



energy technology
& fluid dynamics

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Energy Technology & Fluid Dynamics

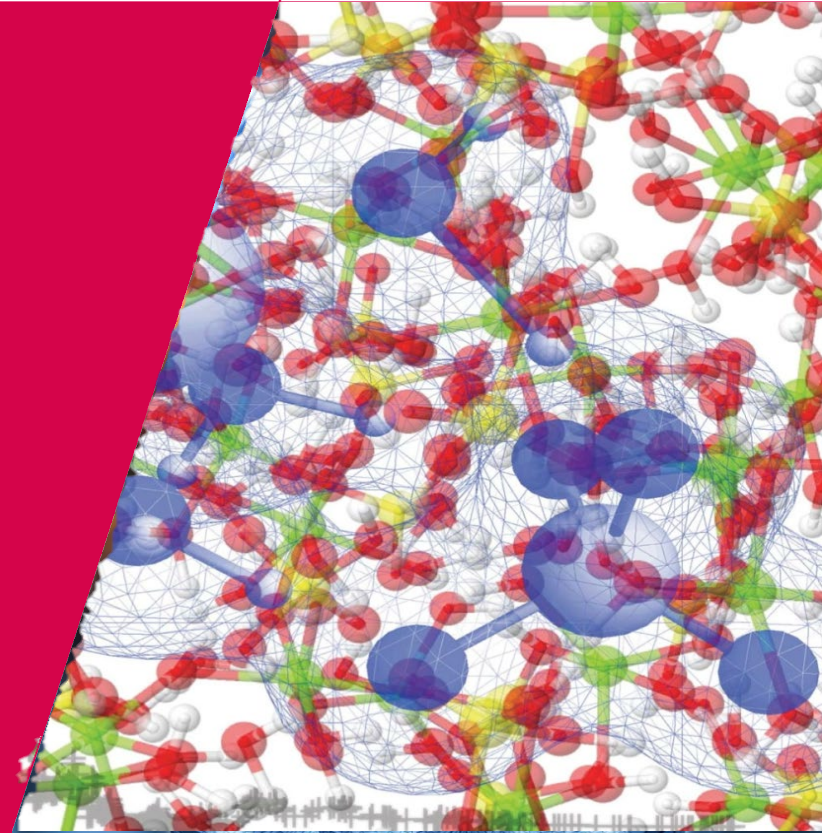
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Eindhoven
University of Technology

