Wind Energy Potential of Jordan

ABSTRACT

The daily mean wind speed data for 5 locations in Jordan over a period of 9 years are collected and analyzed. Data are fitted to the Weibull distribution function. Weibull parameters are derived from the cumulative function of the observed data records (1989-1997), and used to calculate the mean wind speed and variance of the theoretical distribution. The goodness of representing the observed distribution with the Weibull distribution is determined using the Kolmogorov-Smirnov (K-S) test. At the 1% and 5% levels of confidence the observed data are well represented by the Weibull distribution. The annual mean values of the wind speed of the observed and theoretical distributions are 6.10ms-1 and 6.26ms-1 for Ras.Monief, 4.79ms-1 and 4.77ms-1 for Aqaba, 3.07ms-1 and 3.15ms-1 for Amman and 3.09ms-1 and 3.13ms-1 for Irbid and 2.34ms-1 and 2.40ms-1 for Der Alla respectively. Based on the annual wind speed, wind resource forRas.Monief, Aqaba, Amman, Irbid and Der Alla are varied from very good to poor. The annual mean power density of Ras.Monief, Aqaba, Amman, Irbid and Der Alla are 261.76 Wm-2, 118.95 Wm-2, 57.45 Wm-2, 40.95 Wm-2, and 24.97 Wm-2 respectively. Values of the power density obtained from the manufacturer's power distribution curve of a 300MW wind turbine at a hub height of 10 meters are also given for comparison. The result of the analysis showed that only Ras.Monief and Aqaba have good wind energy potential.