

Towards future solar thermal power plants - R&D activities at DLR

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Abstract

With 6.000 employees DLR is one of Europe's leading public research institutions, setting trends in its aeronautics, space, transport and energy business areas. DLR is working on the investigation and improvement of solar thermal power plants since more than 20 years. It covers all R&D aspects from basic research via more application-oriented research to consulting. Currently the Institute is distributed over three sites (Stuttgart, Cologne and Almería/Spain) with its own test facilities in Cologne and direct access to the largest European CSP test centre at the Plataforma Solar de Almería in Spain (PSA).

DLR's basic research activities are focussing among others on solar material conversion with an emphasis on solar fuels and the development of innovative high temperature solar power plant systems such as the solar-hybrid gas turbine process. The application oriented research at DLR focuses on cost reduction of solar thermal power plants. Two potential candidates for future cost reduction is the direct steam generation in parabolic troughs or linear Fresnel collectors and solar tower systems using open volumetric receivers. Furthermore, DLR has developed several measurement techniques for the qualification of major CSP components such as Heliostats, parabolic trough and linear Fresnel collector optics and several receiver systems. Based on the experiences gathered in the past two decades DLR is offering consulting activities such as pre-feasibility studies, due-diligence studies or system and component qualification during construction and commissioning.

The presentation will describe the state of the art in solar thermal power plant technology and point out possibilities for future cost reduction. Finally, it is presented how DLR addresses the according R&D tasks.