

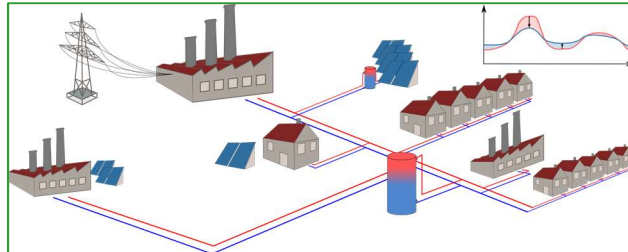
# Paid Master's Thesis

## Active Demand Side Management in Heating Networks

To dedicated students (m/w/d) of electrical engineering, information and computer engineering, or related disciplines we offer the opportunity to write a paid Master's thesis. The thesis will be conducted in cooperation with the Institute of Automation and Control, Graz University of Technology.

### Motivation:

**Heating networks** provide an ideal infrastructure to distribute energy from renewable energy sources or waste heat to many consumers. The problem of variability in heat production from renewables can be reduced by integrating centralized or decentralized heat storage.



The master's thesis deals with an innovative approach called **demand side management (DMS)** to actively interact with the consumers and shift their demand. The aim of this approach is to bring heat production and demand into closer agreement to **minimize costs and CO<sub>2</sub> emissions**.

### Objectives:

- Literature review on demand side management in heating networks
- Based on data from real networks, develop a mathematical model representing heat consumption and the influence of various DSM strategies for single consumers and groups of consumers. Develop a strategy to update the current state of the system and incorporate new information to improve the (possibly stochastic) model predictions
- Implement the developed strategies in an existing optimization framework
- Test the developed models and strategies on a co-simulation of the optimization framework and a detailed heating network simulation

### Your profile:

- Studies in electrical, mechanical or information and computer engineering, etc.
- Ideally with some background in control engineering or optimization
- Basic knowledge of MATLAB, Python or (ideally) Julia

### Our offer:

- Integration into a dedicated team
- Intensive support
- Perspective of participation in follow-up projects after successful completion
- Financial compensation based on student staff salary scheme

**In the interest of diversity, applications from women are especially welcome at BEST!**

### Contact us:

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