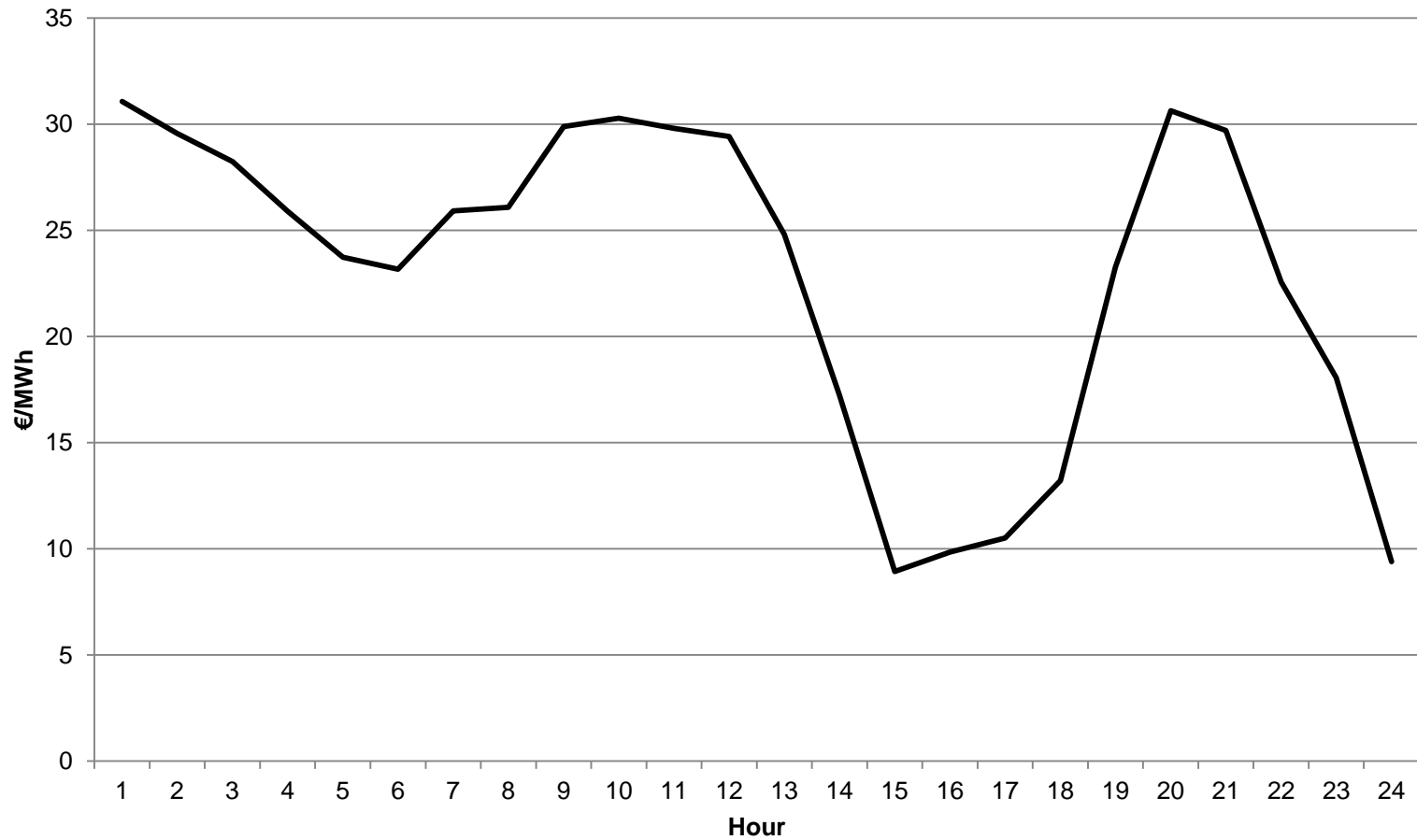


# Market Design to Incentivise Flexibility

