

Masterthesis:

Innovative optimization of the energy system of existing buildings

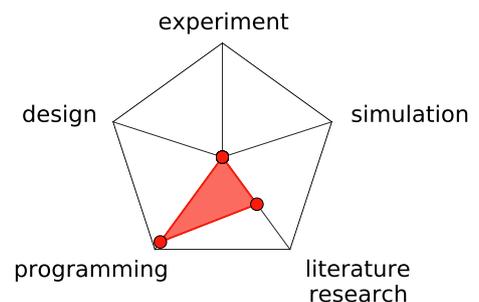
With 40 %, the building sector significantly contributes to the worldwide CO₂ emissions. For this reason, Germany has set itself the goal of achieving a virtually climate-neutral building stock by 2050. Various electricity and heat supply systems can be used to increase efficiency and to integrate renewable energies into existing buildings.

At the Institute for Energy Efficient Buildings and Indoor Climate (EBC) an optimization model is being developed which, in addition to the optimal combination and configuration of these systems, also determines their optimal time of implementation and thus a modernization schedule. Within this model, future technical, ecological and economic boundary conditions play an important role. However, the forecasts for these boundary conditions (e.g. energy prices) are widely spread. The resulting uncertainty of the modernization schedule is to be considered within the optimization model in the future.

Your task:

The goal of this thesis is the implementation of a method for uncertainty analysis and the consideration of the effects on the optimization model as well as the generated modernization schedules.

First, promising methods of the current state of research are to be determined by a literature search. After a familiarization with the existing model and the basics of the topic, the central aspect of the work follows with the development of the concept and its implementation. As the existing model is written in Python, basic knowledge is helpful but not mandatory. Finally, the extended model is applied to different buildings, the results are discussed and the procedure is documented.



Our profile:

The E.ON Energy Research Center at RWTH Aachen University (ERC) is concerned with sustainable energy supply concepts that take into account technical feasibility as well as social and economic aspects. Among others, the reduction of the primary energy consumption of buildings and an increase of the interior quality in buildings are research tasks.

If you are interested, please contact us by phone or mail with your curriculum vitae and grades.

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