



TradeRES

New Markets Design & Models for
100% Renewable Power Systems

Options for a future ~100% renewable electricity market design

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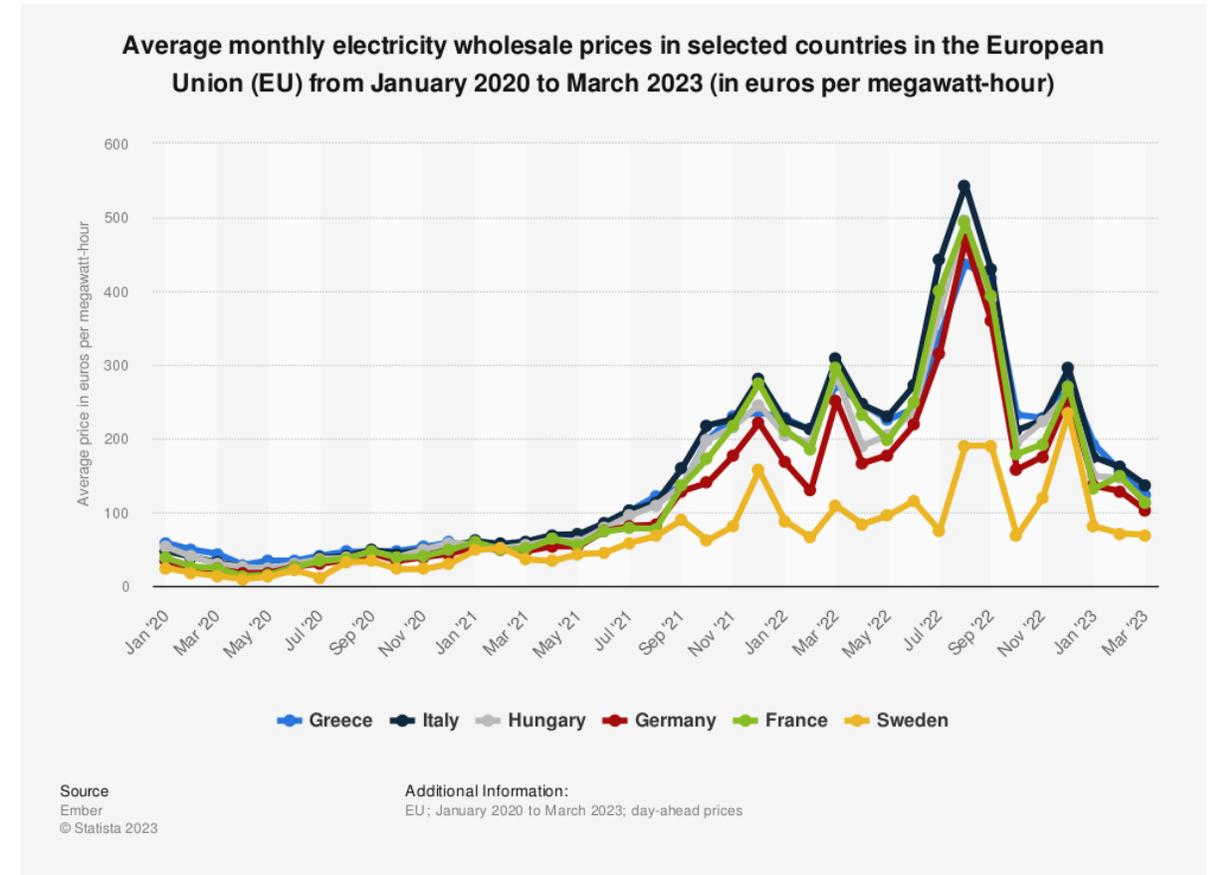


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European Energy crisis

- Physical supply was managed: no black-outs
- Efficient short-term dispatch
- Economic energy crisis ($\uparrow\pi$)
- Consumers were hit by record high prices
- Financial problems for retailers
- Unexpected revenues for generators





Electricity market performance

- Short term signals (wholesale)
 - Promoted system efficiency
 - Need of more flexibility
- Consumers were not protected
 - Need to allow consumers to hedge risk
 - Promote electrification
- Need to ensure investment
 - Failure to send long-term investment signals
 - Speed up vRES penetration at lowest cost



EU market reform

- Protect consumers from volatile energy prices
 - Hedging opportunities
 - Emergency mechanism, cap prices
- Stability and predictability of energy prices
- Promoting investments in renewable energy by de-risking it
 - CfDs
 - PPAs
- Stimulate non-fossil flexibility with capacity mechanisms



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Proposal for a

REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

amending Regulations (EU) 2019/943 and (EU) 2019/942 as well as Directives (EU) 2018/2001 and (EU) 2019/944 to improve the Union's electricity market design



TradeRES market design topics

- Wholesale market design
- Transmission networks
- Retail markets
- System adequacy
- De-risking investment in vRES
- Ancillary services



Wholesale market design

- Shorter lead times between market closure and delivery time;
- The implementation of a rolling time-horizon market clearing process;
- Trade shorter time units, e.g., of 30, 15 or 5 minutes ;
- The organization of the intraday market

Auction > Day-Ahead > 60min > NL > 27 June 2023

Last update: 26 June 2023 (12:46:56 CET/CEST)

