | shihab@iat.uni-bremen.de | +49 (0) 421 218 62476

Universität Bremen