



# 2025 Highlights

## Task 74 Components for Thermal Energy Storage

### THE ISSUE

Many thermal energy storage technologies are already on the market and have a good performance and low costs. Especially in applications that require higher temperature, smaller volumes or added functionality of thermal storage technologies, there are still several challenges to be tackled, specifically in the design of components. These are: limited energy transfer to and out of the system, large part due to the low thermal conductivity of available thermal storage materials and slow reaction rate; abrasion risk; or mixing/two-phase flow difficulties.

### OUR WORK

Thermal energy storage technologies will be included that generate or have generated challenges in the design of their main components, in applications from a broad temperature range and with small and (very) large storage capacity. The main components are either the heat exchanger between the active, sensible or latent, storage material or the reactor for both heat and mass exchange with thermochemical materials. Typical application examples include a latent heat storage device to store waste heat from a data centre, a sorption reactor for seasonal solar storage, a fluidized bed reactor for a thermochemical storage at 250 °C for industrial heat storage or a heat exchanger for a high-temperature sensible storage for a power-to-heat process at 500 °C. The storage capacities can range from less than 100 kWh to more than 1 MWh.

Our objective is to bridge the gap between storage materials and practical implementation, and we work on three key pillars, which are also subtasks:

- Application-oriented Case Studies
- Component Design and Integration
- Determination of the State-of-Charge

#### Participating Countries:

*Austria*  
*Canada*  
*China*  
*Denmark*  
*France*  
*Germany*  
*Italy*  
*Netherlands*  
*Norway*  
*Poland*  
*Slovenia*  
*Spain*  
*Sweden*  
*Switzerland*

### KEY RESULTS

The Task74 kicked off in October 2025 in Stockholm, Sweden, where we worked on a list of thermal energy storage component suppliers as a basis for future industry workshops. A longlist was made of thermal energy storage applications from which a small number of exemplary applications will be chosen.

Regarding design of components, the idea of organising a round robin test with a very simplified PCM storage was discussed.

And for the state-of-charge work the new developments that will be added to the inventory of state-of-charge techniques and principles that was published in the previous Task67 were discussed.

<b>Task Period</b>	<b>July 2025 – June 2028</b>
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