

Abstract

In the following work, we propose an assessment of wind potential in Algeria. The purpose of this study is twofold. First, to draw the attention to the important wind potential in the region of Hassi-R'mel ≈ 6 m/s. In the previous maps, the wind potential in this region has been underestimated due the fact that it is located between two less windy regions. Second, the actualization of the wind map of Algeria using very recent data stretching from February 2004 to December 2009. This paper is structured in three main parts. First, a stochastic and the cyclic study of the wind behaviors in the site of Hassi-R'mel are proposed. The stochastic study is carried out by fitting the wind speed data to Weibull distribution while the cyclic study is carried out via the use of time-frequency analysis. We have used the time-frequency analyses instead of the traditional Fourier analysis due its ability to follow the spectrum variation with respect to time. As results, it has been found that spectrum wind process enfold many limited interval oscillations. In the second part, we propose to contribute to the actualisation of the wind map in Algeria. In this part, we have considered also the topographical aspect of Algeria. Such consideration is very helpful for understanding the wind potential repartition over the country. Finally, a techno-economical study of a stand along hybrid system (wind/diesel) in the site of Hassi-R'mel is considered. Via this study, it has been found that the site of Hassi-R'mel is very adequate for wind energy conversion systems