SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY

Task67/Task40
Compact thermal energy storage materials within components within systems

Wim van Helden, AEE INTEC, Austria
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Joint Task

Task67/Task40 is a joint Task between the IEA programmes

Solar Heating and Cooling (SHC)
and
Energy Storage (ES)

More than 60 experts from 14 countries worldwide collaborate in the T67T40

Start: June 2021; End: June 2024

Scope

- CTES (Compact Thermal Energy Storage) materials
  - Phase Change Materials (PCM)
  - Thermochemical Materials (TCM)

- CTES material…
  …characterization
  …development
  …improvement
  …testing in components (heat exchangers, reactors)

PCM
(e.g. ice, paraffins, salt hydrates)

TCM
(e.g. zeolite+water, NaOH+water)

Goals

- to have a better understanding of the factors that influence the storage density and the performance degradation of CTES materials
- to be able to characterize these materials in a reliable and reproducible manner
- to have methods to effectively determine the state of charge of a CTES
- to have better knowledge on how to design optimized heat exchangers and reactors or CTES technologies

Approach

- Determine application boundary conditions (ABC) (temperatures, powers, cycles, contact with other materials, mechanical conditions, …)
- Use these to improve storage materials
- Test materials performance on small scale; are tests suited?
- Use ABC for component development
- Determine material – component interaction; can we improve the design process?

Task structure

	Subtasks	Subtask Lead
A	Material Characterisation and Database	Daniel Lager, AIT, Austria
B	CTES Material Improvement	Stefania Doppiu, CIC energiGUNE, Spain
C	State of Charge – SoC Determination	Gerald Englmair, DTU, Denmark (for PCM) Reda Djebbar, NRCan, Canada (for TCM)
D	Stability of PCM and TCM	Christoph Rathgeber, ZAE Bayern, Germany
E	Effective Component Performance With Innovative Materials	Benjamin Fumey, Empa, Switzerland (for TCM); Ana Lazaro, Univ. of Zaragoza, Spain and Andreas König-Haagen, Univ. Basque Country, Spain (for PCM)

Webinar

Three topics further deepened in this webinar:

- How can we test material properties reliably and replicably?
- How can we determine the State of Charge (SoC) of a compact thermal storage?
- Which factors determine the stability of the storage material?

Enjoy the Webinar!

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