

Master's Thesis

Development and impact assessment of trading strategies for local energy markets

Background

The European energy markets have been under a lot of pressure lately. The steady increase of new generation technologies, such as wind and solar, as well as new storage systems and consumers such as electric batteries and vehicles, create a significantly different technical framework than what the markets were designed for. To decrease the mismatch between economics and technology, the idea of local energy markets (LEMs) is increasingly discussed. LEMs allow the trade of energy at a local grid level, thus representing the grid and its limitations better. However, if trading moves into lower grid levels, this also puts more responsibility on the individual consumer as they would need to acquire their energy themselves. This means that they would need to develop trading strategies to optimize their energy portfolio instead of having a wholesale electricity retailer take care of this task.

Research Questions

- What trading strategies are suitable for local energy markets?
- How do they impact the grid stability and the market clearing?
- How do different combinations of trading strategies impact the market as well as the individual?

Requirements

- Strong interest in and knowledge of energy markets
- Fluent in German or English (thesis can be written in either language)
- Programming experience in Python is of advantage

Main goals

- Literature review of trading strategies and energy markets
- Development of suitable trading strategies for local energy markets
- Implementation of new trading strategies in HAMLET
- Simulation of various scenarios and trading strategy combinations
- Analysis, discussion and presentation of results

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