Cod. ATECO C23, C25, C28, D35

MEDIUM-HIGH TEMPERATURE THERMAL ENERGY STORAGE SYSTEMS

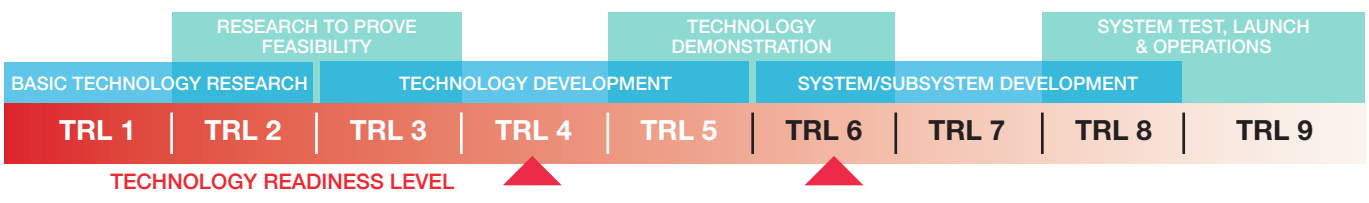
Innovations and Benefits - This technology improves energy dispatchability, increases the number of operation hours of facilities, decreases fossil fuel energy consumption, and reduces the consequent environmental impact. The sensible heat thermal energy storage can occur either in liquid or solid media: the use of molten salt and cement allows to obtain low-cost systems. The latent heat thermal energy storage has the advantage to have a high stored energy density and, consequently, to allow the realization of compact storage systems with low visual impact. In addition, taking advantage of the phase change of the storage material, it provides heat at a substantially constant temperature, increasing the overall efficiency of the system.

Uses - Development of sensible heat and/or latent heat thermal energy storage systems for medium/high temperature to be used both in large solar systems for the production of electric energy and in small plants dedicated to distributed multi-generation, production of process heat for industry, heating/cooling for buildings and districts and desalination. Possible outcomes of these concepts could be the recovery of industrial heat or the increasing in energy efficiency in public and private buildings.

Past and Present Activities - Different types of thermal energy storage based on the use of cement (sensible heat) and molten salt (latent heat) have been studied and designed. The complete thermal characterization of these prototypes is in progress using experimental plants specially developed (Solteca3, ATES). The activity is conducted in collaboration with several companies interested in the development of these systems.

ATES facility (PCM)

Concrete thermal energy storage modules



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