

Blowin' in the Wind: Sequential Markets, Market Power and Arbitrage*

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May 4, 2014

Preliminary and incomplete, comments welcome

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Abstract

We study strategic behavior of wind farms in electricity markets, and examine their dynamic adjustments through sequential markets. Wind production is uncertain and volatile, with the degree of uncertainty being reduced over the day. Therefore, sequential forward markets can improve market efficiency through information updating. However, pre-existing distortions such as market power and limited arbitrage may distort incentives to reveal accurate production forecasts. By using micro-level data in the Spanish electricity market, we show that wind farms exploit a forward market price premium, overstate their production over 20% at the day-ahead market, and only slowly adjust their commitments to expected production, increasing the dynamic inefficiencies from wind misplanning. Consistent with the premium being driven by market power, wind farms that have market power do not exploit the price premium, whereas competitive fringe farmers do the arbitrage. Our results show how pre-existing distortions can have unintended consequences in the market, making the integration of wind power even more challenging.

*Emails: ito@bu.edu, mreguant@stanford.edu. We thank Simon Board, Severin Borenstein, Ryan Kellogg, Chris Knittel and Matt White, as well as participants at the Stanford IO lunch, UCEI Energy Camp, POWER Conference on Energy Research and Policy, IFN Stockholm, SITE Stockholm, University of Gothenburg, UCLA, MIT, TSE, PSE and École Polytechnique.