

SmartFab

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The SmartFab is a packaging lab for electronic systems with potential to utilize storage of energy and generation of renewable energy on KIT's Campus North.

Social aspects

- Main users are the technical staff, PhD-students and students running the production processes.
- The users are very open and interested in the new technologies.

Environmental aspects

- Western European climate
- Local wind production (on site) not commercially reasonable. Various wind turbines located in the region
- Local solar production available

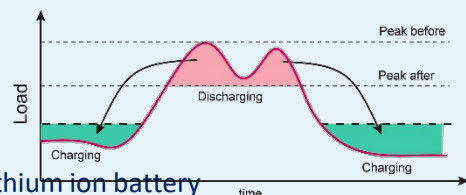
Economic aspects

- Current electricity rates are 0.09 €/kWh, with approx. 0.02 €/kWh for environmental tax.
- Grid usage is invoiced with 0.05 €/kWh for users without smart power meters. With power meter, the prices are:

Annual Useful time	Max. Power €/kW/a	Annual Electricity €/kWh
$\frac{\text{Annual Electricity}}{\text{Max. Power}} < 2500 \text{ h}$	30	0.04
$\frac{\text{Annual Electricity}}{\text{Max. Power}} \geq 2500 \text{ h}$	70	0.02

Technological aspects

- The electrical energy mix in Germany is currently generated by approx. 40% from renewables. The rest is provided by coal, gas, oil, nuclear energy, etc.
- Battery and photovoltaics will be integrated into local low-voltage grid for peak shaving.

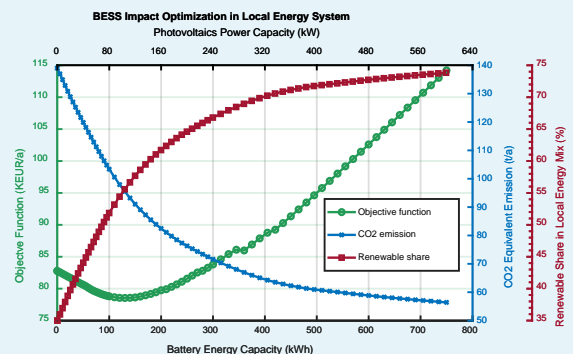


Lithium-ion battery

- Store redundant renewable energy and shave peak power.
- Trade-off between the performance and the investment cost of the system.

Results

- By the installation of a 130 kWh battery and a 100 kWp PV plant, the operational costs can be minimised and the CO₂ emissions are reduced by over 35%.



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