IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 1, September 2024

# Artificial Neural Network Approach for Analysis and Prediction of Solar Radiation and Wind Speed in Telecommunication Systems

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**Abstract:** *The use of renewable energy sources in the power grid is essential for maintaining economic growth, especially for many African countries. Therefore, these countries can also install advanced artificial intelligence technology in their airport's power system to capture renewable energy. The paper aims to propose a real-time power management algorithm for a distributed hybrid renewable energy grid. It continues with the network modeling with the integration of solar and wind power. A multi-objective approach is proposed for the maximization of the spatial spectral efficiency and the energy efficiency as a function of the number of wind turbines and solar photovoltaic panels. Radio parameters for a Mobile Wireless inter-operability Medium Access (WiMAX) technology are considered for the simulation in MATLAB software. The results are quite mitigated but theoretically promising for the integration of green energy into the current telecommunication systems.*

**Keywords:** Artificial Neural Network (ANN); Green Energy; Solar Energy; Wind Energy; WiMAX Technology; Multi-Objective Problem; Power Generation Optimization; Theoretical Formulation


DOI: 10.48175/IJARSCT-19568
ISSN 2581-9429 IJARSCT