



Thermal Energy Storage Research Outlook

Luisa F. Cabeza¹, Antonio Marco Pantaleo², Simone Mancin³

¹ GREiA Research Group, Universitat de Lleida, Lleida, Spain
luisaf.cabeza@udl.cat

² Università degli studi di Bari Aldo Moro, Bari, Italy
antonio.pantaleo@uniba.it

³ University of Padova, Department of Industrial Engineering, Padova, 35131, Italy
simone.mancin@unipd.it

Abstract

The European Union's ambitious targets for achieving climate neutrality demand groundbreaking approaches and pioneering products across numerous technological sectors. The necessity of shifting toward a more economically viable energy framework underscores the significance of emerging cost-effective energy storage technologies, encompassing thermal energy storage (TES) for capturing waste heat, providing heating and cooling services, or enhancing power system adaptability through power-to-heat-to-power conversion.

This work concentrates on technically emerging TES technologies, which have been proposed in the open literature, highlighting the possible future research paths. Sensible, latent, and thermochemical TESs are considered to highlight recent innovations and proposing an overview of the most attracting topics for the community, encouraging the development of ground-breaking idea encompassing circular economy.

Keywords: Sensible; Latent; Thermochemical; Thermal Energy Storage; research; future