

Wind Power Potential in Selected Algerian Sahara Regions

Authors : M. Dahbi, M. Sellam, A. Benatallah, A. Harrouz

Abstract : The wind energy is one of the most significant and rapidly developing renewable energy sources in the world and it provides a clean energy resource, which is a promising alternative in the short term in Algeria. The main purpose of this paper is to compare and discuss the wind power potential in three sites located in the Sahara of Algeria (south west of Algeria) and to perform an investigation on the wind power potential of the desert of Algeria. In this comparative, wind speed frequency distribution data obtained from the web site SODA.com are used to calculate the average wind speed and the available wind power. The Weibull density function has been used to estimate the monthly power wind density and to determine the characteristics of monthly parameters of Weibull for these three sites. The annual energy produced by the BWC XL.1 1KW wind machine is obtained and compared. The analysis shows that in the south west of Algeria, at 10 m height, the available wind power was found to vary between 136.59 W/m² and 231.04 W/m². The highest potential wind power was found at Adrar, with 21h per day and the mean wind speed is above 6 m/s. Besides, it is found that the annual wind energy generated by that machine lies between 512 KWh and 1643.2 kWh. However, the wind resource appears to be suitable for power production on the Sahara and it could provide a viable substitute to diesel oil for irrigation pumps and rural electricity generation.

Keywords : Weibull distribution, parameters of Weibull, wind energy, wind turbine, operating hours

Conference Title : ICMCE 2015 : International Conference on Materials and Chemical Engineering

Conference Location : Jeddah, Saudi Arabia

Conference Dates : January 26-27, 2015