

# Thermal energy storage: unlocking the potential of RHC

Prof. Dr. Luisa F. Cabeza

Focus group Thermal Storage leader



# Importance of thermal energy storage (TES)

- The ability to store thermal energy is very important for using renewable energy in heating and cooling effectively

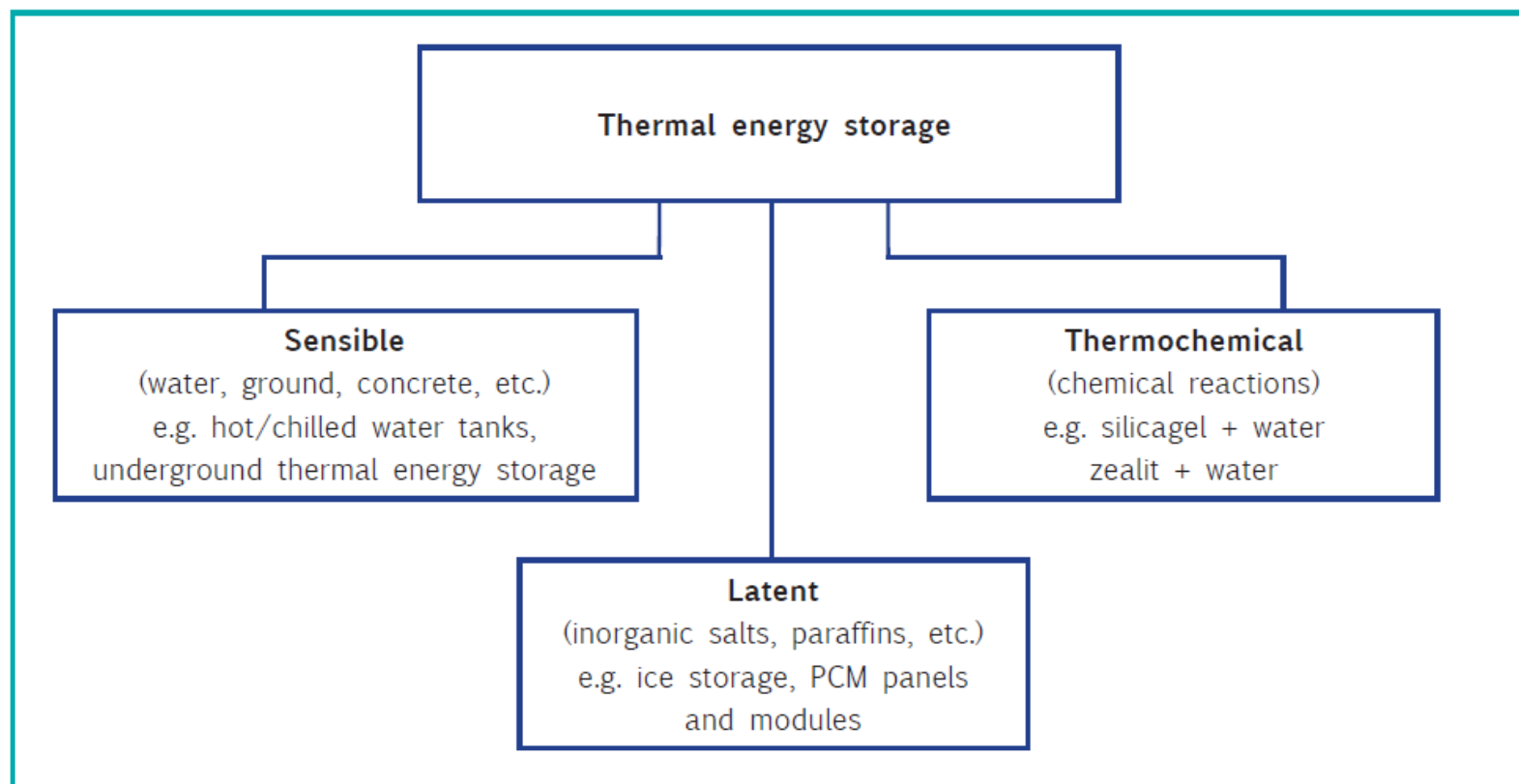
# Reasons for using TES

- Improving system efficiency by avoiding:
  - Partial load operation
  - Operation at other sub-optimal times
  - Taking advantage of waste energy
- Shifting demand over time to reduce peak loads
  - Improvement of overall energy system efficiency
  - Reduction investment in energy infrastructure
  - Reduction of costs
- Facilitating the greater use of renewable energy

