German Aerospace Center

DLR to analyse solar potential for Pakistan as part of global World Bank initiative

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The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) has been commissioned by the World Bank to investigate Pakistan's potential for the exploitation of solar energy. DLR researchers will be using satellite data and ground measurements to generate a radiation map showing the best regions for solar power generation in Pakistan.

The scientists will provide the government authorities in Pakistan with the solar radiation map in 2017, intermediate outputs will be available prior to then. This will be a crucial decision-making tool for identifying productive and favourable locations for solar power plants. On the basis of its years of experience and internationally recognised expertise in the area of solar resource research, the Systems Analysis and Technology Assessment Department of the DLR Institute of Technical Thermodynamics has been asked to work with the German Remote Sensing Data Center and the DLR Institute of Atmospheric Physics to analyse the solar potential of Pakistan. Chairman Johann-Dietrich Wörner is pleased that DLR can offer its expertise to the World Bank as part of a global initiative on Renewable Energy Resource Mapping being funded by the Energy Sector Management Assistance Program (ESMAP). ESMAP is a multi-donor trust fund administered by the World Bank and supported by twelve donor countries, including Germany. "In this project, DLR can offer its outstanding combination of expertise in remote sensing, atmospheric physics and energy systems analysis", he said.

Use of satellite data and ground measurements to search for sites

To carry out the assessment, an international project consortium consisting of DLR, CSP Services, ECOFYS and local partner PITCO will start by assessing satellite image data from the past 15 years. At nine locations spread over the whole of Pakistan, ground stations will be set up to measure local solar radiation for two years. During an inauguration ceremony on October 18th 2014, the first solar measurement station under this project was installed at QA Solar Park near Bahawalpur, Punjab Province. At this site a 100MW PV Solar Power Plan is under construction as part of a plan to install over 1GW of solar PV capacity.

The measured data from this and the other sites will be compared with the satellite models to create a reliable Solar Atlas of Pakistan. "The project and its results will help raise awareness about the availability of renewable energy resources in Pakistan. The validated solar atlas will enable government authorities as the Alternative Energy Development Board (AEDB), which is the Pakistan counterpart in this project, and local institutions and businesses to identify suitable areas for developing renewable technologies", explains Christoph Schillings, project leader at the DLR Institute of Technical Thermodynamics.

Knowledge transfer to Pakistan

With the radiation data collected, DLR scientists will be able to provide a realistic and reliable source of information from which a tariff structure for solar energy in Pakistan can be derived. Another important part of the project is the development of local expertise. In the context of 'capacity building' measures, the partners will be trained locally to, for example, capture and interpret data to assess the solar potential. By participating in the programme, Pakistan is aiming to develop renewable energy sources and ensure greater security of supply in its growing electricity market.

At present, twelve countries including Zambia, Tanzania and the Maldives, have applied to participate in ESMAP's Renewable Energy Resource Mapping Initiative. In addition to solar radiation, the potential for wind, biomass and hydropower will be analysed under the initiative.

More information on Renewable Energy Resource Mapping in Pakistan

More information on ESMAP

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Study: potential for the exploitation of solar energy

A DLR scientist uses a rotating shadowband irradiometer to measure the direct solar radiation.