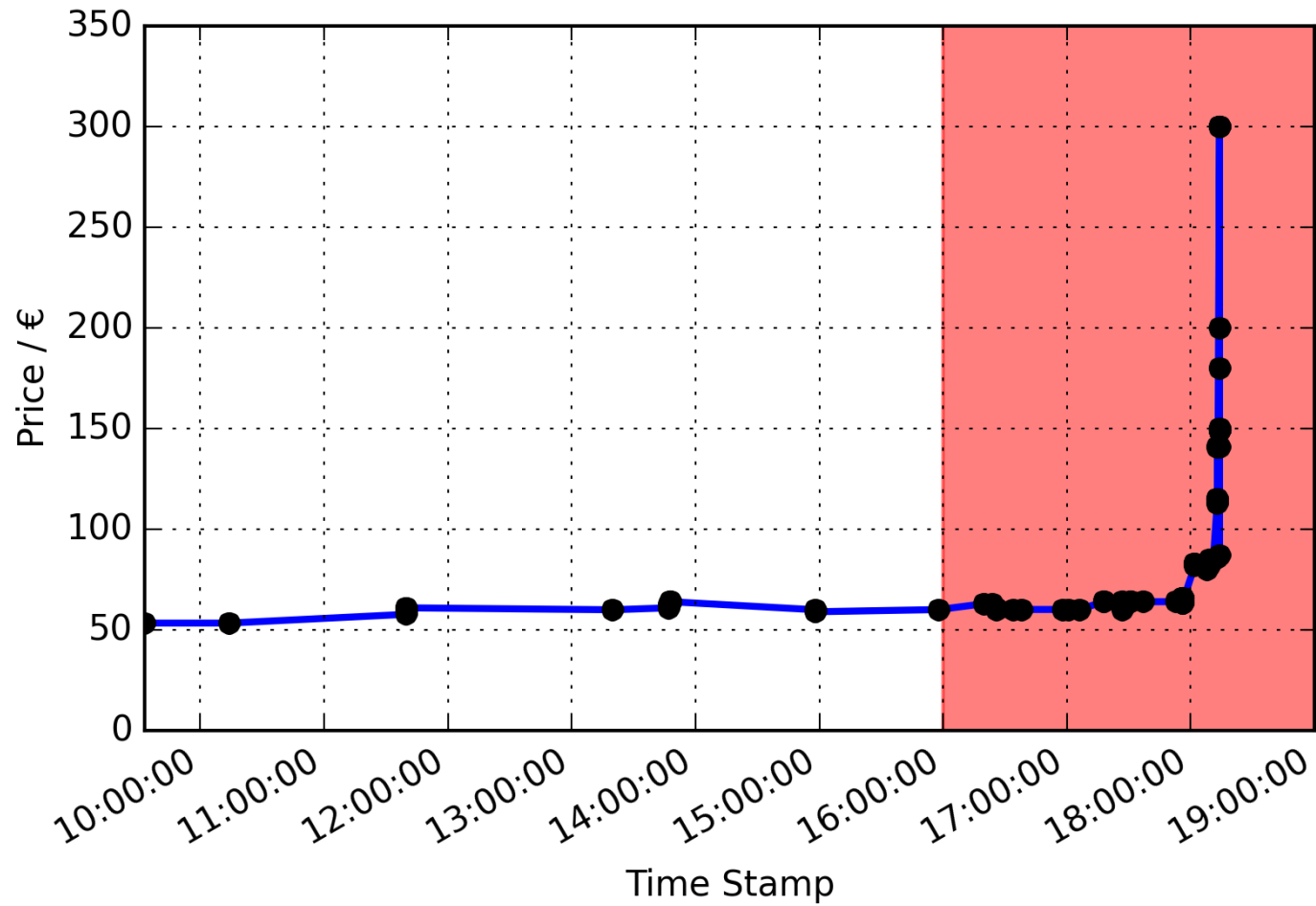
Dr. Maximilian Rinck – European Power Derivatives



