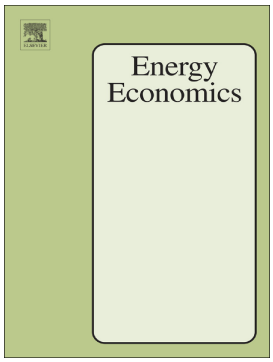

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Thorsten Engelhorn, Felix Müsgens

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How to estimate wind-turbine infeed with incomplete stock data: A general framework with an application to turbine-specific market values in Germany

Thorsten Engelhorn*, Felix Müsgens**
Brandenburgische Technische Universität Cottbus - Senftenberg, Forschungszentrum 3E, Siemens-Halske-Ring 13, 03046 Cottbus, Germany

*Correspoding author: Thorsten Engelhorn
Tel.: +49 (0)173-654 75 99
Email address: thorsten.engelhorn@gmx.de
Permanent address: Donnersbergstraße 16, 68163 Mannheim, Germany

**Non-corresponding author: Felix Müsgens
Email address: felix.muesgens@b-tu.de

Abstract
This paper analyses market values of wind energy converters at the individual turbine level on a very large scale. Such an analysis is usually precluded by the lack of detailed public data on the stock of wind turbines. We therefore present a general method to estimate incomplete turbine stock data and generate hourly yields of individual turbines based on completed turbine stock data and highly disaggregated hourly wind speed data. On this basis, we calculate hourly infeed and annual market values of up to 25,700 wind turbines in Germany from 2005 to 2015. We show the spread in market values on turbine level, quantify regional differences and discuss the effect of turbine age on market values. We show that turbines in central Germany have, on average, lower market values than turbines in the north, south or far west of Germany. Furthermore, we show that modern turbines reach higher market values than older turbines. We also analyse the drivers of market values, differentiating between infeed-price correlation and standard deviation.