

EFFICIENT TEMPORAL ORGANIZATION OF SEQUENTIAL SHORT-TERM EUROPEAN ELECTRICITY MARKETS

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Extended Abstract

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Abstract Summary

Renewable sources of electricity generation continue to exhibit strong growth in Europe, introducing increased uncertainty to power systems. Short-term markets need to evolve to integrate these uncertain sources and flexible assets such as storage and demand response more efficiently. Power markets in Europe optimize dispatch over a 24-hour window with a fixed horizon at midnight each day. This research proposes a novel, multi-period market design with a rolling horizon and explores advantages and disadvantages compared to the current, fixed-horizon day-ahead and intra-day market sequence. The proposed design allows market agents to continuously adjust their bids as new forecast information becomes available and for the market operator to optimize dispatch of flexible assets without daily discontinuities. In a stylized case study based on the Netherlands, socioeconomic welfare for the proposed design is on par with the current design. System imbalance and VRES curtailment, however, are significantly improved with the proposed design, indicating that further research on rolling-horizon markets in the European context is needed.

Presenting Author Biography

Timothy Atkinson, MPPM, is a PhD candidate at Utrecht University. As a part of the Market Organization of the Dutch Energy System (MODES) project, his research involves the design of efficient short-term electricity markets for the Netherlands. Prior to UU, he worked in the private sector designing firmware and software for residential solar and energy storage power electronics products.