Open Source Modelling and Optimisation of Energy Infrastructure at Urban Scale

This thesis presents several mathematical optimisation models for cost-minimal expansion and operation planning of energy systems. These models are applied in several case studies on individual neighborhoods and entire cities to perform a preliminary planning for infrastructure networks. Both the planning of individual infrastructure networks (district heating, district cooling) and the combined planning for multiple energy sources (electricity, heat, natural gas) are considered. This work shows that the combined planning can uncover still untapped potential synergies.