# Dispatch Flexibility



# Temporal Flexibility



# Signatures of Flexibility in the Markets

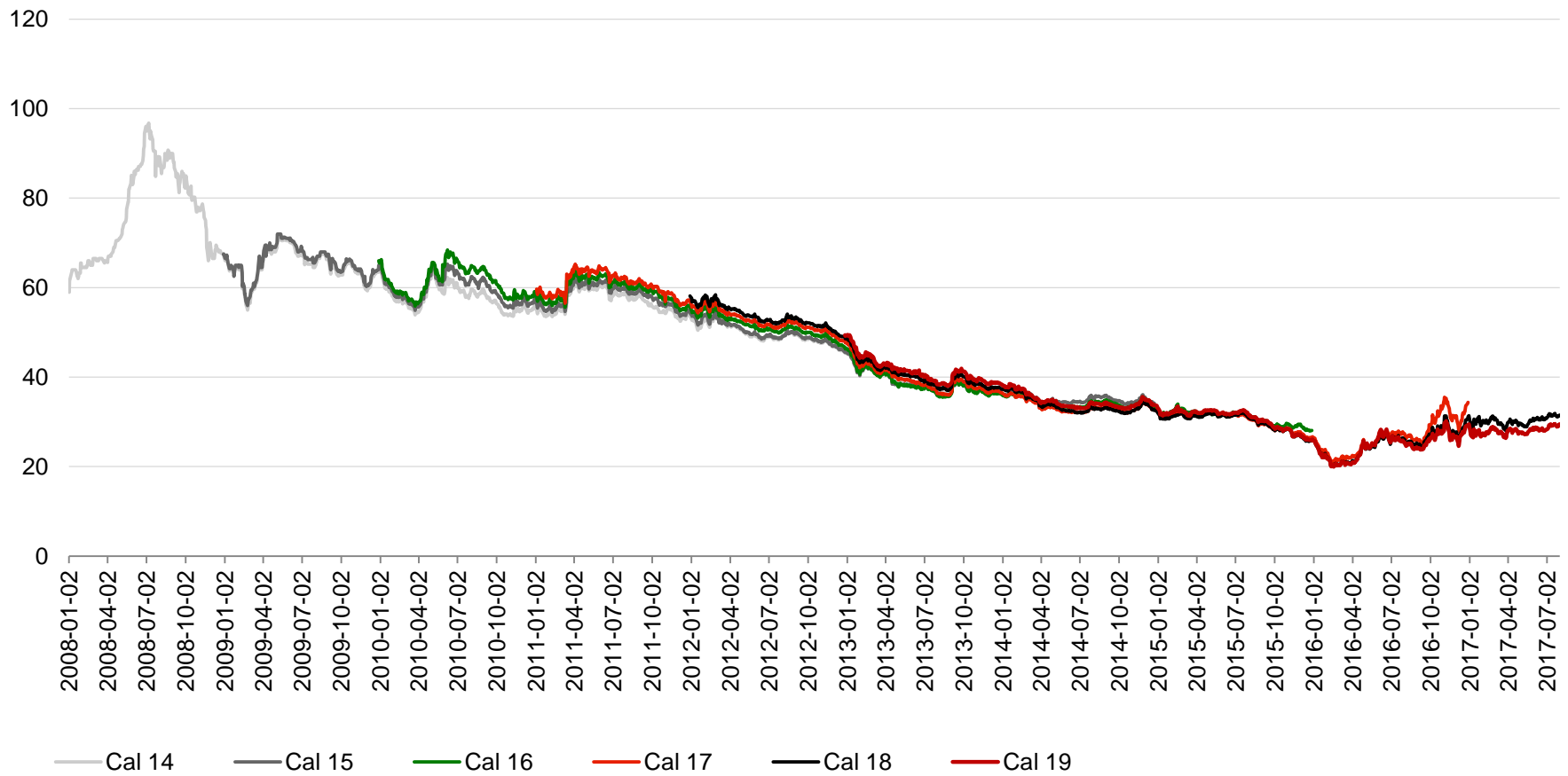
The presence of certain phenomena in power markets indicates a requirement for flexibility, whereas their absence in places where they are expected can be interpreted as the successful lifting of flexibility potentials – will there be an equilibrium?

- scarcity/surplus prices and significant spreads between different products
- arbitrage opportunities, e.g. Day-Ahead vs. Intraday
- short-term trading volume and volatility
- prices/volumes in imbalance markets
- intervention by grid operator and planned grid extension measures

