

Market Code Consultation WS 4

Intraday and Balancing markets
Some key aspects and design choices



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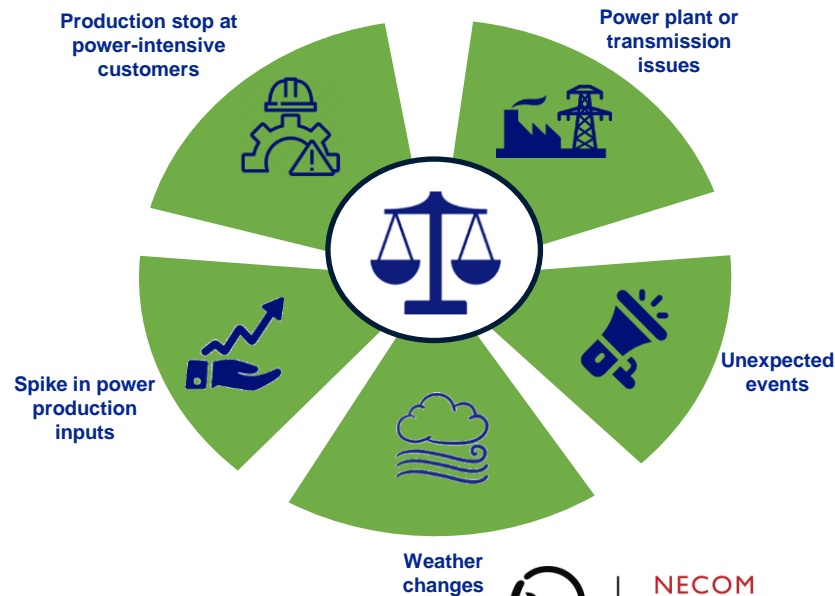
The intraday market allows for adjustments to actual conditions

Introduction to the intraday market

- Allowing consumers and producers to buy and sell 24/7/365
- Caters to differences between prognoses from the previous day and real-world conditions, providing balancing opportunities
- Important for participants to match traded and actual volumes produced/consumed in order to avoid imbalance fees imposed by the TSOs
- Hourly contracts with physical delivery – gate closures depends on products definitions

Why do we need an intraday market?

Several factors affect the supply and demand balance, requiring real-time adjustments



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Intraday-markets – two different market models exists

Auction-based model

- Buyers and sellers need to submit their bids and offers before a specific time – gate closure.
- All bids and offers are cleared at the same time.
- Market price is set at the interception between the seller's willingness to produce and the buyer's willingness to consume.
- The Market price algorithm determines marginal price for a defined market area.
- Buyer who were willing to pay the marginal price or more will be successful (\leq bid price).
- Seller who were willing to sell at the marginal price will be successful (\geq offer price).

Continuous trading

- Sellers and buyers can submit order up and until the interval closed for trading.
- Trades are concluded on a continuous basis when the buyer is willing to pay the sellers price AND transmission capacity is available to deliver the order.
- Trades are normally concluded at the **seller's price**.



Intraday-markets – What are the pro´s and con´s?

Auction-based model

- Gather liquidity
- Auction closer to delivery
- Easy to reposition after day ahead auction
- Capture renewable production and flexible consumption
- Easier to access intraday for smaller players
- Will provide a value/cost of congestion

Continuous trading

- Trades are concluded on a continuous basis when the buyer is willing to pay the sellers price AND transmission capacity is available to deliver the order.
- Will allow a market participant to manage its imbalances at the time it occurs
- “What you see is what you get” – easy to understand
- ... but as it is based on “first come, first served, it might not be the “right” trade”.



What is Electricity Balancing?

Balancing is an integral part of a good energy market.

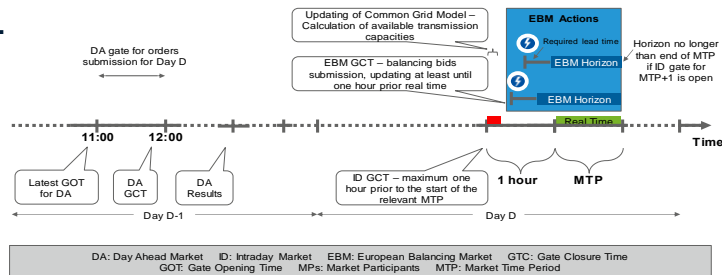
Processes related to balancing create operational responsibility based on two pillars:

