Reconciling markets and physics: A vision on European Electricity market design 2030 - 2050

Motivation

The European electricity system undergoes significant changes driven by a strong climate action agenda and related development of renewable energies. These changes take place at unprecedented speed and add further complexity to system operation and electricity markets, while also offering new opportunities. Today's market design in Europe has been successful in enabling a vast increase of electricity exchanges across countries, stimulating competition and increasing liquidity in wholesale markets. However, several limitations start to be visible for various reasons: Increasing loop flows, increasing redispatch costs to relieve grid congestions, limited information available on the electricity system flexibility and increasing investment uncertainty to ensure resource adequacy. Hence, reconciling markets and physics remains one of the key challenges in designing future-proof electricity markets not only on the national, but also the European level.

Source: ENTSO-E

Research Question

- How can markets and physics be thought together in a future-proof European market design?
- Do you think the zonal market model including the planned evolutions of the Clean Energy Package is suitable for the 2030 power system?

Contact

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Approach

- Structured literature review and discussion of different market design models in the European context
- Show up interdependencies between different market models in European countries as well as implications for practical implementation
- Starting literature: ENTSO-E (2021). Options for the design of European Electricity Markets in 2030. Retrieved from https://eepublicdownloads.entsoe.eu/clean-documents/Publications/Market%20Committee%20publications/210331_Market_design%202030.pdf