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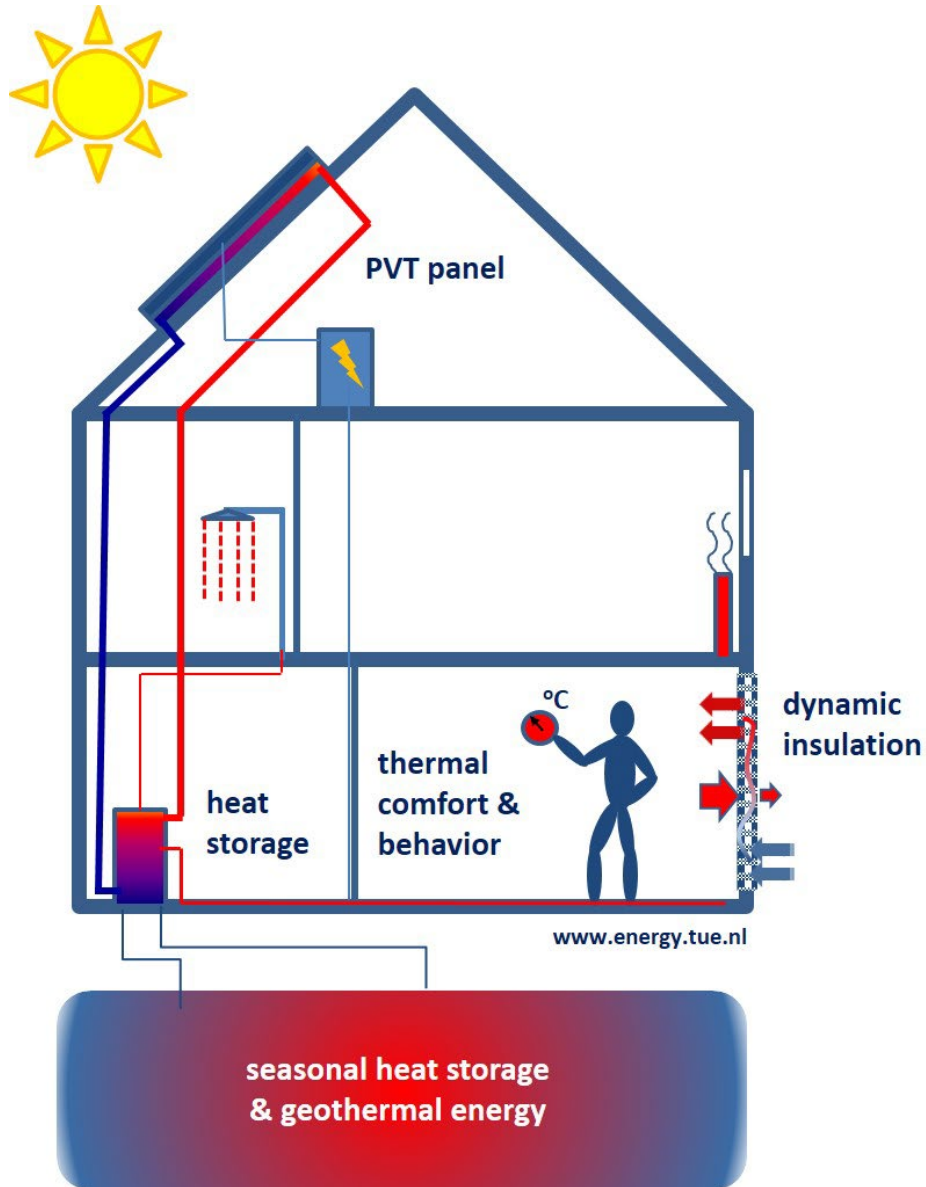
Mission

- Decarbonize our energy system e.g. heat storage, hydrogen storage and transport
- Build high-tech systems to carry energy and information
- Explain that it works (society, students)

