

Modelling quarterly electricity prices

Background

In many European countries, electricity prices are determined based on trading at Nordpool power exchange. Historically, prices in each market changed each hour. These hourly changing prices are important both to give producers incentives for producing during the right times as well as giving consumers incentives to use electricity when production is large and prices are low.

Hourly prices, however, are still connected to giving some undesired incentives: If the price is high for one hour and it is known that it will drop to the next hour, some consumers might wait and start directly with high consumption when the prices switch. This potentially leads to an undesired peak in consumption. To reduce such effects, the hourly pricing was changed to quarterly pricing on October 1, 2025.

In this master's project, you investigate the effects of this change from hourly to quarterly pricing. One part is to develop a statistical model tailored to quarterly prices and modelling within-hour effects observed after the change. Another part is to investigate whether hourly prices before the change and hourly averages after the change behave differently or if there can be shown that other changes occurred like difference in volatility (variability) before and after October 1.

Regarding methods, you will start by describing observations descriptively. Then, you will work with time series models and try to fit the specific behavior of the quarterly prices by introducing a non-standard term for intra-hour effects. You will show differences before October 1 and after by different statistical techniques.

Data description

Swedish data for electricity prices before and after the change from hourly to quarterly will be analyzed.

Possible research questions

- Which time series model is good to fit quarterly electricity prices?
- How does the intra-hour profile of the prices look like?
- Is there larger volatility of quarterly prices compared to hourly prices?
- Do hourly (averaged) prices behave differently before and after the pricing-frequency-change?

Eligibility criteria

Some knowledge about time series analyses and interest in this topic.

Contact details

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