Analysis of wind speed data and annual wind energy potential at three selected sites in Iraq has been investigated in this study. The wind speed data was collected from the Weather Underground Organization (WUO) at stations elevation. Extrapolation of stations elevations used to estimate the wind velocities at 60 m, 90 m, and 120 m via wind shear law. The objectives were to analysis of wind speed data and to assess the wind energy potential for the selected sites. Computer code for MATLAB software has been developed and written to solve mathematical model. Results in the form of the measured and Weibull estimated of monthly and annual average of wind velocities ($\bar{V}$), wind shear, wind velocity carrying maximum energy ($V_m^E$), most probable wind velocity ($V_{mp}$), probability density function (PDF), cumulative distribution function (CDF), monthly and annual wind power density (WPD) and wind energy density (WED) were presents. At stations elevation,
the (WED) was the best for Basrah, Amarah, and Nasiriyah respectively and the selected sites are suitable for off grid applications. While at selected heights it was best for Basrah, Nasiriyah, and Amarah respectively. Basrah at (60, 90, 120 m) and Nasiriyah at (120) are acceptable for connecting to power grid.

References

Index Terms

Computer Science  Information Sciences

Keywords

Weibull distribution, assessment of wind resource, Wind energy potential, Analysis of wind speed data.