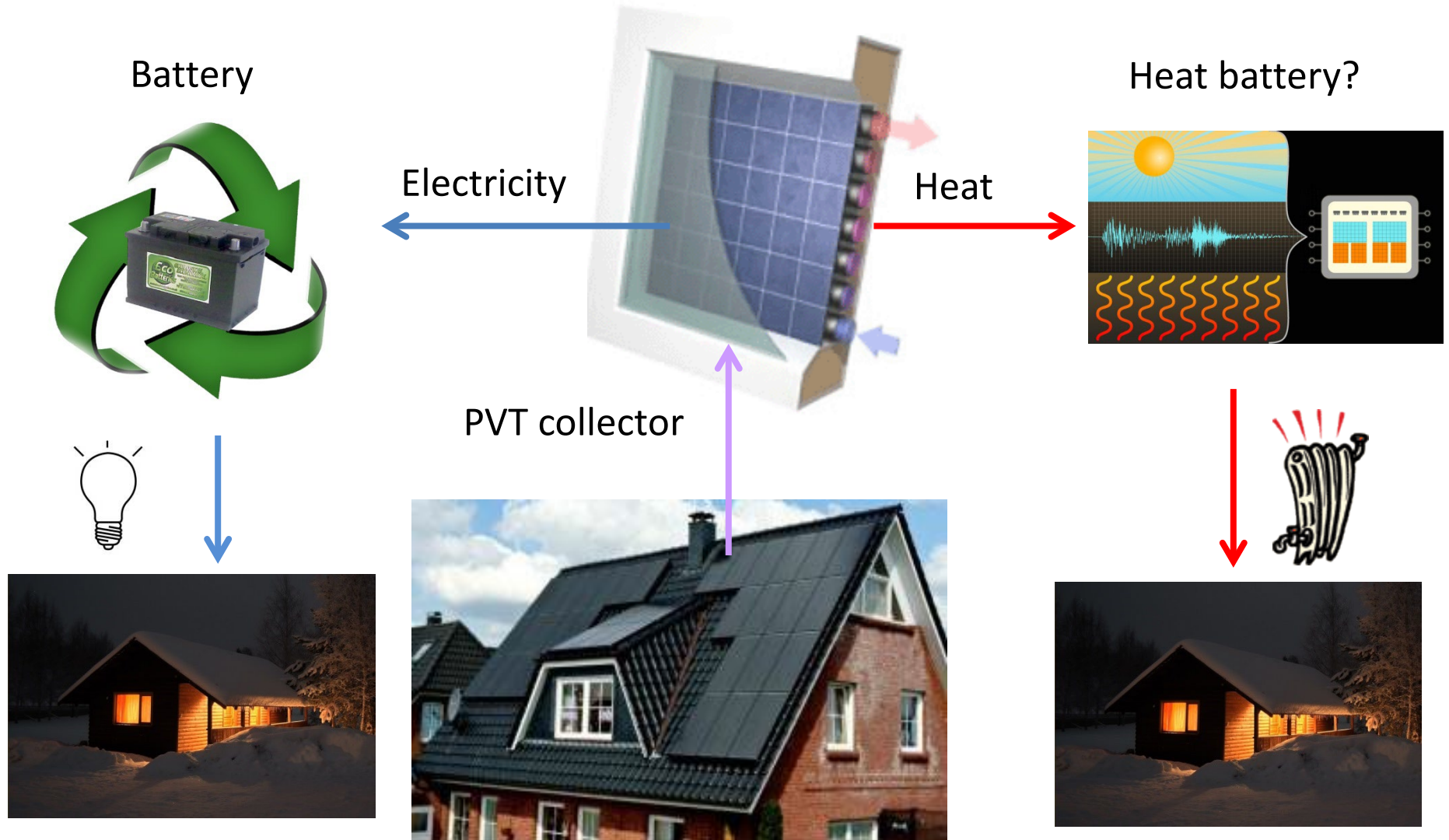
How?

- Generic applications (e.g. porous materials)
- Collaborate with organizations, industry and government
- Experiments
- Numerical tools

Research topics ETFD

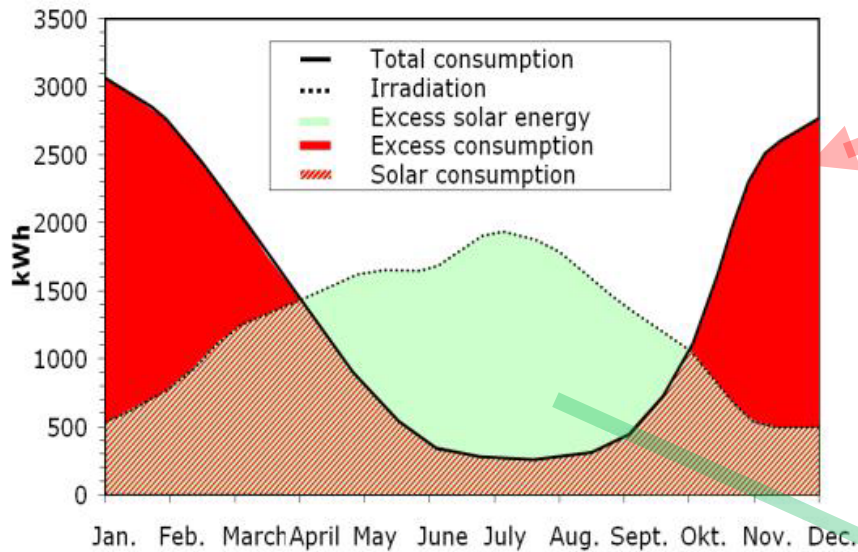


Example: compact heat storage: “The quest for the heat battery”

