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Cooperative Operation of Chemical-free Energy Storage System for Green Building

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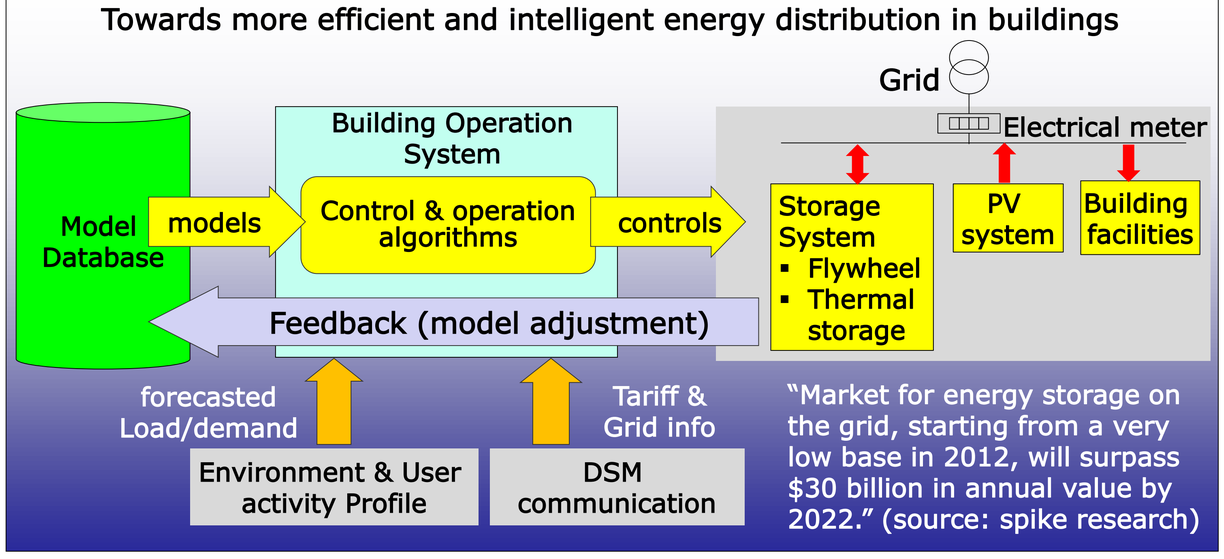
Motivation

- To ensure the building operation system not only "green" to the building owner/end user, but also "green" to the grid and society as a whole
- To operate a chemical free energy storage system to shape the demand load
- To benefit the building owner/end user with low energy bills without comprising the indoor comfort

Background

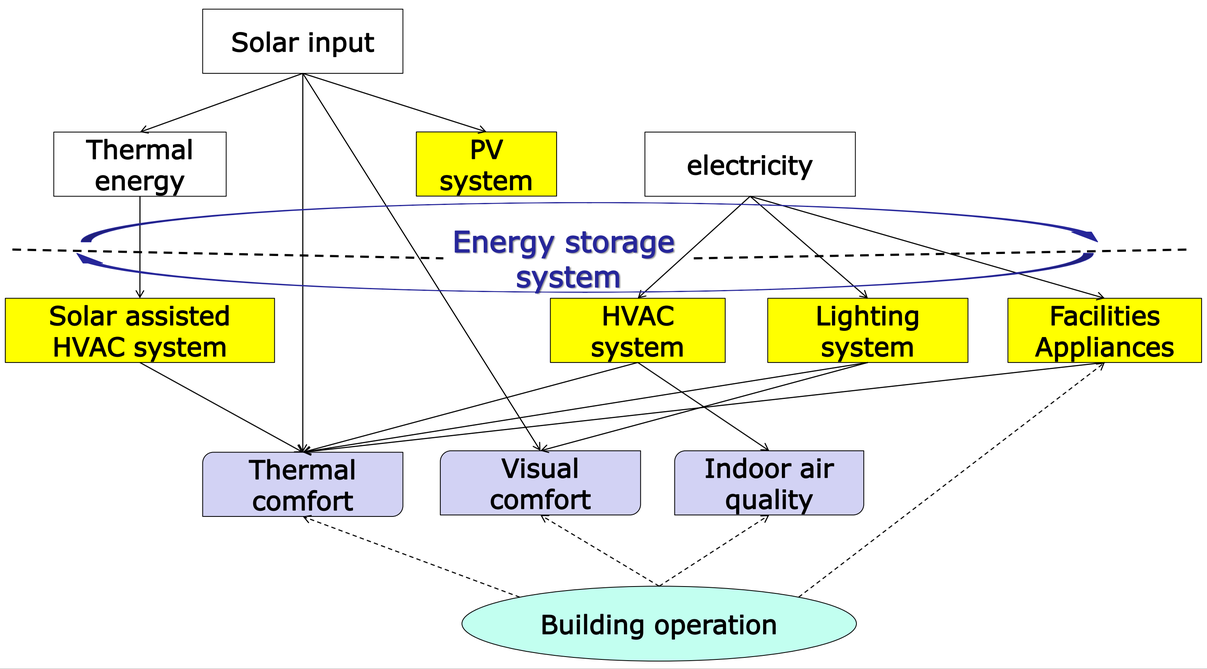
Towards more efficient and intelligent energy distribution in buildings



