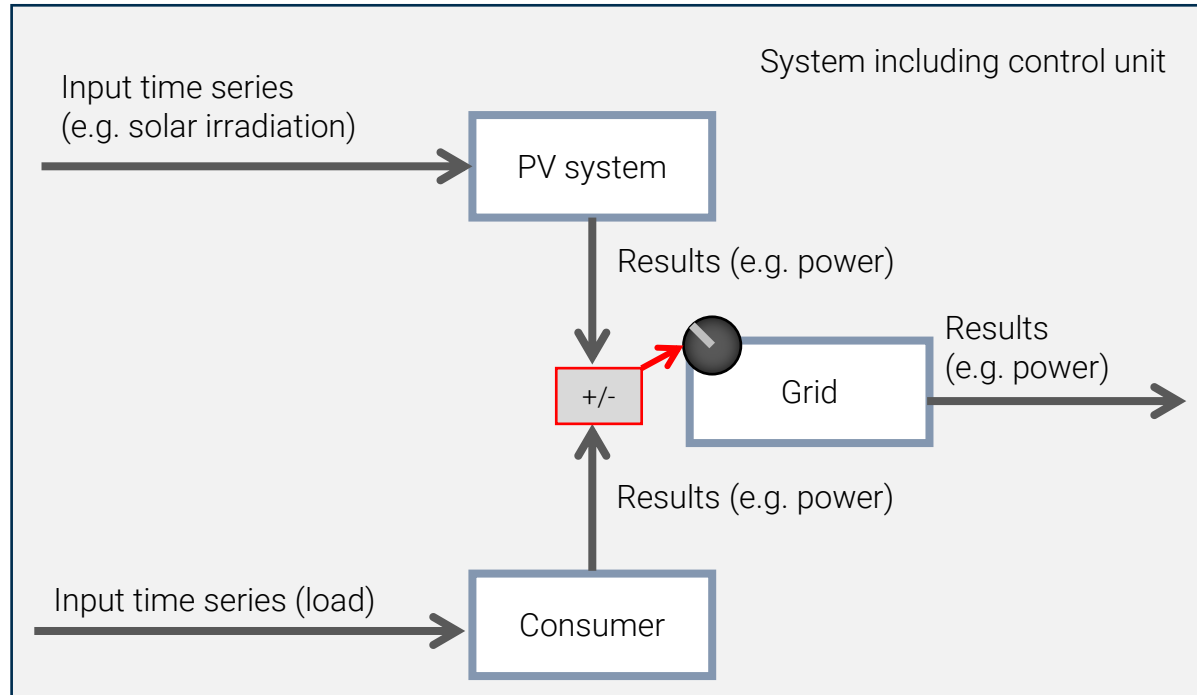

What is SMOOTH?

