Assessment of using wind energy for pumping water: a case study from Ténès (Algeria)

F. Boukli Hacène, N. Kasbadji Merzouk, C. Abdelbaki, E. Sheu, Y. Bouhadda

Preparatory School in Sciences and Technology, Tlemcen, Algeria, Tel. +213 43 20 43 30; email: bhfouad@yahoo.fr
Development Unit of Solar Equipments UDES/CDER, Bou Ismail, W. Tipaza UR4201, Algeria, Tel. +213 24 41 01 33; email: nkmerzouk@gmail.com
Faculty of Technology, Department of Hydraulics, University of Tlemcen, Tlemcen, Algeria, Tel. +213 43 41 00 12; email: abdelbakicherifa@gmail.com
Vanton Research Laboratory, 2525 Stanwell Drive, Suite 300, Concord, CA 94520, USA, Tel. +1 925 687 7814, +1 925 687 7817; email: ericsheu@vantonlab.com
Physical Chemistry Laboratory of Macromolecules and Biological Interfaces, Mustapha Istambouli University, Mascara, Algeria

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ABSTRACT

This work assesses the feasibility of using wind energy for pumping water to supply the Ténès region in Algeria. The assessment starts with taking the velocity data and the direction of the wind acquired at 10 m height to establish a statistical analysis model using the Weibull distribution. This developed wind power model is then correlated to the water flows via data collected in two local turbine pumps. The Weibull parameters were derived monthly through water pumping data from the Ténès water pump stations and the results are extrapolated to 45 m AGL (i.e. the wind turbine height) empirically. The wind direction variation is recorded and incorporated into the model. In addition, the efficiency of the pumping systems is also evaluated. The results obtained suggest that water flow predicted by this model can supply the needs of population of Ténès.

Keyword: Wind power; Weibull distribution; Wind turbine and water flow

*Corresponding author.

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