

Paid Master's Thesis

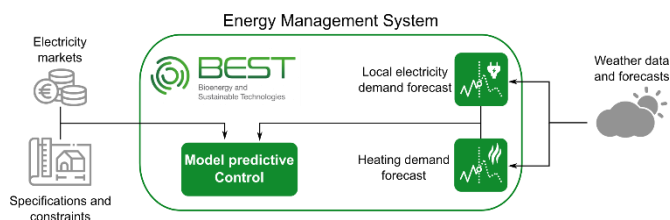
Considering Energy Markets in Energy Management Systems

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:

Electrical energy production always goes hand in hand with heat production. However, heat demand does not always occur at the same time as electrical power demand, or at the same time as high prices for energy can

be obtained when participating in **energy markets** (e.g., intra-day). How to optimally use flexibilities in the network by considering forecasts for, e.g., the future heat demand and energy prices, is the main question of this master thesis. An existing optimization-based **energy management system** (EMS) should be extended such that energy markets are considered explicitly in the **optimization problem**.



Objectives:

- Literature review on electricity markets in Austria/Europe (day-ahead, intraday, balancing market) and their representation in (stochastic) optimization
- Based on data from real heating networks, develop mathematical models that can be used to represent the participation in selected markets in an optimization problem based on stochastic mixed-integer linear programming
- Implement the developed models in an existing optimization framework
- Test and validate the developed models and strategies based on historic demand profiles and market price data

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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