

# **Optimized Sector Coupling in Districts through Intelligent Thermal Prosumer Networks**

Daniel Zinsmeister<sup>1</sup>, Thomas Licklederer, Peter Tzscheutschler, Vedran Perić <sup>1</sup>d.zinsmeister@tum.de

## **Project Idea:**



Prosumer based District Heating System



- + Minimize transfer losses
- + Integrate decentral heat sources



Conventional District Heating System

### **Project Goals:**

- Develop and analyze new, innovative topologies for thermal grids and their bidirectional transfer stations
- Design suitable operation strategies
- Build a **demonstrator**
- Evaluate the interaction with the **electricity sector**

#### **Operation Strategies** Microgrid **Component Level** Bidirectional Transfer Station Central Controller **Decentral Controller** Network Operation Energy Management Systems, ... (e.g. Local Energy Market) **Simulation Models CoSES** Laboratory Model validation SF1 $\exists$

# Approach:



# **First Results:**

SF2

- Characteristics and challenges in prosumer-dominated thermal networks / CISBAT 2021
- A Comparison of Prosumer System Configurations in District Heating Networks / DHC 2021
- Thermohydraulic Model of Smart Thermal Grids with Bidirectional Power Flow between Prosumers / Energy 2021
- ProsNet a Modelica library for prosumer-based heat networks: description and validation / CISBAT 2021
- Modeling of Combined Heat and Power Generation Unit for Dynamic Analysis of Integrated Thermal-Electric Grids / MSCPES





Bundesministerium für Wirtschaft und Energie

aufgrund eines Beschlusses

des Deutschen Bundestages

Gefördert durch: