A Clustering Approach to Analyze the Wind Energy Potential of Mardin

Fadime Üney-Yüksektepe
Istanbul Kültür University
Turkey

Abstract

Due to the increasing interest in renewable energy resources, wind energy become an important energy source. Especially, wind turbines that are used in high efficient areas begun to contribute to city energy needs. At this research, according to direction and speed of wind obtained for Mardin region, clustering algorithms are studied in order to determine the days that have the same wind characteristics. To perform these studies, clustering and classification methods at WEKA data mining software are benefited. First, the raw data is preprocessed by calculating the daily average speeds and different clustering methods are studied on this constructed data. The clustering method that gives the best result was selected by comparing the accuracy values of classification methods on the obtained clusters. The results of best clustering method are investigated to obtain the average wind speed and energies for these clusters. The number of turbines necessary to obtain the predetermine power energy potential are obtained by using well-known energy calculations. Finally, the weighted blowing direction of wind at this area is found by using Pavan Aarekh program. As a result of this study, firm that plans to build wind plant in Mardin obtain information about the number of wind turbines and their installation directions.