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Fraunhofer ISE Supports Market Development of Solar Thermal Power Plants in the MENA Region

The costs of solar thermal power plants are falling, as with the other renewable technologies of photovoltaics and wind. As a result, new power plants are very promising especially in the MENA (Middle East and North Africa) region. Within the framework of the World Bank Middle East & North Africa Concentrating Solar Power Knowledge & Innovation Program (MENA CSP KIP), the Fraunhofer Institute of Solar Energy Systems ISE is laying the groundwork for the market development of concentrating solar thermal power (CSP) with techno-economic analyses and know-how.

»Current projects in the region show that CSP can play out its strengths of flexibility and storage options in countries with a high percentage of direct radiation,« explains Thomas Fluri, group leader for solar thermal power plants at Fraunhofer ISE.

Researchers of Fraunhofer ISE present the most recent results of the MENA CSP KIP program at the upcoming »CSP Markets, System Value & Financing Conference«, to be held from 26th to 28th February in Dubai. At the event, the current developments in CSP are to be presented by important stakeholders and industry representatives from many different countries.

Within the World Bank program MENA CSP KIP, the Fraunhofer researchers are investigating four different aspects:

Analysis of Local Conditions for CSP Power Plants

Aspects under analyzation are the solar irradiation resources, power plant investment, plant operation and feasibility at different sites. For these investigations, Fraunhofer ISE uses comprehensive CSP modeling tools (CoSimCSP) for analyzing the power plant and its operation. Up to now the institute has carried out local analyses for sites in Maan, Jordan and in Akarit, Tunisia.

Integration of CSP Power Plants in the Electricity System

In determining the feasibility and economic viability of CSP systems, an important consideration is its integration into the electricity market. Questions about the role of CSP systems in the specific electricity system, the optimal operating strategy or suitable

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locations for power plants on grid nodes, for example, will be answered using ENTIGRIS (www.entigris.org). A detailed plan for grid expansion and strategy will be set up. Project manager Christoph Kost of Fraunhofer ISE sees the use of CSP in MENA countries as advantageous. He explains: »Fraunhofer ISE has analyzed the electricity systems in Jordan and Tunisia. In both countries, it was shown that CSP power plants add diversity to the renewable power plant park and present an economically optimal solution through cost reductions.«

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Solar Process Heat for a Local, Low-cost Steam and Process Heat Supply

Solar thermal systems can be used to meet the local demand of industries that need high temperature heat and process heat. Fraunhofer ISE analyzes potential industries and applications with respect to demand, application potential and economic efficiency. Already the Fraunhofer researchers were in areas of Palestine and Tunisia in order to test the potential and possible applications of the solar thermal systems on site.

Increasing Know-How and Innovation of Local Stakeholders

For successful market integration, a comprehensive analysis of the technical and economic conditions of CSP power plants is key. Increasing know-how, creating innovations and local stakeholder participation are important steps toward profitable and sustainable CSP projects and efficient system integration. It is also essential to efficiently integrate local industry and person power into CSP expansion. Fraunhofer ISE is investigating these factors and supporting local stakeholders in their implementation.

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The Nour CSP power plant in Ouarzazate, Morocco. The parabolic trough plant is coupled with thermal storage in order to meet the peak loads occurring in the evening in Morocco. ©Fraunhofer ISE

MENA CSP KIP Website: <http://cmimarseille.org/menacspkip/program/>

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