

Thesis

Development of a scenario study for the development of neighbourhood energy systems



Initial situation

The mobility and energy transition is key to achieving climate protection targets. Urban areas have high potential for renewable energies and sector coupling due to their energy requirements and infrastructure density. Numerous solutions exist, from PV systems and heat pumps to sharing services and virtual power plants. In practice urban neighbourhoods have so far failed to live up to their pioneering role. Obstacles are (1) *decision-making* between competing solutions against the background of local conditions, (2) a lack of strategic perspective on sector coupling due to increasing *decentralization* and (3) *conflicting objectives* between ecological, economic and social targets, e.g. the shift from environmental impacts due to CO₂ emissions from operation to resource requirements in the production of energy technologies. These challenges are addressed in the *adjust* research project with a digital tool that is intended to support the participatory and multi-criteria planning of post-fossil and multi-sectoral energy and mobility in the neighbourhood using the example of Herne.

Objective

The aim of this thesis is to identify possible future developments in neighbourhood energy systems by using a scenario study. As part of these studies, workshops and/or expert interviews will be conducted in addition to the literature research to collect influencing factors and put the identified key factors in relation to each other.

Procedure

The following steps should be considered in the scenario study:

- Carrying out an analysis of the current situation and defining areas and factors of influence in an expert workshop
- Determining the key factors by creating an influencing factor matrix
- Definition of future projections for the key factors, considering technology-specific learning curves and forecasts
- Performing a consistency analysis
- Development and interpretation of scenarios including identification of trend break events
- Development of recommendations for action and strategic measures

What you bring along

- Interest in sustainability topics
- Prior knowledge of the technologies and challenges of the energy transition
- Structured and systematic way of thinking and working
- Experience in organising workshops desirable
- Experience with scenario software, preferably completion of the elective module "Scenario analysis"

If you have any questions, feedback or interest, please contact:

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