Assessment of Wind Generation Potentiality and Site Matching of Wind Turbines in Algeria

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Abstract

Wind data gathered at 10 m high is based on the atlas of the wind of Algeria established by the National office of the Meteorology runs 37 stations of measures. The data is used for a feasibility analysis of optimum future utilization of Wind generator potentiality in 14 sites covering all landscape types and regions in Algeria. A mathematical formulation using a two-parameter Weibull wind speed distribution is further established to estimate the yearly mean wind speed and the yearly average available wind energy flux for each site. Detailed technical assessment for the ten most promising potential wind sites was made using the capacity factor. The investigation was performed assuming twelve models of small, medium and big size wind machines representing different ranges of characteristic speeds and rated power suitable for water pumping and electric supply. The results show that small wind turbines could be installed in some coast region and medium wind turbines could be installed in the high plateau and some desert regions and utilized for water supply and electrical power generation, the sites having an important wind deposit, in high plateau we find Tiaret site's but in the Sahara there is some sites for example Adrar, Timimoun, In Amenas and In Salah, in these sites could be installed a medium or a big size wind turbines, provided the correct wind machine-site is selected.
References

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Index Terms

Computer Science

Power Systems

Keywords

Wind energy  Wind characteristics  wind speed distribution  capacity factor