



Uncertainty of wind power estimation using standard meteorological measurements and forecasts

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Industrial use of wind in energy production was started at the end of 2000. Currently, the total power of wind turbines nationwide is around 20 MW. By the end of 2010, 3.6% of the total electric power production is planned to be covered by renewable energy. The most windy part of Hungary is Western Transdanubia (the western part of the country) with an annual mean of 3-3.5 m/s. With the aid of (i) low cut-in speed, high mast new generation wind turbines - suitable for continental wind climate conditions - and (ii) government grant, wind may become an economic source of energy even in Hungary. On the Small Hungarian Plain (adjacent to Burgenland, Austria) a wind energy system with a total power of 150 MW is in realization. An additional 280 MW is in the authorization stage. One major obstacle to the development is the Hungarian electrical supply network, which can only receive an electrical production of 800 MW, but even above 200 MW, major network deviation is expected due to the variation in the wind speed. The most important issues are the availability of the actual power and the prediction of expected production. For the prediction wind profile estimations are essential. Power production data of a wind turbine - located at the Small Plain (approximately 80 km away from Vienna) - are compared to (i) measurements at a neighboring weather station, (ii) wind prediction of the Hungarian Meteorological Service. Possible reasons of the deviations are discussed in details, including wind direction, stability and the applied profile estimation.