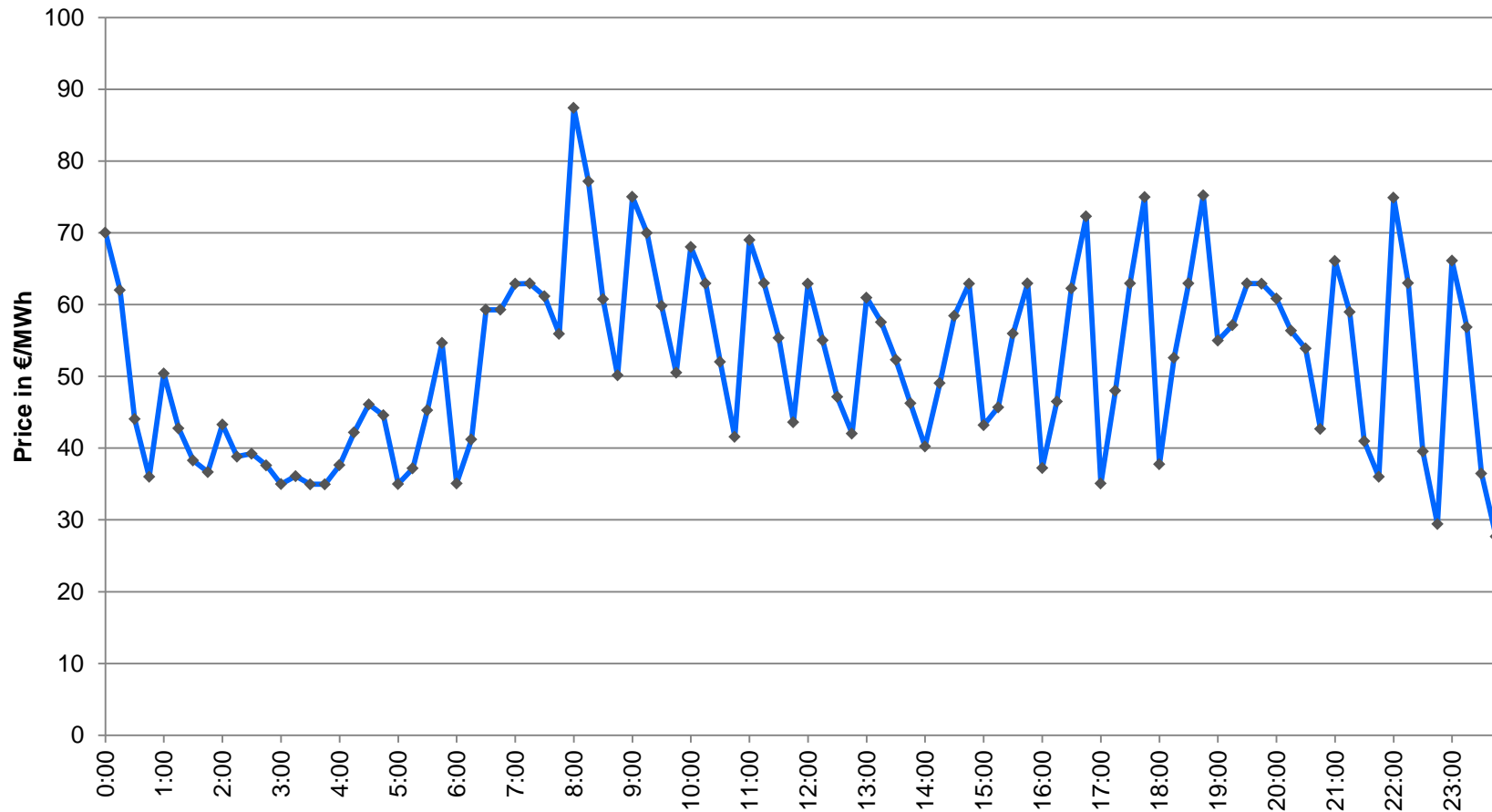
Here, we focus on price signals and how to make these tradable.