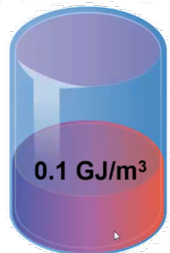


Example: compact heat storage: “The quest for the heat battery”

Seasonal mismatch in energy production/consumption



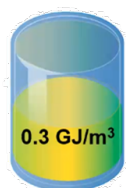
Sensible heat



Commercial

(E.g. in liquids, solids)

Latent heat



Commercial

(E.g. PCM)

Thermochemical

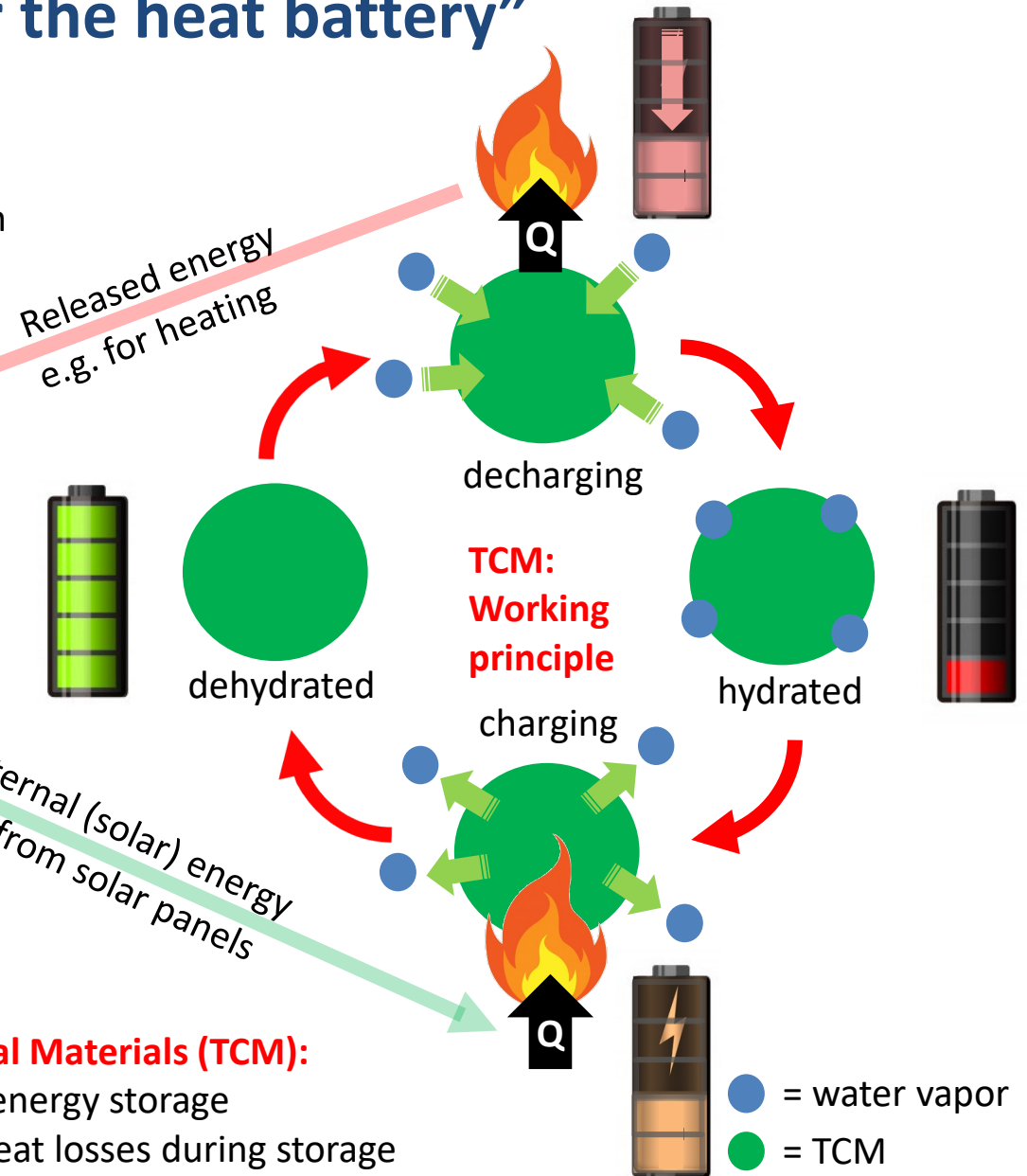


Under development

(chemical reaction)

