

HOW PROSUMER BEHAVIOUR INFLUENCE THE STABILITY OF AN ELECTRICITY NETWORK



Research Focus

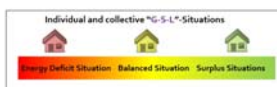
Which circumstances on the individual and the collective level favour which choice of action for Prosumers in a Future Energy Community?

How should a Crowd Energy Community be designed to achieve individual and collective goals?

How should a recommendation system for network stability in a Crowd Energy look like?

Situation

- Shift from the traditional Electricity market towards Micro Grids Organisation.
- Decentralized individual Energy Generation.
- Energy-Storage technologies increase individual self-sufficiency.
- Information & Communication Technologies enables efficient Load Management.



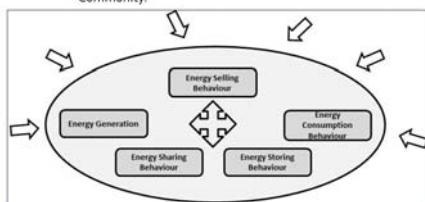
Problems

- Even when identical "G-S-L"-Situation, the choice of action to take to rebalance energy-household will differ from one Prosumer to the other.
- Larger spectrum of action for prosumers (Micro-level) leads to tougher network-stability predictions for a crowd (Meso) and the backbone (Macro).
- Individual decisions are shaped by- and embedded in- social environments
- Classical economic behaviour experiments give insufficient answers.
- Network predictions are only feasible, by considering individual energy behaviour patterns under given environmental/social restrictions.



Research Methods

- Defining the concept of Energy Prosumer Behaviour
- Defining variables which affect Prosumer choices.
- Group-Experiments under different circumstances.
- Agent-based Simulation of a Crowd Energy Community.



Research Outcome

- Energy Prosumer Behaviour Framework
- Prediction Tool for a Crowd Energy Community based on individual behaviour forecast.
- Network Stability "Warning System" for a Crowd Energy Community.
- Design Recommendation for different types of Crowd Energy Communities.