# The Classical Long-Term Price Signal

EUR/MWh



# Complex Price Signals on Short-Term Markets



# Initiatives to Provide Markets and Products for Flexibility

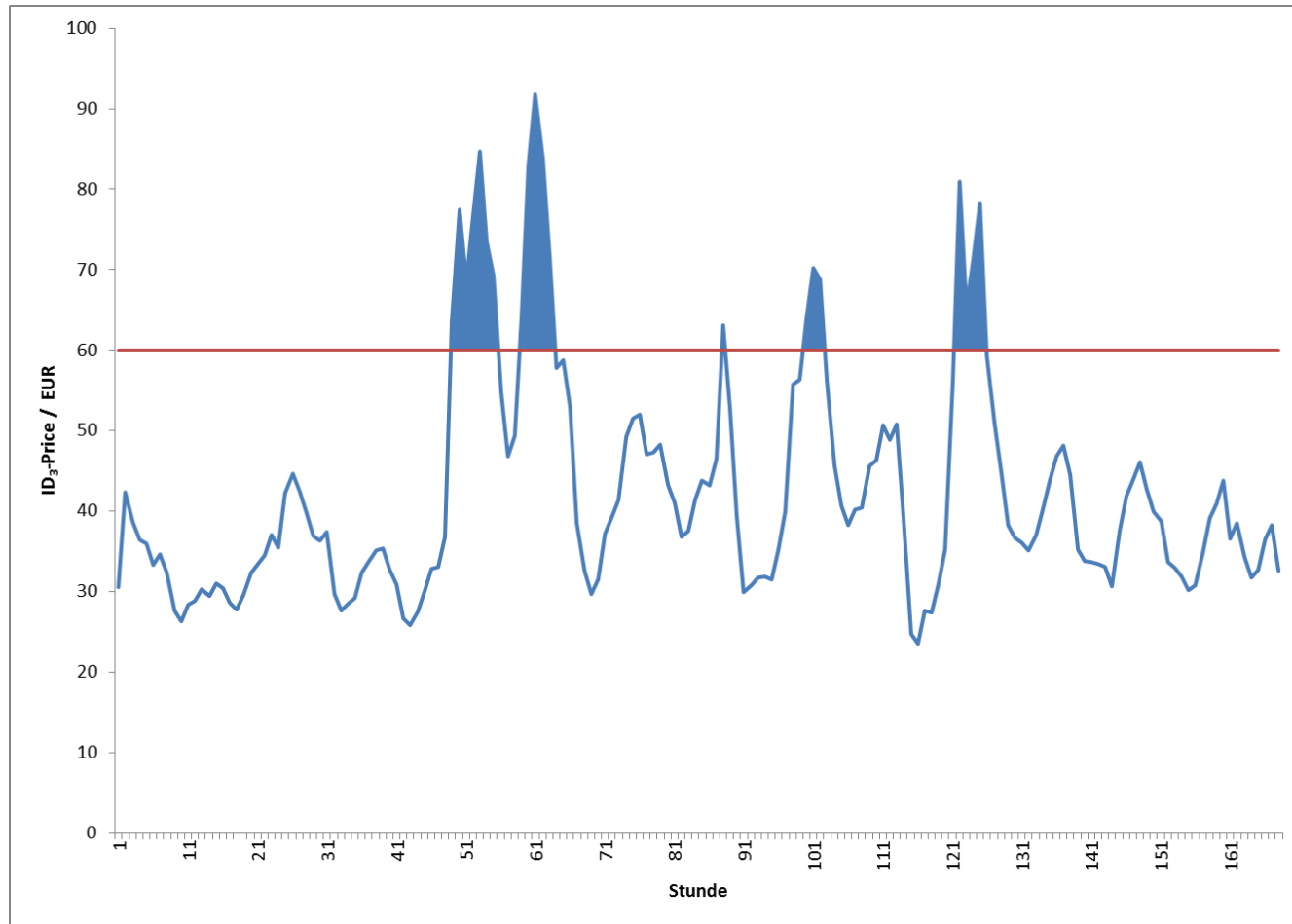
## Price Signals

EEX and EPEX have designed and implemented the ID<sub>3</sub>-Price for the German Intraday market. The ID<sub>3</sub>-Price of each (quarter)hourly product is the volume-weighted average of all trades up to three hours before delivery of that products. The index thus captures the temporal requirement or availability of flexibility by reflecting scarcity or surplus situations.

