

## **Enhancements to the Bureau of Meteorology's Satellite-Derived Gridded Solar Resource Data**

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The Australian Bureau of Meteorology (the Bureau) is in the process of enhancing its suite of satellite-derived gridded solar resource data in several aspects. This paper will describe the completed and planned work towards this and update the user community on the solar data products available from the Bureau.

The improved ability, compared to previous satellites, of the current Himawari-8 satellite to characterize the atmosphere and clouds is exploited by using a new physical model to process satellite image data to grids of instantaneous surface solar irradiance. The new model, called Heliosat-4 and developed by partners at MINES ParisTech, France, inputs cloud macroscopic and microphysical properties derived from Himawari-8 data. This model also allows the introduction of information on the amount and type of aerosols in the atmosphere. Aerosols, such as dust, smoke and urban haze, affect surface irradiance levels, particularly for the direct beam radiation used by concentrating solar applications. Finally, the Heliosat-4 model extends coverage of the Bureau data to the oceans, and outputs the direct component directly rather than requiring an empirical model to separate the global radiation into direct and diffuse components.

Other enhancements are being implemented in response to user feedback. One of the most noteworthy changes will be the delivery of the gridded irradiance data in near real time. The temporal resolution of the irradiance data will increase from hourly to ten minutes, taking advantage of the higher temporal frequency of Himawari-8 data. Methods to move to finer spatial resolution than the current 0.05 degrees (~5 km) are being investigated.

The paper will also highlight activities being coordinated by Task 16 of the International Energy Agency's Photovoltaic Power Systems Programme that support improvements being made to solar resource data for Australia.