

Electricity is one of the commodities, which has a significant impact on all branches of an economy. Therefore, for many years, the system stability was the major concern of governments and central authorities. The markets were typically managed by engineers, who concentrated on technological aspects of electricity generation and trade neglecting economic outcomes. As a result, the markets were noncompetitive and characterized by high generation costs and distribution inefficiencies.

In the recent decades, electricity markets across the world have undergone reforms, which have resulted in a deep market deregulation. The process led to creation of power exchanges, such as Nord Pool or EEX in Europe, PJM in the US and NEM in Australia. Nowadays, majority of the trade is done in spot day-ahead markets, where offers are placed around a noon of the day preceding the delivery. In order to allow for an adoption of a trading position to unplanned events, spot markets have been complemented by intraday and balancing markets. The **intraday markets**, typically organized by power exchanges, take the form of auctions (e.g., in Spain) or continuous trading (e.g., in Germany) and allow to trade the electricity throughout the whole day, up to a few minutes before the physical delivery. The final balancing of the demand and supply is achieved via balancing markets, which are controlled by system operators and aim at securing the system stability.

The main goal of the project is to **develop and evaluate forecasting methods suitable for short-term forecasting of intraday electricity prices**. Such predictions, from a few hours to a few days ahead, pay a decisive role in sale strategies of generation utilities. The research could be decomposed into three areas

- Investigation and evaluation of different statistical methods in the context of short term predictions of intraday electricity prices, with a particular interest in one day ahead forecasts.
- Quantification and evaluation of renewable energy sources (RES) impact on the level and distribution of intraday electricity prices
- Investigation and development of economic measures suitable for an evaluation of electricity price forecasts.

This research is planned to cover three most important areas of time series forecasting: variable selection, model specification and accuracy evaluation. Since the behavior of electricity prices differs significantly from other commodities and has unique properties, such as a presence of positive and negative (!) spikes, its forecasting requires development of new approaches and opens various research questions.

The outcomes of this project could, on one hand, increase our knowledge on mechanisms governing electricity markets and on the other hand, support the decision process of generators and distributor companies. This research complements the existing literature in various directions. First, it covers an area of day-ahead forecasting of intraday electricity prices, which has not been previously studied. Second, it evaluates the impact of RES and other factors on intraday electricity prices. The results could add to a discussion on an optimal electricity generation structure. Finally, investigation of different forecasting methods could improve our understanding of time series field and result in development of approaches useful for predicting behavior of other variables and markets.