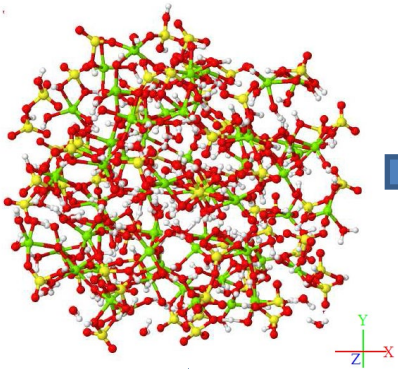
Thermo Chemical Materials (TCM):

- High density energy storage
- No thermal heat losses during storage

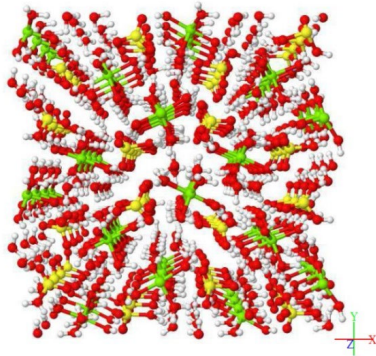


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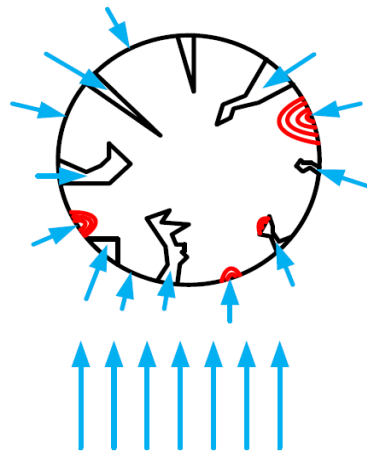
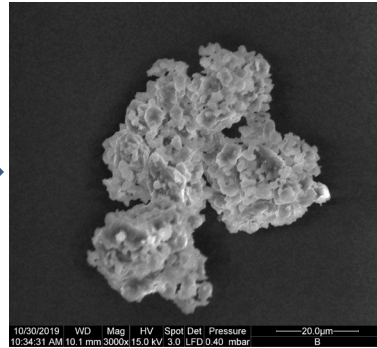
Molecular scale



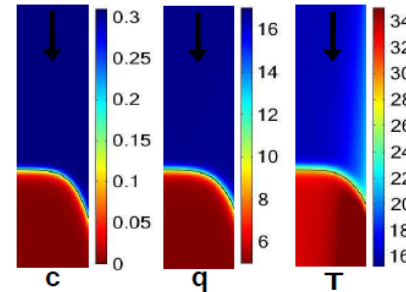
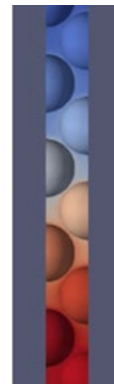
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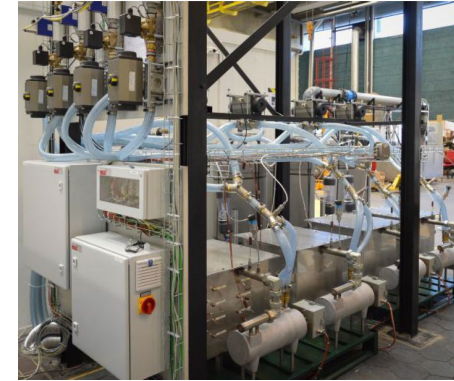
Grain scale



