Overview and benifit of Energy Storage for Solar Thermal Power Plant

Abstract— The use of energy storage is increased operational flexibility of solar thermal power plant in the limited solar hour. The paper explores the energy storage option for the integration with large-scale solar thermal power generation system. An analysis is done for five large-scale thermal energy storage technologies that are two-tank, thermocline, concrete, castable ceramic and phase change material (PCM). Cost–benefit analysis shows that the savings operation cost from energy storage increase with the size of the storage. Taking into account the large investment costs, energy storage units are however unlikely to have a profitable exploitation. A study is done by fixing thermal storage output capacity for operating 50MW power plant for six hours. The use of energy storage decrease the system's overall CO_2 emission levels, it is act as a replacement of natural gas boiler backup system for solar thermal power plant.