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Seasonal and spatial variability of wind climate in the Carpathian Basin

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Among renewable energy resources, wind energy utilisation increased most intensely during the last decade. The sudden and widespread wind technological developments raised the question of the effectiveness of wind energy utilisation in moderate wind regions, such as the Carpathian Basin. In order to support EU and national governmental efforts and to facilitate initiatives on renewable energy consumption a research started on estimating and mapping potential wind resources of Hungary.

Based on the latest ten-year-long (1997-2006) data sets of 37 Hungarian climate stations time series analysis and complex wind climate research were carried out, basic and supplementary wind characteristics were calculated applying a methodology corresponding to the European Wind Atlas. Then, wind atlas of the region has been compiled. In order to analyse the most important characteristics of wind field modification effects of topography and roughness were evaluated, horizontal and vertical extrapolations of measured wind data were carried out in several case studies for different regions of the country. Wind speed map of Hungary has been simulated for different levels using a mesoscale wind model. Finally, seasonal and annual variability of wind field was estimated.