Electricity price forecasting in the 2020s

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Abstract

Although electricity price forecasting aims at predicting both spot and forward prices, the vast majority of research is focused on short-term horizons which exhibit dynamics unlike in any other market. The reason is that power system stability calls for a constant balance between production and consumption, while being weather (both demand and supply) and business activity (demand only) dependent. The recent market innovations do not help in this respect. The rapid expansion of intermittent renewable energy sources is not offset by the costly increase of electricity storage capacities and modernization of the grid infrastructure.

On the methodological side, this leads to three visible trends in electricity price forecasting research as of 2022. Firstly, there is a slow, but more noticeable with every year, tendency to consider not only point but also probabilistic (interval, density) or even path (also called ensemble) forecasts. Secondly, there is a clear shift from the relatively parsimonious econometric (or statistical) models towards more complex and harder to comprehend, but more versatile and eventually more accurate statistical/machine learning approaches. Thirdly, statistical error measures are nowadays regarded as only the first evaluation step. Since they may not necessarily reflect the economic value of reducing prediction errors, more and more often, they are complemented by case studies comparing products from scheduling or trading strategies based on price forecasts obtained from different models.