CST/CSP hybridization with other renewable energies

Walter GAGGIOLI - *ENEA*

CSP systems through thermal energy storage can contribute significantly to transforming the European energy system, guaranteeing it an essential share of dispatchable renewable electricity. By providing flexibility for grid services, CSP can help integrate variable renewables, such as photovoltaic (PV) or wind power, into the energy system. This helps make the transmission network more reliable.

The storage systems adopted in CSP plants can be used as versatile energy hubs, capable of storing renewable energy generated from various sources and of using it to power both thermal and electrical utilities or energy networks on-demand.

The hybridization of the CSP with other renewable technologies (for example wind or PV) has to date always been implemented at the system level, the integration at the component level allows to increase the share of renewable energy available to feed energy networks. The same technology makes it possible to extend the use of CSP technology also to areas with a DNI of less than 1900 kWh/m2/year, as well as allowing the use of renewable energy also in markets that are currently closed to it (e.g., the day-ahead market).

A thermocline type thermal storage system used for the CSP can also be easily powered by other energy sources by inserting different special heat exchangers/electrical heaters inside the tank, thus allowing the storage medium to be heated both with different energy sources and at different times.

During the conference will be shown a lay out of a thermocline storage system designed to permit the hybridization of the CSP with PV or Wind and its possible application as system to support to power grid.