COMPASsCO$_2$

LC SPIRE 08 2020

Aim:
To integrate solar energy into supercritical CO2 Brayton power cycles. Concentrated solar radiation will be absorbed and stored in solid particles and the heat transferred to the sCO2. The participants will produce, test, model and validate novel particle and alloy combinations that meet the extreme operating conditions. A particle-sCO2 heat exchanger will be validated in a relevant environment.

Concept:
In the envisaged solar-Brayton cycle, supercritical carbon dioxide (sCO2) is used as working media. Unique properties of sCO2 (such as high density and low viscosity) allow reaching high efficiency of the energy conversion and very compact design of the components compared to conventional Rankine steam cycle. COMPASsCO2 will focus on the connection between solar energy and sCO2 Brayton cycles, enabling more efficient CO2-free electricity production. Novel concentrating solar power systems that use solid particles as the heat carrying and storing media are considered. The project will research and develop particles for the solar cycle and alloys for the heat exchanger which can withstand the operating conditions regarding temperature, pressure, abrasion, oxidation and corrosion during the plant lifetime.

Start date:
01/11/2020

End date:
31/10/2024