THE RENEWABLES INFLUENCE ON MARKET SPLITTING: THE IBERIAN SPOT ELECTRICITY MARKET

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Overview

This paper aims to assess the influence of wind power generation on the market splitting behaviour of the Iberian electricity spot markets.
We use logit models to express the probability response for market splitting of day-ahead spot electricity prices together with explanatory variables like wind speed, available transmission capacity and electricity demand.
The results show that the probability of market splitting increases with the increase of wind power generation. Also the European interconnection capacity target of 10% of the peak demand of the smallest interconnected market has to be reconsidered, in order to keep electricity market integration a reality.

Methods

The estimated models aim to provide indications about the behaviour of the market splitting mechanism in the Iberian spot electricity markets, considering the wind power penetration in these same markets. We have modelled the probability of market splitting as a function of relevant explanatory variables related with wind power generation and market splitting mechanism.
In this study the wind speed is the main explanatory variable used in our models, expressing the amount of electricity generated from wind energy sources. The two other explanatory variables used are related with demand of each country and the ATC between both spot electricity markets.

Results

Prediction results from the models express that market splitting probability increases when the wind speed is higher, consequently with higher wind power generation. This can be explained by having low marginal cost electricity available to flow across the border. With low average wind speeds in Spain the market splitting probability responds quite drastically to an increase in the Portuguese wind speed, whilst this effect looses its influence when the average wind speed increases in Spain.
Market splitting probability decreases with increasing ATC (allowing higher flows of electricity between markets), as one could expect by the concept definition of market splitting.

Conclusions

One of the benefits of the integration of spot electricity markets is the optimization of RES-E generation. The influence of high penetration of wind energy source electricity generation and its integration, together with the requirement to achieve an Iberian integrated electricity spot market is herein studied. Market splitting behaviour was modelled through logit models estimating the probabilities of its occurrence.
As demonstrated, investment in interconnection capacity has to follow the investment and deployment of further wind power capacity, so coordination policies governing both interconnection development and renewable incentives should be designed. Also, as an indicative requirement, additional interconnection capacity to reach 3700 MW is required if Iberia doubles its available wind power generation, or any other low marginal cost generation, in the system.

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