

# ***INSIDER TRADING ON CONTINUOUS INTRADAY ELECTRICITY MARKETS? SOME EMPIRICAL EVIDENCE FROM GERMANY***

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## **Overview**

The process of energy market liberalization in Europe and the growth in the supply of electricity from intermittent renewable energy sources (RES) led to a significant increase in trading activities on wholesale electricity markets in Germany. Not least due to the European Commission objectives (i.e. the proclamation of the Energy Union), the various national markets should be integrated through mechanisms, such as market coupling in the day-ahead market and the intraday cross-border trading, to facilitate the flow of electricity between the different European jurisdictions. As these arrangements rely on trustable price signals, well-functioning markets should operate with an unbiased information set that reflects the supply and demand side fundamentals and is not distorted by abuse of market power. For this reason, the European authorities implemented a monitoring framework to detect and prevent market manipulations as this is an essential component of confidence building among market participants and energy consumers. These regulations cover the submission and publication of data in electricity markets (SPDEM) and are supported by the Regulation on Wholesale Energy Market Integrity and Transparency (REMIT). The main tasks of REMIT are the prohibition of insider trading and market manipulations. Moreover, many organized marketplaces request its participants to be compliant with self-imposed codes of conduct and to refrain from any influence of price formation.

This paper investigates the impact of unplanned power plant outages on wholesale electricity prices in Germany using data from the European Power Exchange (EPEX) day-ahead and continuous intraday markets and messages concerning unscheduled power plant non-usabilities that are published online at the European Energy Exchange (EEX) transparency platform. We segregate the content of these messages into private and public information about the outages and test whether they affect the intraday price.

The results of an econometric analysis point to a positive, significant impact of public information about unplanned power plant outages on the average intraday price during 2015 to 2016. In July 2015, to provide market participants more adjustment possibilities to actively balance their portfolios in close-to-real time, the EPEX reduced the lead-time from 45 minutes to 30 minutes for trading on the continuous intraday market. We show that this change in the market design leads to two contrary effects. Firstly, the increased flexibility reduces the impact of forecast errors of RES on the intraday price. Secondly, the impact of private information about unplanned power plant outages on the intraday price becomes positive and significant. Thus, insider trading may take place on the EPEX continuous intraday market, which is strictly prohibited by REMIT.

## **Methods**

Our dataset is comprised of approximately 2,500 messages regarding unscheduled non-usabilities of more than 100 MW including information about the respective power plant type, the duration and magnitude of the outage, and its publication timestamp. We choose outages that arrive in time to influence decisions concerning the intraday market, but not the day-ahead market. In particular, we segregate the content of the messages into two distinct explanatory variables: Private Information and Public Information. "Private Information" is the sum of missing capacities that may influence the intraday price only in the period from the beginning of the outage until its publication on the EEX Transparency Platform. Consequently, all missing capacities that may have an impact on the intraday price from the publication timestamp until the expected end of the outage are summarized in the variable "Public Information".

Supply-side shocks after the day-ahead gate closure cause open positions in the schedules of market participants and may induce trading activity on the continuous intraday market. Following Hagemann (2015) and Lazarczyk (2016), we regress the difference between the average intraday price and the day-ahead price on the missing capacities caused by unplanned power plant outages. Furthermore, we include a vector of control variables (RES forecast error, load forecast error, net exports) as well as a vector of dummy variables to control for seasonal effects.

## Results

The results for the total sample suggest that public information about unplanned outages has a positive, significant impact on the intraday price. Holding all other variables constant, the intraday price increases by 1.84 €/MWh if the publicly known missing capacities increase by 1000 MW. Private information about missing capacities does not have a significant impact. Although the sign of the coefficient is positive, the null hypothesis of 'no impact' cannot be rejected. As expected, an increase in the forecast error of RES (i.e., excess supply) has a negative impact on the intraday price. In contrast, an increase in the load forecast error (i.e., higher electricity consumption), as well as an increase in net exports, will lead to a higher intraday price.

However, our results change if we perform regressions for subsamples before and after the lead-time change. In the old 45-minute lead-time regime, private information about missing capacities does not influence the intraday price. After the regime switch, the results point to a positive and significant impact, implying that the electricity price is influenced by trades due to inside information about unplanned power plant outages. The impact of the RES forecast error decreases in absolute terms.

In order to test these remarkable differences between both subsamples for statistical significance, we multiply all explanatory variables with a policy change dummy and perform an additional regression. The results suggest that changes in the absolute value of the coefficients Private Information and RES forecast error are statistically significant.

## Conclusions

Taking everything into consideration, the results suggest that unplanned power plant non-usabilities have a positive, significant impact on the intraday price. We show that a reduction of the lead-time on the continuous intraday market results in two contrary effects: on the one hand, the impact of forecast errors of RES on the intraday price is reduced. This result might be an indicator of a better market integration of the renewables due to the increased flexibility of the continuous intraday market. On the other hand, trades due to inside information have a positive, significant impact on the intraday price. Consequently, the key objectives of REMIT are violated.

## References

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