Balance management

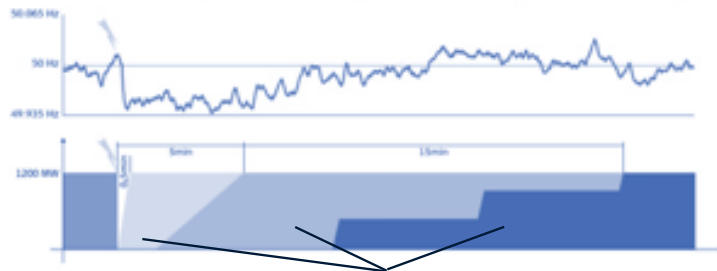
- A balancing mechanism focussing on the **market participants'** requirements and capabilities to balance own portfolios and consequently assume balance responsibility towards TSOs

Balancing processes

- **TSO's** direct responsibilities in managing the system's residual balance through implementing EU best-practice processes regarding the procurement and activation of balancing services



Balancing is the most time-critical part of the energy market



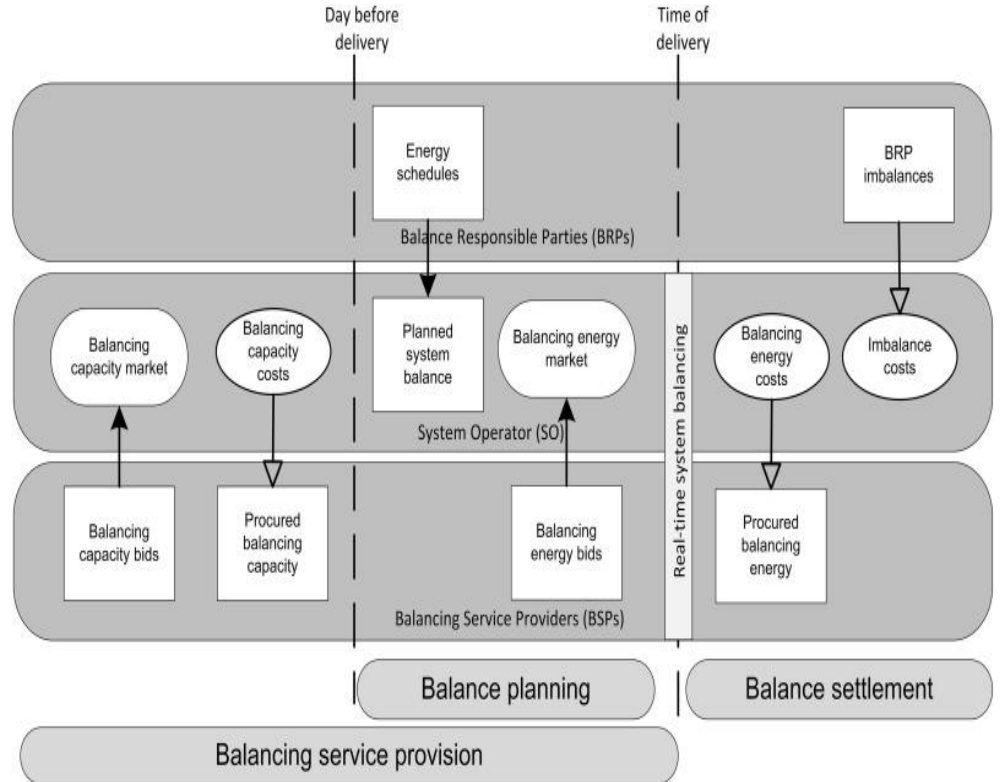
Load-frequency control through activation of different types of reserves / balancing products after an incident



Some important clarifications

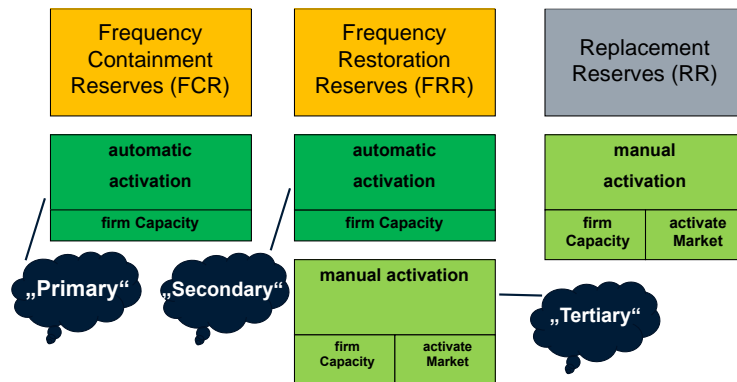
Distinction between procurement of balancing energy and reserves:

- Balancing energy is procured in the Balancing Market and imbalances are settled at the imbalance settlement price.
- Reserves are capacity (availability) products procured through auctions at different time scales (including daily) and they are paid (usually) as-bid.



