Human Centric View on Cybersecurity in Crowd Energy Environments

Mahsa Rahimi, Prof. Dr. Stephanie Teufel

Research Focus

- Establishing a cybersecurity framework for Crowd Energy communities
- Defining risk management for cybersecurity in Crowd Energy systems
- Evaluating proposed framework by simulation experiment

Background

- Cybersecurity quality
  - Cybersecurity quality of Crowd Energy systems is defined as the level of safety and liability in exchange of energy, data and money in Crowd Energy Communities.
  - Some research was already done in the area of cybersecurity [1,2]. However, these findings do not include an evaluation of cybersecurity in Crowd Energy communities.
  - Besides, there are suggestions to improve information security in energy market [3]. Nevertheless, so far no one measured the cybersecurity quality of already existing infrastructure in Crowd Energy systems [4].

- Cybersecurity risk management
  - There is a gap in research to define a framework in which most priority cybersecurity issues identified and listed [5].

Research Outcomes

- A framework to measure the cybersecurity quality of Crowd Energy environment.
- Ranking possible threats related to cybersecurity in Crowd Energy systems and identifying priorities for precautionary actions.
- A simulation for evaluating the exchange of data and energy.

Research Questions

- Cybersecurity quality
  - How could the cybersecurity quality of Crowd Energy communities be measured?
  - To which degree are already existing cybersecurity infrastructure in Crowd Energy environments reliable?
  - How should a Crowd Energy Community be designed in order to be secure against cyberattacks?

- Cybersecurity risk management
  - Which area of Crowd Energy environment have more potential to be attacked?

Simulation

- How to simulate cyberattacks in Crowd Energy systems (as part of evaluating the proposed framework)?

Research Methods

- Experimental methods for defining the concept of a cybersecurity framework in Crowd Energy systems.
- Simulation of data and energy flows in a Crowd Energy system.