FLOW-BASED MARKET COUPLING IN THE NORDICS

Benefits and challenges

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FLOW-BASED
A METHOD FOR REPRESENTING THE PHYSICAL GRID AS MARKET CONSTRAINTS.
FLOW-BASED IMPROVES THE UTILIZATION OF THE GRID.
NET TRANSFER CAPACITY (NTC)

- Represents the capacity between two bidding zones.
- Simple representation of the physical grid.
- Split of capacity between borders is decided by the TSOs → No transparency.
- 36 constraints delivered to the market coupling every hour in the Nordics.

FLOW-BASED (FB)

- Represents the capacity available for all relevant elements in the grid.
- More accurate representation of the physical grid → Increased complexity.
- Split of capacity is driven by the market at the time of allocation.
- Around 150 constraints delivered to the market coupling every hour in the Nordics.
FLOW-BASED GO-LIVE IN Q1 2024

“The Nordic NRAs find that the Nordic TSOs in the external parallel runs (EPR) report have demonstrated that the flow-based (FB) capacity calculation works sufficient in operational terms, given the current state of development.”

NordREG communication from the 12th July

The next phase is the final 6 month of external parallel run before go-live.
EXTERNAL PARALLEL RUN RESULTS

The external parallel run has produced simulated market results with capacities from the Nordic flow-based.

- Test environment for market algorithm used for simulations.
- Input data identical to day-ahead market coupling input.
  - Except capacities in capacity calculation region Nordic and Hansa.
- Output data and optimization on hourly level as today.

All data are available on the Nordic RCC website.
SIMULATED FB RESULTS COMPARED TO DAY-AHEAD MARKET COUPLING RESULTS
Flow-based impact January-July 2023

- Total net export from the Nordic area increased by 5%
- Social economic welfare in Europe increased by MEUR 184
- NO2 net export decreased by 68%
- NO4 net export increased by 15%
- Average price of a MWh in the Nordic area increased by 4-6%
THE IMPACT OF FLOW-BASED IS VERY DIFFERENT FROM BIDDING ZONE TO BIDDING ZONE

Flow-based impact January-July 2023

Similar changes in volume do not have the same price impact.

Change in Buy and Sell volumes compared to price change per bidding zone

[Diagram showing changes in Buy and Sell volumes compared to price change per bidding zone]
INCREMENT IN FLOW THROUGH THE NORDIC GRID

Changes in average prices in the Nordic area from January to July, comparing flow-based to the actual market coupling results.
INCREASED USE OF FENNO-SKAN

The capacities available on the interconnector Fenno-Skan (FI->SE3) are limited in the market coupling today, but with flow-based the utilization of the interconnector.
ARE YOU READY FOR FLOW-BASED?
More information?

- Flow-based capacity calculation results: https://test-publicationtool.jao.eu/nordic

- Market reports, phenomenon report, ID gate opening results, and other relevant EPR data: https://nordic-rcc.net/flow-based/simulation-results/