"Market for energy storage on the grid, starting from a very low base in 2012, will surpass $30 billion in annual value by 2022." (source: spike research)

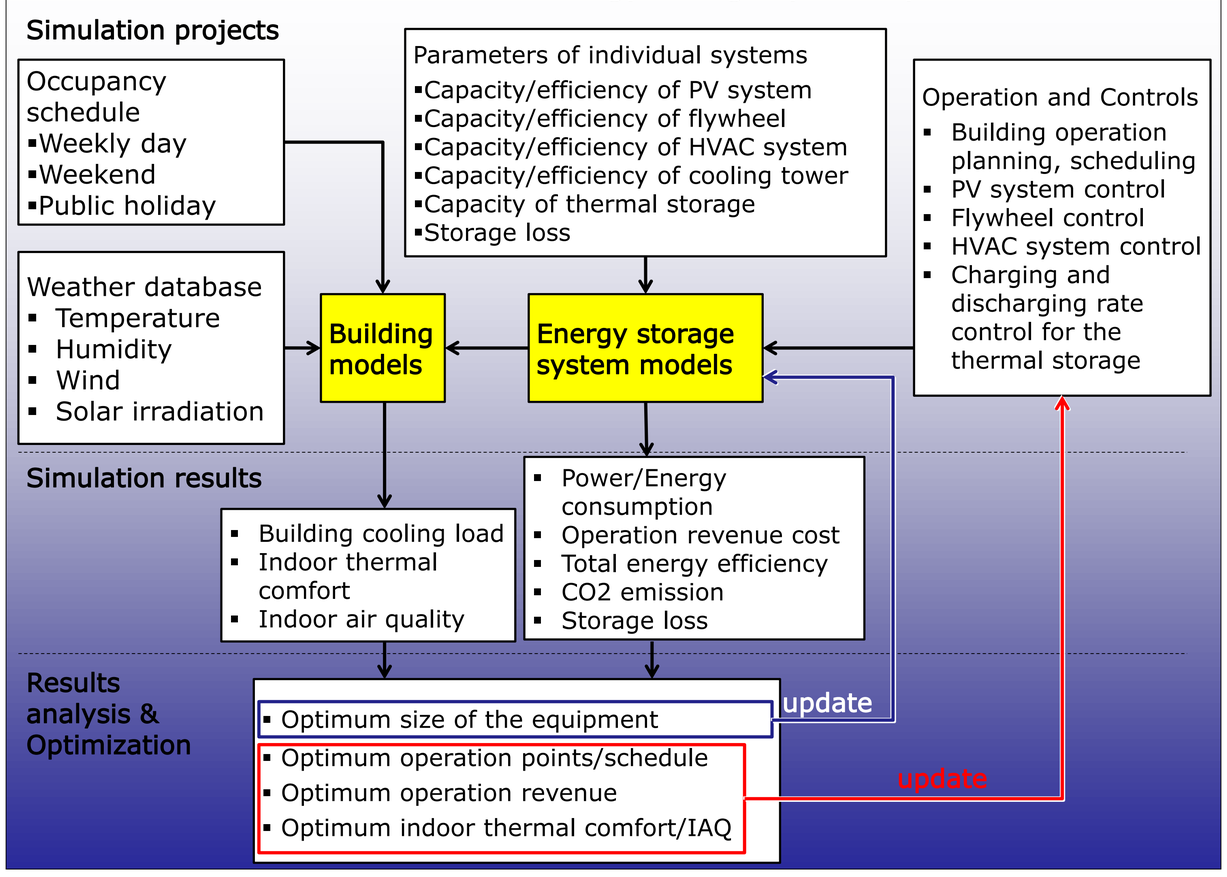
Problems

Interactive energy flows, conversion processes and end-use in buildings



