

From passive to active actors in the power market: Regulatory barriers and business opportunities for wind power plants

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Motivation

In the market integrating, wind power plants themselves have the technical potential of offering flexibility. However, regulatory barriers, limited market access, together with the presence of incentives to produce regardless of system requirements, hinder the potential benefits from a system-friendly integration and reduce the economic value of wind energy.

Problem Statement

In many countries wind have been given priority access and support outside the power market. This has been beneficial for the early deployment but it also limits the business cases for wind and increases the system cost for integration. In a future with more market integration, a more active role of wind is expected. This requires a rethinking of the regulatory and market design.

Methodology

Nordic countries are at the forefront of integrating wind energy into their power system and in creating framework conditions that facilitate this. Thus, we use the Nordic countries as a case study. We survey and discuss the regulatory barriers that limit market access and the possibility of wind power plants to create new business models as they react to market prices and seek to deliver balancing services. First, we look at the existing support mechanisms for wind power producers and how they interact with the power market. We then examine wind power plants' access to intraday and balancing markets. Finally, we discuss how to remove the regulatory barriers and then examine the business opportunities that will ensue as a result. We conclude the paper with a discussion of the findings and how they could be implemented in other power markets such as the South African power market and power pool.

Results

We show that support mechanisms should not only be exposed to market signals, such as the wholesale price of electricity, as in the case of feed-in-premiums or green certificates. At the same time, it is also important that the wind power operator has an explicit incentive to act flexibly, e.g. by curtailing or downscaling production in the context of negative or very low prices.

Presently, as the day-ahead spot market is more liquid, wind power plants utilise the intraday and regulatory power markets at the NordPool power exchange for a limited amount of trade. This is due to the regulatory structure, existing market access rules and historical patterns.

Our findings suggest new market mechanisms with which to operationalise the concepts, which could be important inputs for the design of future power markets with a high share of wind power.

Conclusions

We reveal that wind power plants could have a more solid business case if they become more active on the different markets, e.g. intraday and balancing markets.

This will ease the integration of wind, and increase the value of wind.