Reactor scale



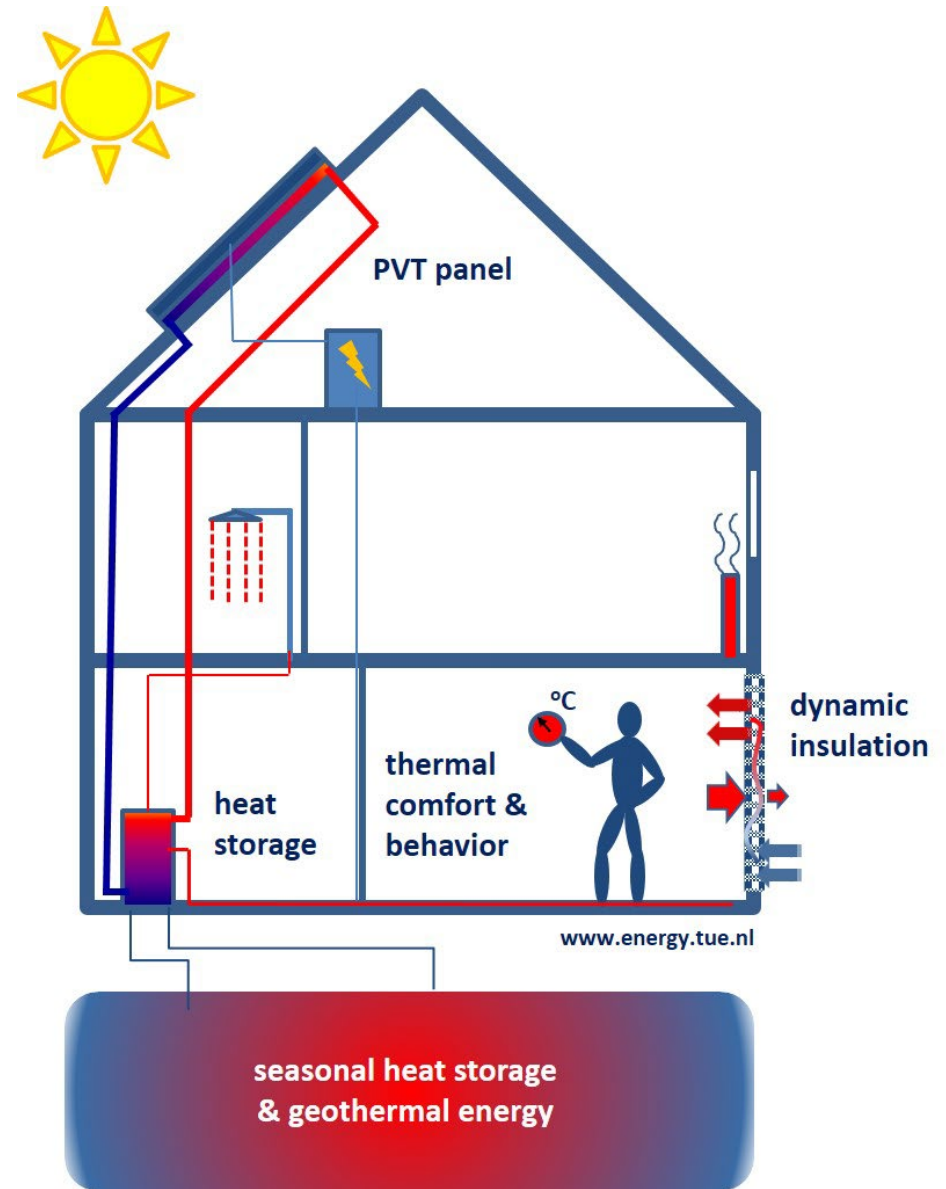
Building/district scale



Multi-scale approach

Research topics:

- Potovoltaic & Thermal (PVT) solar panels
- Heat exchangers and boilers
- Seasonal heat storage
- Geothermal energy
- District heating
- Dynamic insulation
- Dynamic thermal comfort
- CO₂ separation & storage
- H₂ transport & storage
- LNG processing
-
- Experiment, theory, numerics





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