Time Range Day ▾

Show Baseload

Show Peakload

Price



MCV Volume

Total: 83,879.7 MWh



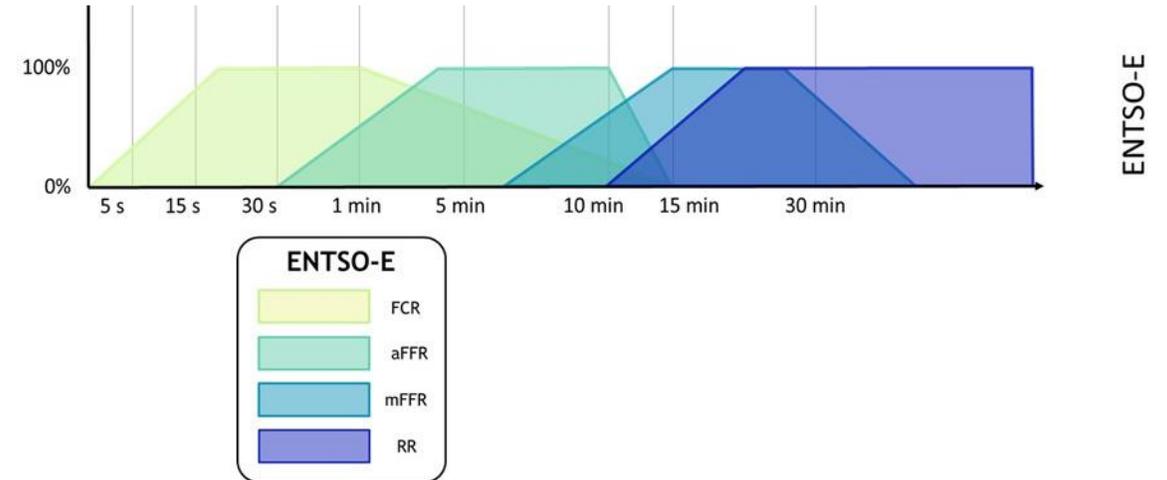
Retail markets

- Design of network tariffs + energy prices
- Capacity subscription
- Real time signals
- Role of retailers and aggregators in enhancing flexibility



Ancillary services

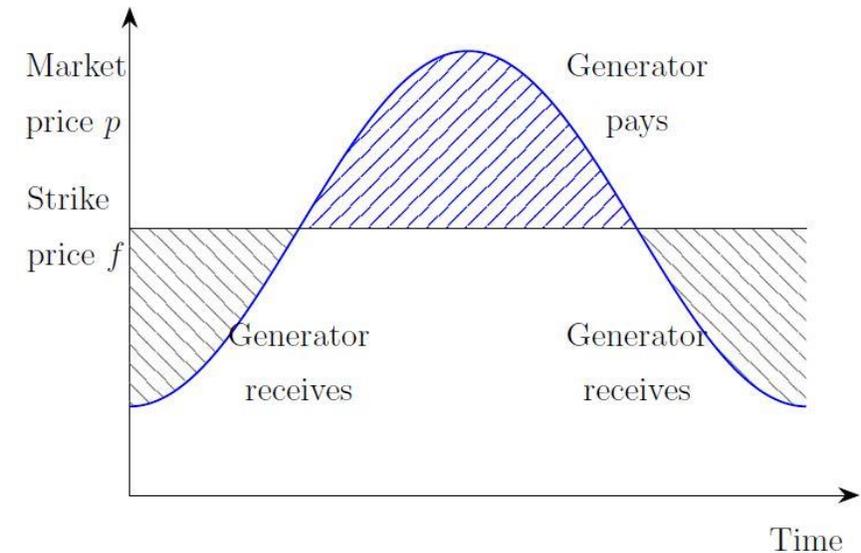
- Reformed to allow new resources
 - vRES
 - Storage
 - Demand response
- Critical changes
 - Smaller minimum bid sizes
 - Aggregation of resources
 - Asymmetrical bids
 - Passive balancing
 - Introduction of flexible ramping products
 - Introduction of fast frequency response
 - Procurement of inertia by TSOs





De-risking investments in vRES

- Two-way CfDs
 - Price certainty
 - Auctioning contracts
 - Potential risk of suboptimal dispatch
 - Design parameters as Financial CfDs
- Power Purchase Agreements (PPAs)
 - Hedge for short-term volatility to consumers
 - Confidentiality might result in a reduction of the competition among vRES
 - PPAs by themselves they are not able to motivate the needed investment in vRES





System adequacy

- Uncertainties associated to investment
 - Weather variations (hourly but also yearly)
 - Technology risks
 - Import supply shocks
 - Network development
 - Consumer strategies for decarbonization
 - Transition policy
- Solutions:
 - Reliability options,
 - Capacity subscription,
 - A combination?

Conclusions

- Energy crisis was mainly economic
- Current electricity market is not fit for the transition
 - Too much risk for vRES, firm capacity and for consumers.
- Future market design:
 - Short-terms markets for efficient dispatch
 - De-risking investment in vRES (CfDs)
 - Reliability options + capacity subscription to hedge consumers



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**Thank you for your
attention**