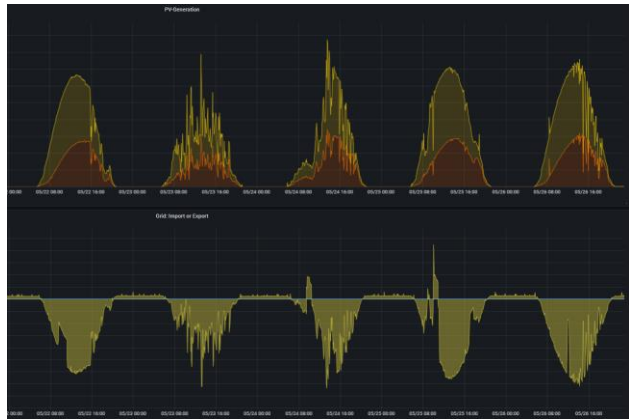


## Master Thesis

### Smart Charging - Development of an optimized charging management system

The transformation of the energy system requires an adjustment of our electricity consumption to the availability of renewable energy. At the same time, it is important to use renewable electricity efficiently and to decarbonize our transport sector. Intelligent charging of electric vehicles plays a key role in this. The average parking time for private cars is around 23 hours per day. This period must be used for CO<sub>2</sub>-free and cost-optimized charging.



The objective of this work is to develop a cost-optimized algorithm to manage the existing charging infrastructure. The control of the wallboxes will be realized with Python. On the one hand, the algorithm has to adapt the charging processes to the power generation of the PV-system. On the other hand, the charging process has to be optimally controlled depending on the electricity price on the stock market and the grid situation. Forecasting and innovative user integration will be analysed to identify previously unused potential.

## Your tasks

- You work in the team of the energy-management-system lab at the Campus Feuchtwangen
- You develop an interface for communication and control of wallboxes
- You analyze real user data
- You develop an algorithm for cost-optimized charging of electric vehicles with innovative methods for user involvement

## Necessary knowledge

- Programming skills in Python / LabVIEW
- High motivation in sustainable energy systems as well as a self-motivated approach to work
- Knowledge in the field of data-interfaces and -communication (RS485, Modbus RTU Modbus TCP, ...)
- Own ideas and creative approaches to solutions

Start: Possible from now

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