



7. GUEST ARTICLE

GeoModel SOLAR

GeoModel Solar is the developer and operator of the SolarGIS database. We help our clients reduce uncertainty in solar energy investments by delivering bankable solar resource data and reports required in planning, financing and operation of solar power plants. Our company brings 13 years of experience in solar energy, and has delivered bankable assessment of solar resource and PV electricity yield for more than 260 projects in 5 continents. In 2011, by introducing SolarGIS in India we achieved an important milestone towards reducing uncertainty of solar resource estimates in India.

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7.1 WHAT MAKES A SOLAR RESOURCE ESTIMATE BANKABLE?

The last 2 years in the Indian solar industry have been a learning phase. One of the lessons learned has been the importance of having a bankable solar resource assessment. Below we describe the best practices to follow in order to ensure that banks do not have doubts about solar resource potential at a project site.

Long time record (minimum 10 years): Variation in global radiation in India can be as high as 10% from year to year. Only 1-2 years of ground measurements are not enough for proper climate characterization. The general rule is to use solar radiation data that covers continuously a period of at least 10 years. The most important for India are the recent years, as increasing air pollution in the last two decades has likely affected solar resource. SolarGIS data is available for any location in India for a period of more than 14 years (1999 until today).

High spatial and temporal resolution: Detailed data is required to accurately represent local climatic features. The industry standard is to use data with level of spatial detail 4 km x 4km or better. SolarGIS data represents a spatial resolution of 250 m x 250 m and 30-minute measurement frequency.

Many consultants still use monthly data or synthetic hourly data for PV energy simulation. However, to obtain a bankable estimate of energy potential, hourly (or more detailed) time series

data is required. Use of hourly TMY (Typical Meteorological Year) data is also acceptable provided inter-annual variability is calculated from a multi-year time series dataset.

Low uncertainty proven by validation: It is important that the data source is proven to be accurate by independent experts. Many data providers claim to offer solar data with low uncertainty. However, SolarGIS is the only data source that has been independently validated with high-quality ground measurements from India that are available in public domain (from C-WET). Other international data comparison studies also position SolarGIS as the most accurate database on the market.

Use of ground-measured data: Recent improvements in satellite-derived data brought about by us have made the use of ground-measured data irrelevant for small PV projects (size approx. < 5 MW). For large projects it can be useful to have 12+ months of local measurements to reduce uncertainty by 1-3%. However, if ground measurements are used, it must be quality controlled by an expert to ensure that there are no errors in the data. In India, where there is high air pollution, ground sensors must be cleaned optimally every day in order to obtain a reliable verification dataset.

Continuity of data: SolarGIS database is updated every day, thus the recent data can be used for evaluation of a PV project performance after 1 or 2 years of operation. Advantage is that the same source of solar data can be used for longterm prediction and later for verification of the actual power production.