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MARKETING WIND POWER ON ELECTRICITY WHOLESALE MARKETS – AN ANALYSIS OF DIFFERENT OPTIONS

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Overview

Feed-in tariff schemes for promoting electricity from renewables are uncoupled from electricity wholesale markets and therefore even attract investors from non-energy sectors and private initiatives. After the supporting period these actors generally have to trade their electricity on conventional markets. For wind energy marketing options are limited due to its volatile characteristic, which imposes a big challenge especially for small players. In this respect the question arises, which structures are necessary for an optimised wind power marketing in the future?

Methods

In order to answer this question the market value of wind power is analysed within a case study carried out for a sample of 22 wind sites in Austria. Thereby the following marketing options are investigated:

- no trade at all (in this case the revenue is determined by the clearing price for imbalances)
- trade on the spot market (based on perfect vs. real wind power forecasts)
- trade on long-term as well as spot market (based on perfect vs. real wind power forecasts)

Further the reduction in value related to the variability of wind power and due to imbalances under different wind power forecast scenarios is determined. Analyses are based on historical wind power data, meteorological data and forecasts and wholesale power market prices. Results are finally compared with empirical data available for other European countries and with numbers from recent studies based on system analyses.

Results

The evaluation of the quality of wind power forecasts and related cost for imbalances for different clusters of wind sites shows that highest cost reduction potentials are realised for aggregated forecasts of a few locally dispersed sites compared to a single site forecast.

The added value of a perfect wind power forecast is in the range of 11 to 14 €/MWh of which 1.8 to 5.5 €/MWh can be realised using real forecasts. The implementation of a continuous day ahead market allows for an additional revenue of about 3.5 €/MWh compared to the marketing under the current regulatory framework in Central European power markets (see Figure 1).

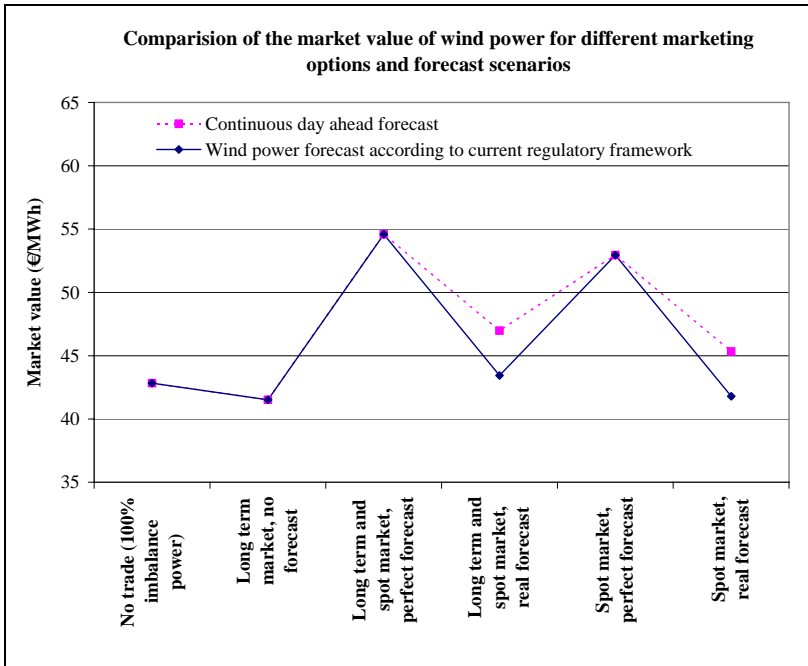


Fig. 1: Market value of wind power for different marketing options and forecast scenarios

Assumptions: Cumulated installed capacity 90 MW (22 sites); period 07-2005 to 06-2006; prices based on EEX data; prices for quarterly base products based on average futures prices of the previous trading quarter.

Conclusions

The results show, that an optimised marketing of wind power can even be realised within decentralised structures i.e. for moderate levels of aggregation of wind sites. Furthermore the market integration can be improved considerably by implementing continuous day ahead markets in Central European Countries as a first step (following the case of the Nord Pool). Under such a regulatory framework the added value of wind forecasts is even considerable when applying simple forecast approaches.