Balancing products

- Frequency Containment Reserve (FCR) – this is what in some system is referred to as “Primary reserves”
- Automatic Frequency Restoration Reserve (aFRR) – this is what in some system is referred to as “Secondary reserves”
- Manual Frequency Restoration Reserve (mFRR) – this is what in some system is referred to as “Secondary reserves”
- Replacement Reserves (RR) – this is what in some system is referred to as “Tertiary reserves”
- Emergency Reserves (ER)



Balancing Energy Price

	Positive balancing energy price	Negative balancing energy price
Upward regulation	TSO pays BSP	BSP pays TSO
Downward regulation	BSP pays TSO	TSO pays BSP



One-price system

TSOs system state	BRP Imbalance		
	short (-)	neutral (0)	long (+)
Neutral (0)	Reference price payed from BRP to TSO	0	Reference price payed from TSO to BRP
Short (-)	Imbalance Price payed from BRP to TSO	0	Imbalance Price payed from TSO to BRP
Long (+)	Imbalance Price payed from TSO to BRP	0	Imbalance Price payed from BRP to TSO

Table 1: Payment for BRP imbalance in a One-Price System



Two-price system

TSOs system state

BRP Imbalance

	short (-)	neutral (0)	long (+)
Neutral (0)	Reference price payed from BRP to TSO	0	Reference price payed from TSO to BRP
Short (-)	Imbalance Price payed from BRP to TSO	0	Reference Price payed from TSO to BRP
Long (+)	Reference Price payed from TSO to BRP	0	Imbalance price payed from BRP to TSO

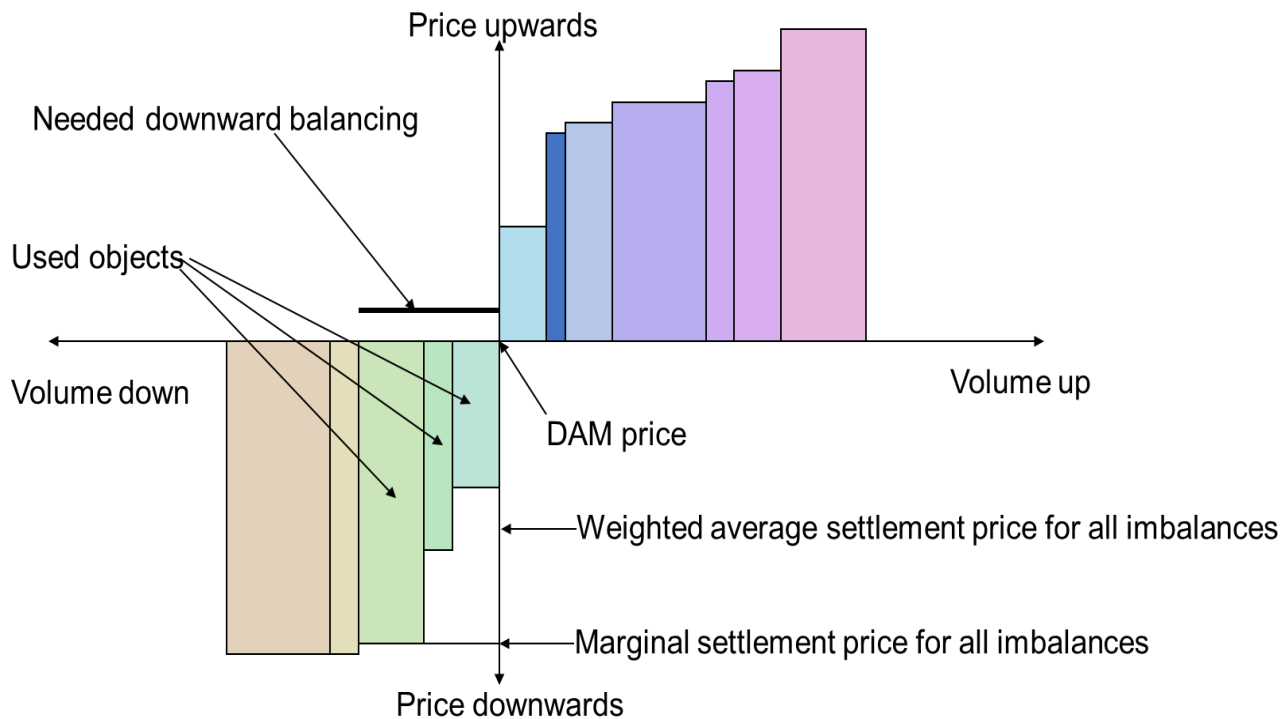
Table 1: Payment for BRP imbalance in a Two-Price System



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Imbalance Pricing principles – use DAM price as vertical limit

Question – Marginal price or Weighted average?



THANK YOU
FOR YOUR ATTENTION!

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