

Title: Assessment of wind energy potential and the economics of wind power generation in Jos, Plateau State, Nigeria.

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Abstract: This paper statistically examines wind energy potential in Jos, Nigeria using 37-year (1971–2007) wind speed data measured at 10 m height subjected to 2-parameter Weibull analysis. The results showed that Jos falls under Class 7 of the International system of wind classification by recording annual values of mean wind speed, average power density and energy of 8.6 m/s, 458 W/m² and 4013 kWh/m²/year respectively, making the site very suitable for wind turbine applications. A technical assessment was also made of electricity generation using two commercial wind turbines, AN Bonus 300 kW/33 and AN Bonus 1 MW/54 through the computation of their respective capacity factors, annual power and energy outputs. Furthermore, the economic feasibility of using the two wind energy conversion systems for electric power generation gave estimated costs of € 0.025, € 0.026 and € 0.015, € 0.016 per kWh of energy produced under two different values of annual operation and maintenance costs of 15 and 25% total initial cost respectively.