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**CO-MINIT: Solar measurement technology for Australian research facility**

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National Solar Energy Centre (NSEC) in Newcastle

The Australian National Solar Energy Centre (NSEC) has commissioned the German Aerospace Center (DLR) to supply a measurement system and carry out a series of measurements to type a new solar test field.

The key part of the remit is the development of a solar radiation measurement system within the framework of the CO-MINIT project funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. As part of this project, the output measurement system was developed at a small solar chimney power station in Italy.

For the project commissioned by NSEC, a replica of the CO-MINIT system is being used. The NSEC, part of the Commonwealth Scientific and Industrial Research Organisation (CSIRO), is located in Newcastle, about 150km north of Sydney. Here, construction work is currently underway on a solar chimney consisting of 200 mirrors or 'heliostats', each measuring 4.3m<sup>2</sup>, and a 25m-tall chimney.

The heliostats follow the movement of the Sun in the sky such that the reflected solar radiation strikes a focal point at the top of the chimney. With the Sun's rays concentrated 1000 times, temperatures in excess of 1000°C can be achieved at this focal point. The maximum radiant power at the focal point is 500 KW.

The radiant power at the focal point is not constant but depends on factors such as the time of day and the strength of the solar radiation. Knowledge of this power level is essential in order to assess the potential power output of solar energy conversion systems. So NSEC commissioned DLR to deliver the measurement system in order to establish the radiant power.

Another aspect of the remit is the implementation of an initial series of measurements in Australia to establish the maximum concentration of the heliostats and their performance data.

The measurement system consists of a special video camera with optical filters, an analyser and a pivoting, white-coated plate. To perform a measurement, this white plate moves quickly through the focal point while the video camera records the reflected solar radiation. The intensity and distribution of the solar radiation that strikes the plate is then worked out using a special method of calculation. This procedure allows us to determine the power of the concentrated solar radiation striking the focal point.

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