PermaStrom research project: KIT, DWD and meteocontrol investigate the impact of atmospheric aerosol particles on solar power production

**More precise PV yield forecasts through taking account of aerosols**

**Augsburg, July 16, 2020 – meteocontrol GmbH, a solar energy service provider based in Augsburg, is a team partner in the new PermaStrom research project. Together with the Karlsruhe Institute of Technology (KIT) and the German Meteorological Service (DWD), meteocontrol is investigating how atmospheric aerosol particles affect clouds and solar irradiation. The findings are intended to help create more precise yield forecasts for photovoltaic systems in order to make power grids more stable.**

Weather forecasts that are as accurate as possible are crucial for the management of power grids. This is because yield forecasts for photovoltaic systems are based on sunlight predictions. If the actual irradiation is less than the forecast values, the grid operator is forced to either pay high energy compensation costs or to down-regulate certain systems as part of their feed-in management system. Aerosol particle concentrations, such as those caused by large-scale forest fires or Saharan dust, have been insufficiently considered or totally neglected in numerical weather forecasts until now, yet they can lead to significant incorrect predictions of solar irradiation on individual days.

As part of the ‘Photovoltaic yield forecast for the better management of the impact of atmospheric aerosols on power grids in Germany and Europe’ project (PermaStrom), the research partners wish to better account for these effects in the weather forecast and the PV yield forecasts based on them. The challenge lies in modelling and, in particular, predicting the effects of aerosols such as ash, dust and sand grains on cloud formation. This is because the processes in clouds and their interaction with aerosol particles are still not fully understood. The project team uses both measured data from weather stations and satellite data for the study. These data are processed in an expanded numerical weather prediction system that the DWD operates specifically for this purpose. While the DWD is primarily dealing with the operationalisation of the ICON-ART weather model, the KIT team led by Professor Dr Bernhard Vogel is researching improvements to the ‘ART’ (= Aerosols and Reactive Trace gases), which is part of the weather model.

As part of PermaStrom, meteocontrol is further developing the prediction system, taking account of grid operator requirements. "This means grid operators will be able to use the research results in the form of new forecasting models and make more reliable plans in the future. With the proportion of PV energy steadily increasing, this research will make a significant contribution to the better management of power grids and their stability," says Daniel Lassahn, meteocontrol Project Manager. The research project is funded with a total of 2.5 million euros by the Federal Republic of Germany Ministry for Economic Affairs & Energy (BMWi) over a period of four years. The project was launched on 1 May 2020.

**About meteocontrol**

meteocontrol is the leading global provider of independent solar monitoring and control systems and currently monitors more than 48,000 PV systems with a total power output of over 16 GWp. For more than 40 years, meteocontrol has developed monitoring software and hardware for solar PV systems. They offer planning and commissioning of monitoring and control systems, as well as yield forecasts, technical due diligence, and energy and weather data analytics. As part of its consulting services and reports, the company has been involved in projects with a total investment of more than 14 billion euros. meteocontrol is a member of APRD Investment Group (Asia Pacific Resources Development) and is represented worldwide with its headquarters in Augsburg, Germany and numerous locations. [http://www.meteocontrol.com](https://www.meteocontrol.com/)

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**Visual material:**

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meteocontrol GmbH, the Karlsruhe Institute of Technology (KIT) and the German Meteorological Service (DWD) are researching the effects of aerosols on solar power production as part of the PermaStrom research project. Forest fires in the Alps in 2017, for example, coloured the Milanese evening skyscape a deep red and influenced cloud formation and solar irradiance.

Image source: meteocontrol GmbH / Daniel Lassahn