

## **ABSTRACT:**

Concentrating Solar Power (CSP) is growing more rapidly than other renewable energies, since its first commercial applications for power generation in California. To ensure a rapid development of this clean power, Algeria has set up a national program for the promotion of renewable energy sources in the frame of a sustainable development up to 2020. In this program CSP is expected to supply about 40% of the total renewable electricity by 2050. In the present article, we first provide an overview about current status of CSP market around the World as well as we highlight the Algerian renewable energies program. After that, we report the simulation results of the performance of the most promising CSP power plants, i.e., Integrated Solar Combined Cycle System (ISCCS) and the Hybrid Solar Gas Turbine (HSGT). Furthermore, we introduce new concepts that would bring CSP power plants to the forefront since they are more efficient and friendly environmental. The HSGT with LNG Cooling and other advanced concept with Carbon Capture & Storage (CCS) are good examples. The simulations have been based on a computer code developed by the Authors. The selected sites for the simulation are Hassi R'Mel and In Salah