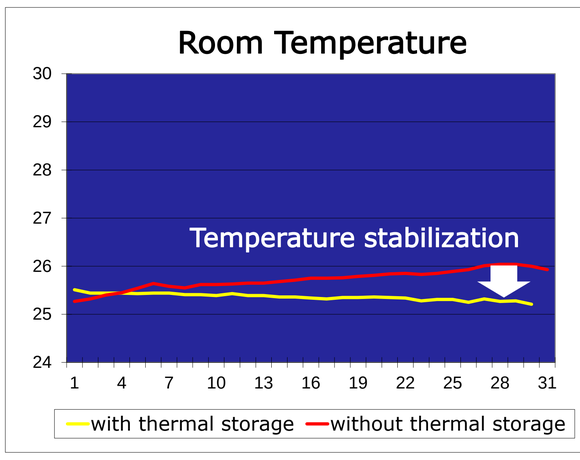
Methodology

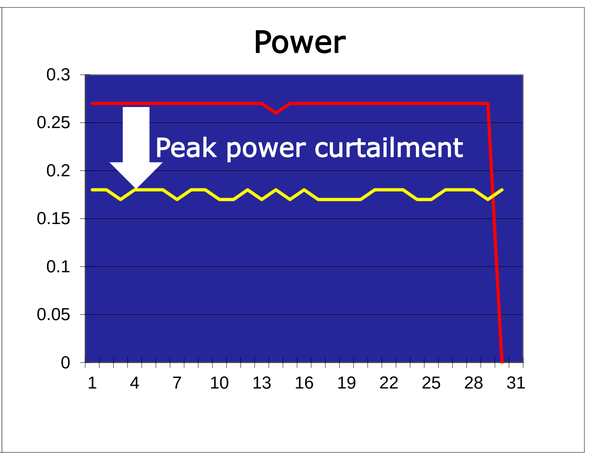
Simulation based energy storage system operation



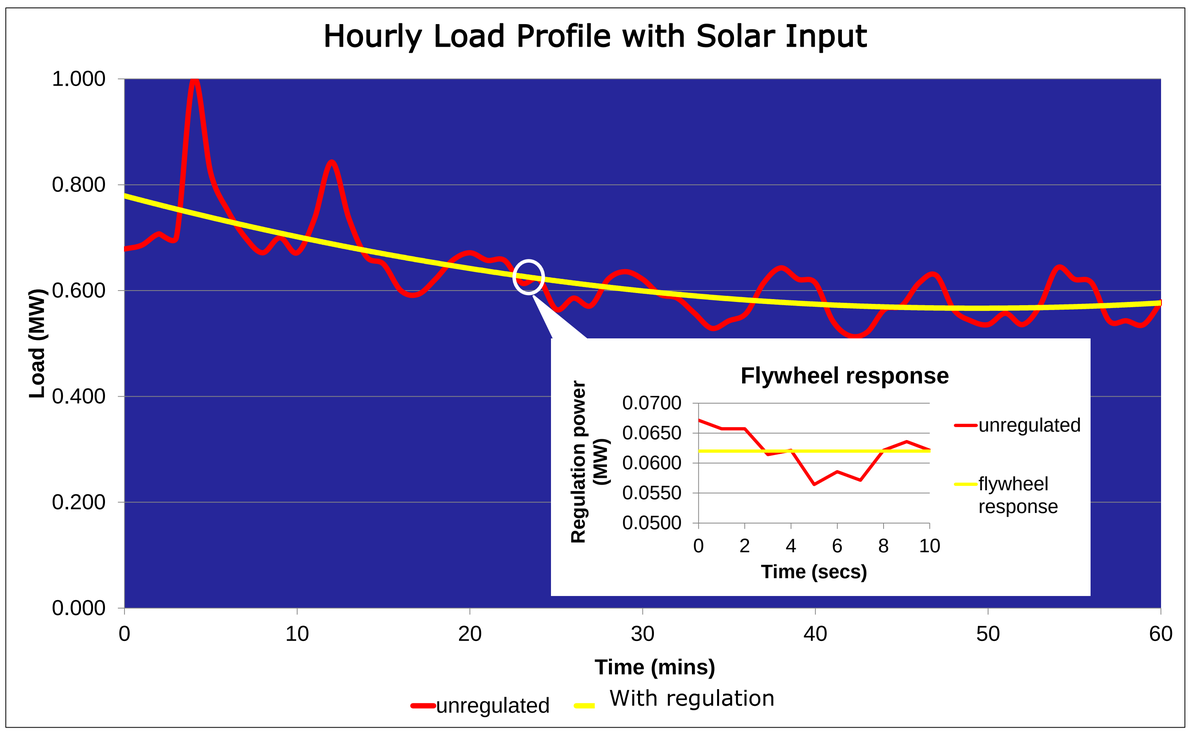
Expect results (concept drawings)

