Electricity Generation from Renewables and Targets: An Application of Multivariate Statistical Techniques

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Abstract : Renewable energy is referred to as "clean energy" and common popular support for the use of renewable energy (RE) is to provide electricity with zero carbon dioxide emissions. This study provides useful insight into the European Union (EU) RE, especially, into electricity generation obtained from renewables, and their targets. The objective of this study is to identify groups of European countries, using multivariate statistical analysis and selected indicators. The hierarchical clustering method is used to decide the number of clusters for EU countries. The conducted statistical hierarchical cluster analysis is based on the Ward’s clustering method and squared Euclidean distances. Hierarchical cluster analysis identified eight distinct clusters of European countries. Then, non-hierarchical clustering (k-means) method was applied. Discriminant analysis was used to determine the validity of the results with data normalized by Z score transformation. To explore the relationship between the selected indicators, correlation coefficients were computed. The results of the study reveal the current situation of RE in European Union Member States.
Keywords : share of electricity generation, k-means clustering, discriminant, CO2 emission

Conference Title : ICKEDM 2016 : International Conference on Knowledge Engineering and Data Mining
Conference Location : Copenhagen, Denmark
Conference Dates : June 27-28, 2016