Geophysical Research Abstracts
Vol. 15, EGU2013-12942, 2013
EGU General Assembly 2013

Characterization of the Wind Power Resource in Europe and its Intermittency

Alexandra Cosseron, Bhaskar Gunturu, and Adam Schlosser
France (alexandra.cosseron@polytechnique.org)

Thanks to incentives from the European Union and recent events, the political situation in Europe has never been so favorable towards renewables. As one of the most mature technologies among them, wind power has been chosen to be assessed over Europe, with a special care given to intermittency and variability quantifications. The goal of this study is to construct and analyze the availability and variability of the wind potential across Europe using the methodology developed in Gunturu and Schlosser (2011). The Modern Era Retrospective-Analysis for Research and Applications (MERRA) boundary flux data was used to construct wind profiles at 50, 80, 100 and 120 meters height over a domain spreading from Iceland to the western end of Ukraine. Comparisons and contrasts with previous works have asserted the reliability of the data and computations used in the analysis. It must be emphasized though that the data set used in this study has a thirty-year length, a time resolution of an hour and is a reconstruction of the atmospheric state by assimilating observational data from different platforms into a global model. Various metrics, such as coefficients of variation, inter-quartile ranges, capacity factors and wind episode lengths, have been introduced to assess magnitude and variability of wind power. Then, unconventional variables have been designed to further study the availability and reliability of this resource. Thus, to study the correlation between wind episodes across Europe, parameters called antiCoincidence and antiNullCoincidence have been built. Pragmatically, the seven closest grid points in each direction at every grid point have been studied to assess whether they had wind when the considered point had or had not. The analysis of these variables leads to the conclusion that wind-proponents' favorite statement, "wind always blows somewhere", may not be so true. All of these metrics have finally allowed a better understanding of wind power features over Europe.

[Gunturu and Schlosser(2011)] Udaya Bhaskar Gunturu and C Adam Schlosser. Characterization of Wind Power Resource in the United States and its Intermittency. Technical Report 209, MIT Joint Program on the Science and Policy of Global Change, Cambridge, MA, USA, 2011.