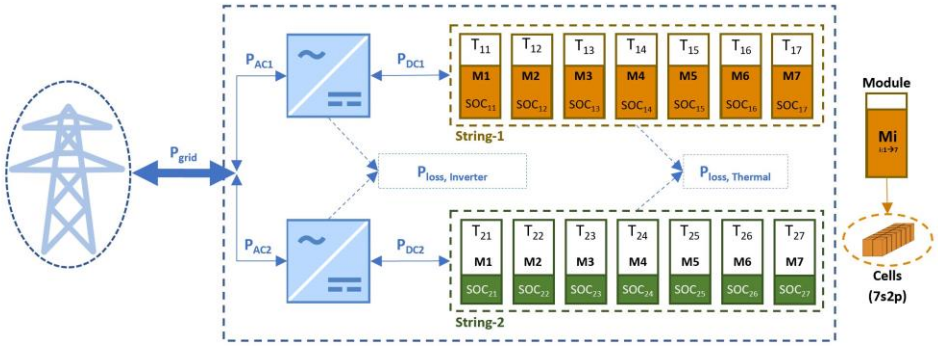
Master Thesis: ***Integration of battery cooling models into an MPC optimizer for optimal power split control among BESS strings (and modules).***

During the operation of battery energy storage systems (BESS), state of charge (SoC) and temperature play a crucial role in the aging and capacity degradation of the battery modules (and cells). To curtail such adversities, the charge or discharge power entering the BESS should be optimally distributed among these modules. One approach towards achieving this optimality is dynamically balancing the SoC and Temperature among these modules.

What's already there:

- A python based MPC optimizer which achieves SoC and Temperature balancing.
- Basic 1D and 2D finite difference models (FDM) models for battery string cooling and module cooling.



What needs to be done:

- Further development and integration of battery thermal model (existing FDM or any other) into the optimizer.
- Validation of the thermal models for battery cooling with the real time Grafana field data.

Requirements:

- Background in Thermal Engineering
- Strong affinity towards Python (or MATLAB)
- Awareness about batteries and their scientific terminology
- Open mindedness and enthusiasm

This topic will be co-supervised by **TUM** and **Hochschule Kempten**. If you are interested in this topic or are curious about having an open discussion, please feel free to contact:

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