

**P4** The application of Weather Research and Forecast (WRF) and NCEP Climatic Database Modeling for Global Horizontal Irradiance (GHI) assessment in Thailand.

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This research aims to present the the application of Weather Research and Forecast (WRF) and NCEP R1 reanalysis climatic database for solar resource assessment in Thailand. The WRF atmospheric model along with the NCEP reanalysis climatic database are applied with nested grid of 29 km for the first domain and of 9 km for the second domain as well as WSM3 micro-physics scheme with radiation physics scheme for long-wave and short wave of RRTM and Dudhi and cumulus parameterization of Kain-Fritsch to generate short-wave radiation above ground level to identify the potential areas for the development of solar farm project. The predicted short-wave radiation, i.e., Global Horizontal Irradiance (GHI) is validated using observed GHI from 8 met stations installed across the country. The Measured/Predicted ratios (M/P) and Percent Mean Relative Errors (PMRE) are analyzed to validate the predicted GHI. Results show that for the potential areas for the development of solar farm power plant in Thailand are located mainly in the Northeastern, North and Central Thailand with the annual average GHI is in the range of 22-24 MJ/m<sup>2</sup>/day. The average M/P ratio and the PMRE throughout the country are 0.91-1.12 and 6.21-28.17%, respectively.