

Comparative Analysis of the Third Generation of Research Data for Evaluation of Solar Energy Potential

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Abstract : Renewable energy sources are dependent on climatic variability, so for adequate energy planning, observations of the meteorological variables are required, preferably representing long-period series. Despite the scientific and technological advances that meteorological measurement systems have undergone in the last decades, there is still a considerable lack of meteorological observations that form series of long periods. The reanalysis is a system of assimilation of data prepared using general atmospheric circulation models, based on the combination of data collected at surface stations, ocean buoys, satellites and radiosondes, allowing the production of long period data, for a wide gamma. The third generation of reanalysis data emerged in 2010, among them is the Climate Forecast System Reanalysis (CFSR) developed by the National Centers for Environmental Prediction (NCEP), these data have a spatial resolution of 0.50 x 0.50. In order to overcome these difficulties, it aims to evaluate the performance of solar radiation estimation through alternative data bases, such as data from Reanalysis and from meteorological satellites that satisfactorily meet the absence of observations of solar radiation at global and/or regional level. The results of the analysis of the solar radiation data indicated that the reanalysis data of the CFSR model presented a good performance in relation to the observed data, with determination coefficient around 0.90. Therefore, it is concluded that these data have the potential to be used as an alternative source in locations with no seasons or long series of solar radiation, important for the evaluation of solar energy potential.

Keywords : climate, reanalysis, renewable energy, solar radiation

Conference Title : ICETECE 2019 : International Conference on Environmental, Technological and Economic Challenges for Energy

Conference Location : Lisbon, Portugal

Conference Dates : April 16-17, 2019