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# A novel method to optimize electricity generation from wind energy

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## HIGHLIGHTS

- Data recognizer wzip is used to anticipate favorable periods of wind energy
- The method can also be used to analyze wind energy production
- Data from all German turbines during 2010:2017 is used in this study
- A protocol for mixing wind energy with conventional sources is proposed
- Protocol indicators are tested on monthly basis during the eight-year period

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## Abstract

We present and discuss a new technique based on information theory to detect in advance favorable periods of wind activity (positive ramps) for electricity generation. In addition this technique could also help in the analysis of plant operation and management protocols design. Real data from wind power plants in Germany is used; this information is freely available in the internet with reliable registers every 15 minutes. A simple protocol to mix such wind energy production with electricity coming from conventional sources is proposed as a way to test the proposed algorithm. The eight-year period 2010-2017 is analyzed looking for different behaviors in wind activity. The first five years (2010-2014) are employed to calibrate the method, while the remaining three years (2015-2017) are used to test previous calibration without any further variation in the tuning possibilities described below.

Thus, the proposed protocol is tried on under different seasonal wind conditions. Both the algorithm and the general protocol could be adjusted to optimize performances according to regional conditions. In addition, this algorithm can also be used in retrospective studies to adjust productivity to operational conditions.

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