Laura Wienpahl, Tim Röpcke



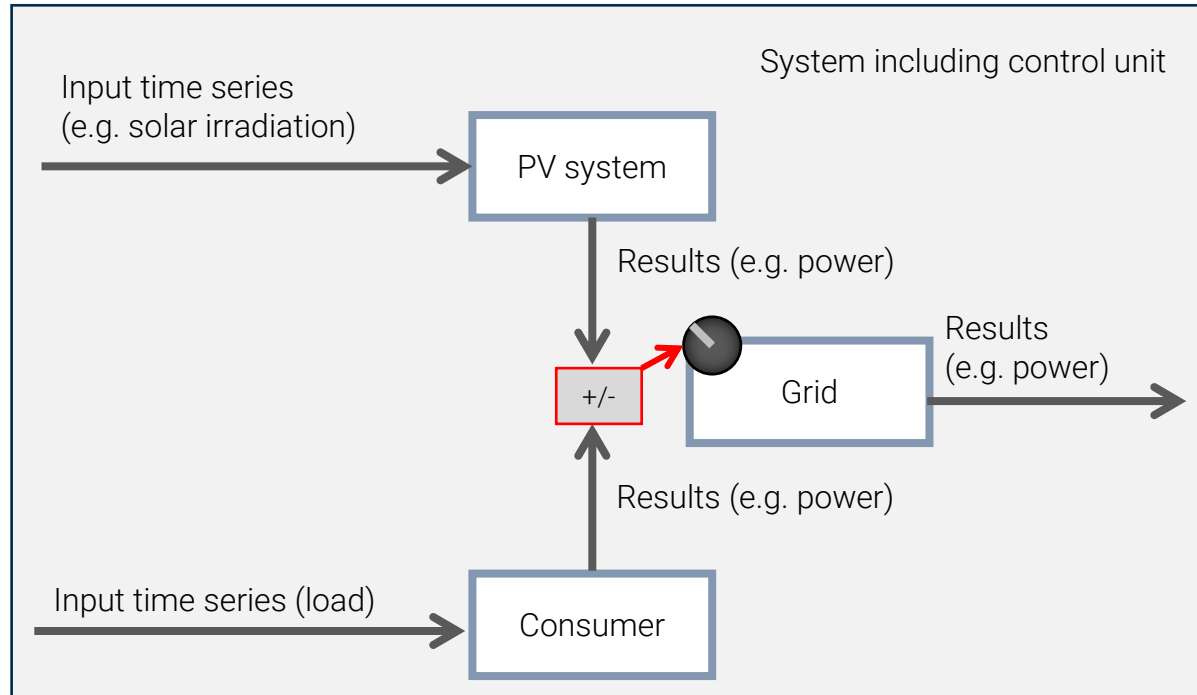
- ▶ **SMOOTH** (**S**imulation **M**odel for **O**ptimized **O**peration and **T**opology of **H**ybrid Energy Systems)
- ▶ Simulation framework, developed in MATLAB to simulate energy systems with non-linear behaving components
- ▶ Includes specific components for hydrogen topologies, e.g. electrolyzer, hydrogen storage and compressor
- ▶ Operation of the system in each timestep is cost-optimized
- ▶ Not perfect foresight

Example



- The system is divided into balancing groups
- Functional parameters and initial states are set
- For every time step all balancing groups must be equalized
- There are controllable and non-controllable components

