

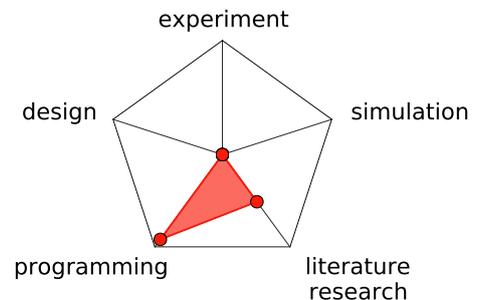
## Bachelorthesis:

### Life-Cycle Assessment for the holistic consideration of CO<sub>2</sub> emissions in the modernisation of existing buildings

The modernisation of the German building stock plays a key role in achieving the German climate targets. In the life cycle of a building, approximately 55 % of the emissions are emitted during construction in the form of indirect emissions contained in the material, 40% during operation through direct use of energy sources and 5 % are due to the disposal of the building. However, the influence of modernisation measures on these proportions within the life cycle of a building has been little researched to date.

#### Your task:

The aim of this thesis is the development of a Life Cycle Assessment (LCA) for modernization measures in non-residential buildings. First of all, the data basis necessary for a life cycle assessment is to be created by determining the specific CO<sub>2</sub> emissions of building components. After the familiarization with an existing calculation model for the determination of modernization measures and the basics of the topic, the central aspect of the work follows with the development of an LCA-concept and the extension of the model by the componentemissions. The existing model is written in Python, so basic knowledge is helpful but not mandatory. The further developed model shall be applied to different types of buildings and the shares of direct and indirect emissions shall be analysed. The results will be finally discussed and the procedure 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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