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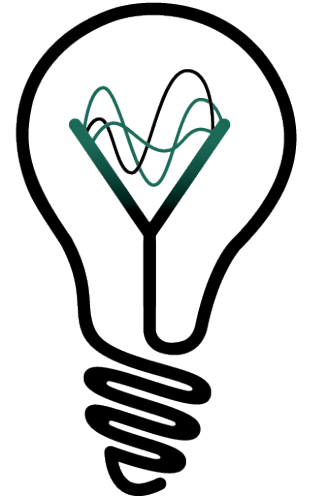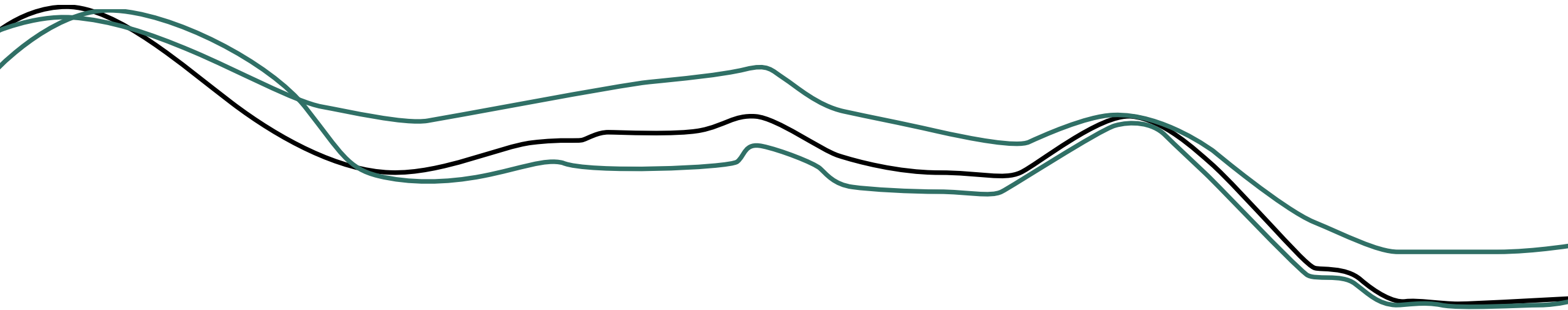
ENERGY DATA HACKDAYS

16-17th of September 2023 in Brugg, Switzerland

Forecast for Building management flexibility

Short Description
A single-family homeowner has several options to economically leverage their energy flexibility. Two key approaches include:

- **Self-consumption optimization** using a battery (Flexibility Product 1)
- **Participation in the balancing energy market** by providing the battery for grid-supporting services (Flexibility Product 2)

The challenge: **When** should each product be used – and for how long?

This decision should not be made manually, but rather fully automated. The two products mentioned are just a subset of several flexibility options that are generally available.

Forecast for Building management flexibility

What – What is being done?
The goal of the project is to develop an intelligent, data-driven system that automatically determines which flexibility product should be used, when, and for how long. The system aims to maximize both the customer's economic benefit and the contribution to grid stability.

Why – Why is this important?
The energy landscape is rapidly evolving – becoming more decentralized, digital, and dynamic. This opens up new opportunities for end users to actively participate in the energy market, provided they have the right tools. This project demonstrates how an intelligent system can:

- Maximize the **economic return** from existing assets
- Reduce **technical complexity** for the user
- Support **grid operators** in stabilizing and optimizing the power grid

Forecast for Building management flexibility

How – How is it implemented?
The project follows a multi-layered, data-driven approach:

- **Consumption Forecast**: Predicting the energy usage of key building systems for the next 14 days
- **Production Forecast**: Estimating PV generation over the same period
- **Market Forecast**: Assessing the potential revenue from battery participation in the secondary balancing market
- **Profitability Analysis**: Calculating savings from optimized self-consumption
- **Decision Algorithm**: Developing a decision tree model that automatically determines when and how the battery should be used to maximize total value for both the customer and the grid