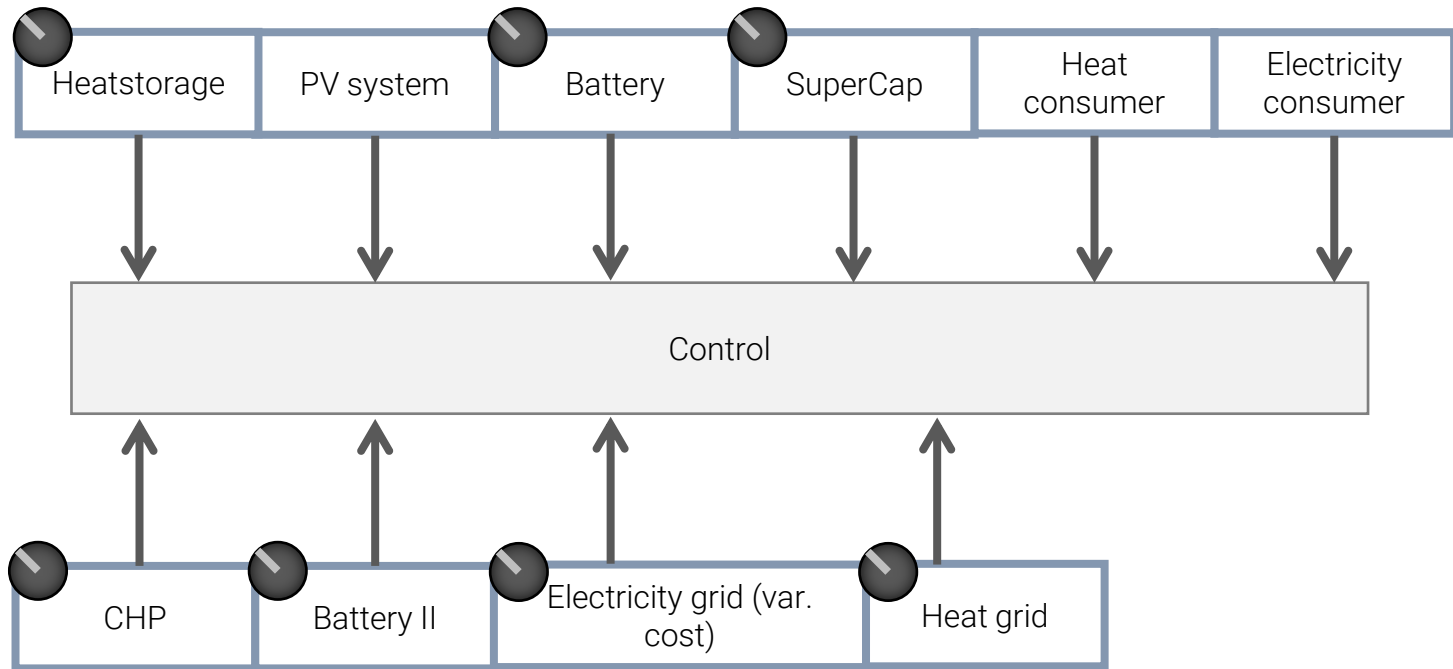
Example



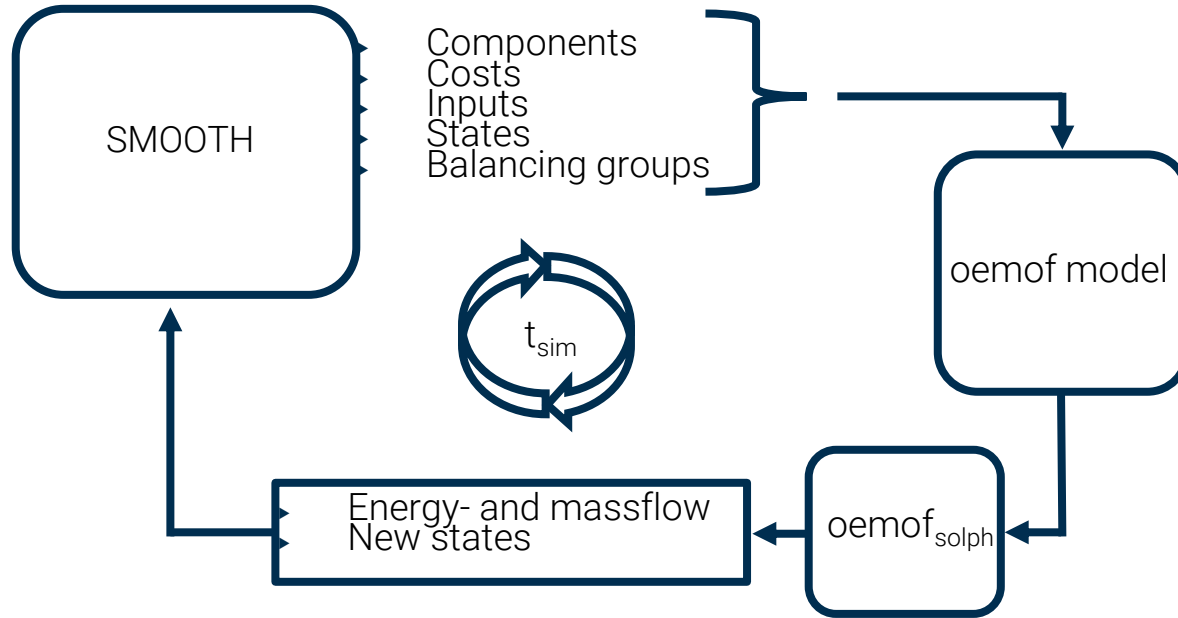
- There are artificial costs, to influence the system behavior
- e.g. the grid gets high artificial costs to first take all energy from RE and secondly out of the grid to satisfy consumer needs

How it works

Central control



Basic concept with oemof



Thank you for your attention!



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