## Products

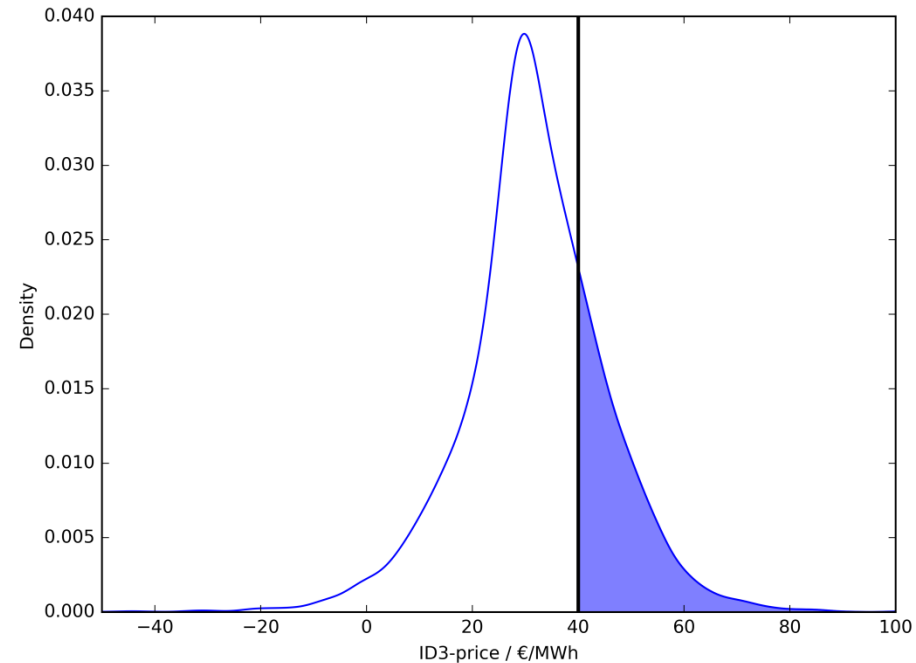
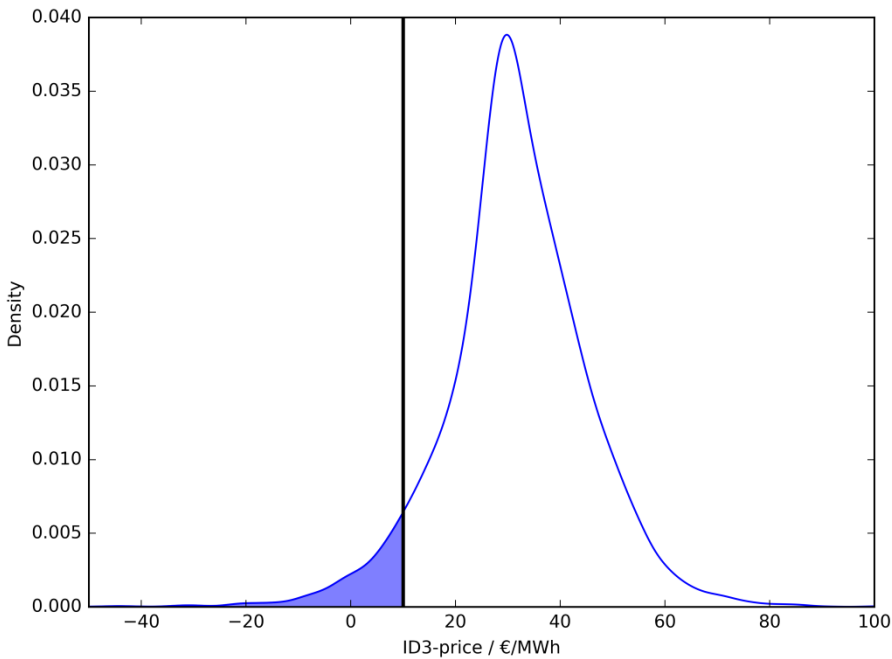
EEX has introduced the German Intraday Cap/Floor Futures to make the ID<sub>3</sub>-Price tradable up to four weeks ahead. In particular, the derivatives do not capture simple averages (conventional price signals), but the tails of the intraday price distribution.

# German Intraday Cap/Floor Futures





# German Intraday Cap/Floor Futures



Cap/Floor Futures are cash-settled derivatives on the ID<sub>3</sub>-price of the German Intraday market. The futures cover the high-price (cap) or the low-price (floor) segment.

# Flexibility in Regional Markets

- Flexibility also has a regional component, e.g. storages located in areas with overproduction of wind power.
- This is currently not reflected in the price signal, which, due to the zonal market design, is ignorant of location.
- Designing smart regional markets is a challenge on its own, cf. Smart-Markets-Study by Agora Energiewende.
- Important aspects:
  - No interference with established markets/price signals like Day-Ahead and long-term derivatives
  - Several design options for regional markets possible and dependent on regional characteristics, cf. Agora-study
  - Proper design of mechanisms for proof of delivery, separate or included in current BRP-mechanism?



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Thank you!

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