Life Cycle Analysis of a Combined Sensible and Latent Heat Thermal Energy Storage System

Roberto PETRUCCI – *University of Perugia*

Sensible and latent heat thermal energy storage systems are promising components in the decrease of the difference between energy supply and demand. Thanks to the use of phase changing materials, heat waste from upstream processes can be stored and made available for downstream ones. This potentially leads to environmental benefits (avoided releases of harmful substances into the atmosphere) and fossil resources preservation. On this regards, the environmental benefits regarding production and use stages of the latent and sensible heat energy storage systems have been studied by means of Life Cycle Analysis. The most important flows crossing the energy storage systems, the most important impacts and damages have been investigated. Moreover, their potential time of use, over which the whole environmental impact and the widest group of impact categories and damages are abated, have been calculated (environmental Pay-back time).