

Abstract

This thesis deals with thermal energy storage systems (TES), which are devices used to store and re-lease thermal energy with a time delay. In the first part of the thesis, the state-of-art of the TES systems is discussed, grouping the different technologies on the basis of the energy storing process. In the second part, a storage system represented by a water tank buried into the ground is analyzed; the tank is supposed to store the heat coming from a solar collector. The heat stored through a heat pump is used to supply the heating load to a small house. The simulation is made in three different locations: Stockholm, Venice, and Barcelona; for each of them an exergy comparison is presented among different systems to supply the heating load.