# Key parameters for TES

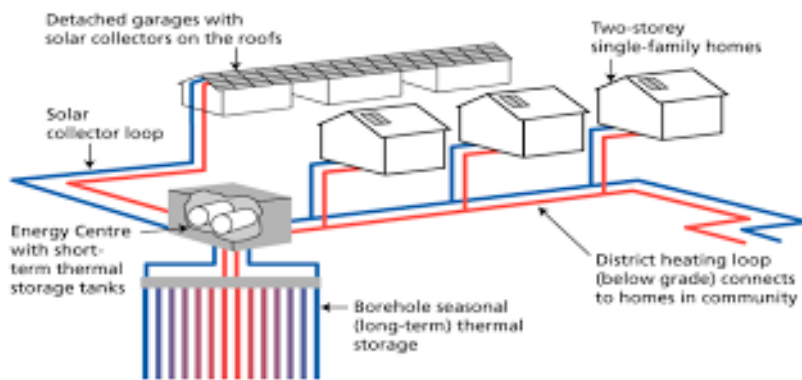
- Capacity
- Energy density
- Power rating (ability to discharge)
- Efficiency (losses over time and with charge/discharge)
- Cost

# Technologies



# Examples

- UTES in solar homes



# Examples

- Water storage for DHW



# Examples

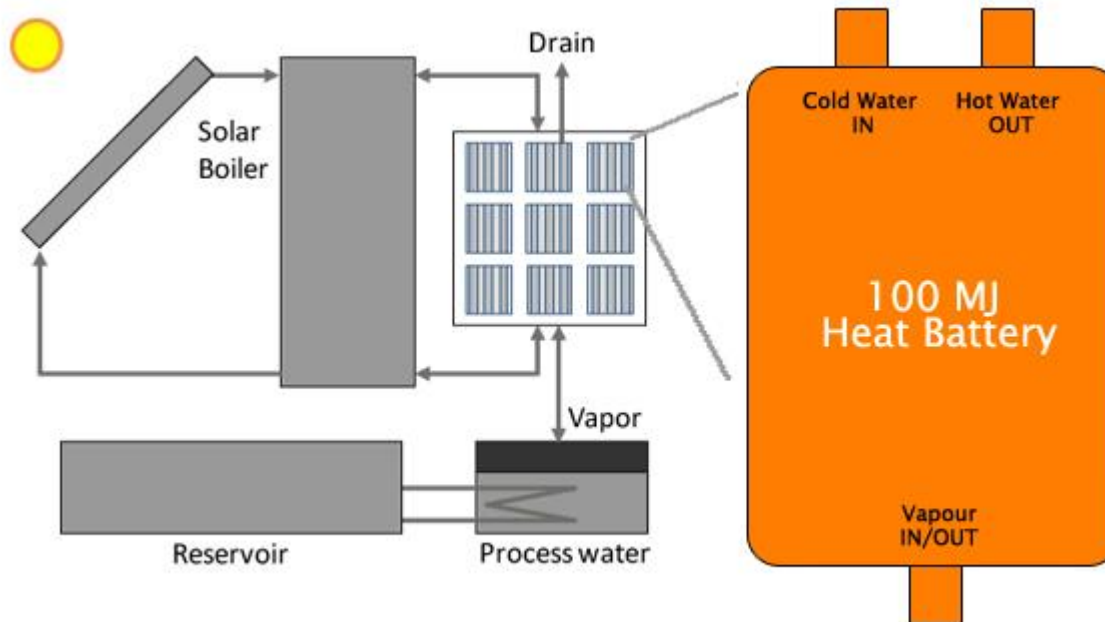
- PCM in solar cooling systems





# Examples

- TCM for renewable heating and cooling



# Conclusions

- The emphasis of scientific research, development and demonstration activities must be focussed towards storage technologies that enhance the performance of energy systems and facilitate the integration of RES
- The future of TES applications depends on the achievement of:
  - Reducing costs
  - Improving the ability to shift energy demand over time