



Project Study

Marketing Virtual Power Plants Composed of Small Home Storage Systems

Background

Energy Storage is an enabler in the transition to carbon-neutral energy system. Already today, battery parks are supplying half the power in Germany's market for frequency control. In the coming years, home storage systems will be instrumental in increasing self-consumption of power from residential PV installations. Siemens offers the home storage system *Junelight Smart Battery* with a connection to the *Junelight Cloud* via the homeowner's DSL connection.

This connection enables the bundling of several batteries into a Virtual Power Plant (VPP), with the potential to earn some extra revenue for the homeowner and the operator. To make this concept cost efficient is a challenge in the light of the small granularity of storages, complex measurement of power flows in dual use cases, and security requirements.

Research Tasks

1. Analyze potential German markets where the flexibility of home storages bundled to a VPP can be offered. Candidates are various spot and reserve markets.
2. In Germany, due to the metering concept, unidirectional charging or discharging might be a preferred option. Identify markets, for which this concepts are viable.
3. Compare Germany with other countries that might offer better opportunities for VPPs.
4. Investigate opportunities connected with the rollout of smart meters in a dual use case?
5. Investigate the question how an ideal measuring and meter concept would look like. This question focuses on distinction of power flows between PV, consumption, PV power self-consumption optimization and power supply, and absorption for market participation.

This project study is co-supervised by the *Siemens AG*. The selection of a suitable candidate and the detailed specification of the project will take place in close cooperation with *Siemens*.

Qualified applicants are invited to send their electronic application to cem@wi.tum.de.