

Innovative concentrated solar power plant configuration under test in southern Spain

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A consortium of solar thermal electricity experts, coordinated by CENER, has started to test the key components of an innovative concentrated solar power plant configuration that promises to considerably increase the efficiency and reduce the levelised cost of electricity of CSP technologies.

The development of this new plant concept is one of the main outcomes expected from the Competitive Solar Power Towers (CAPTURE) project, which has received funding from the EU's Horizon 2020 Framework Programme. The innovative plant configuration is based on a multi-tower decoupled advanced solar combined cycle (DSCC) approach that not only increases cycle efficiencies but also avoids frequent transients and inefficient partial loads, thus maximising overall efficiency, reliability as well as dispatchability.

“We are glad that the European Commission is making it possible to demonstrate this new CSP plant configuration”, says Dr. Fritz Zaversky (CENER), coordinator of the project. “We hope that our results will increase the overall efficiency of a CSP plant and, at the same time, the competitiveness of this technology in the power market.”

CAPTURE is developing all key components for the proposed plant configuration, including an unpressurized air solar receiver unit, a network of highly efficient fixed-bed regenerative heat exchangers, a two-stage, intercooled Brayton gas turbine cycle, validation-scale prototypes, small-area downsized heliostats as well as the complete theoretical assessment and optimisation of the modular multi-tower DSCC.

The project started in May 2015 and will last 4 years until April 2019. The solar receiver prototypes tests started in November 2016. The chosen test facility is the “Plataforma Solar de Almería”, a well-known solar test area in southern Spain, where all required infrastructure for the validation of the concept, such as an experimental tower and heliostat field are already available.