Thermal storage operation during the peak thermal load period

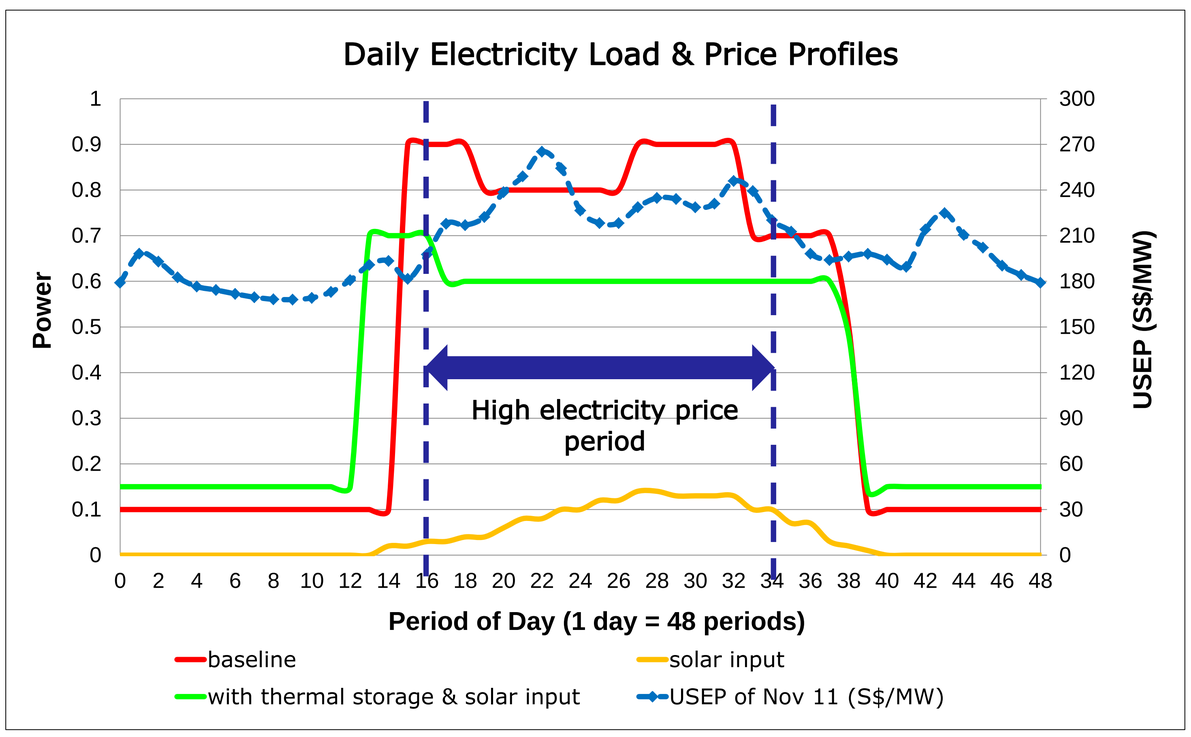




Flywheel regulation for load smooth



Cooperative operation of thermal storage and PV-flywheel system



Schedule

Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep

- Building, storage system modeling
- System simulation
- Scenario simulation, control algorithm development
- prototype
- Experiment setup
- report
- Control method validation and verification