

## ABSTRACT

In the field of investment in the production of electric energy, the government of Libya has assigned Libya electric co. Beginning in the year 2009 the officer conducted a survey of wind speed and the environment of the Sahara Desert. The survey showed that the wind speed in the Sahara Desert is of grade 4 and 5. Therefore it is suitable for wind turbines to produce electrical energy.

The objectives of this research are conducting studies and research on the possibility of producing electrical energy in the desert using wind turbines, how to choose any wind turbine design that is appropriate for the Sahara Desert and includes the capital of the wind turbine, analysis of wind turbines and whether they are suitable for producing electricity from the desert using MATLAB.

In this research will make input data the wind speed data, blade of turbine and wide of rotor need to be calculated first. After that, the calculation of the torque and turbine rotation is carried out. From these two calculations, the real power production and power production will be known to determine the performance of conventional calculations, the fuzzy Mamdani algorithm is embedded in the calculation to get the RPM and torque and the power generated by wind turbines. Thus, both performance can be seen as the basis for planning wind power plants in Libya.

The conclusion from this research is that electrical energy can be produced in the desert resulting from converting kinetic energy into electrical energy using turbines, but this depends on several factors, namely the location and the wind speed. The study provides the capacity factor and availability of this resource. Moreover, studying the variables allows for a preliminary assessment of the extent to which wind energy can be used as the primary power source. Fuzzy Logic algorithm have shown the results about the potential for producing and investing wind energy in the Sahara Desert.

**Keywords:** Wind Turbine Energy, Wind Capacity Production, Wind Energy Potential