N-SIDE

Redefining flexibility management:
How to meet all needs with
System Operators coordination

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While multiple markets have emerged in the power sector during the last decades, from year-ahead capacity markets to real-time balancing platforms, local flexibility markets are the missing link. Efficient coordination will have to be put in place between the system operators and flexibility providers to ensure the efficient use of the flexibility.
In the end, the goal of the flexibility market is to have flexibility used at the right time, at the right place and by the right actors.

POLL #1   **What is the hottest topic in flex markets?**

11%	**67%**	**18%**	**4%**
Gaming	T&D Coordination	Liquidity	Societal cost

Among the hottest topics in flexibility markets, T&D coordination seems to have the highest importance, as reported by 2/3 of the votes. On the main challenges related to the implementation of local markets that still need to be solved are Liquidity and Gaming: they have been ranked in 2nd and 3rd position.

POLL #2   **Which Coordination model fits the most of your organization's needs?**

23%	**32%**	**35%**	**10%**
Local Market	Common Market	Integrated Market	Other

The results of the poll illustrates perfectly one of the key takeaways: the standard, one-size-fits-all Coordination model doesn't exist, it needs to be tailored.

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Coordinated use of flexibility resources between actors	FMO - FMO	DSO - TSO	DSO - TSO
Economical efficiency	Coordination/filtering of flexibility resources allows to extract the most of the flexible assets at the local level	- In the NO context with highly flexible hydro assets - Maximal liquidity - By design resolves existing congestions & avoids new ones	Welfare maximisation taking all needs and constraints of the DSO, TSO and flex sellers. Remaining flexibility which can be activated considering network limitations can be forwarded to other markets.
Institutional Simplicity	The approach was developed as a system operator tool running entirely on the DSO side. The approach can be adapted to different set-ups: DSO-tool, TSO-tool, 3rd party,...	- No changes required with mari EU balancing processes - Clar governance model	Compatible with alternative sources of flexibility for both DSO and TSO. Legal/regulatory context could remain a blocking point in some countries.
Technical Scalability	Approach likely to scale more by increasing the number of parallel markets	Computationally efficient and compatible with MARI	Aggregation of assets and the use of headrooms are keeping the complexity under control

- ✅ Nowadays, no one size fits all solution: the right model is the result of technical, organisational & design choices...

- ✅ ...but auction-based coordinated flexibility markets are already a reality & allow to reach the best efficiency

- ✅ We have to strike a balance between the need to adapt to the current context & develop future proof solutions...

- ✅ ... and work on the remaining open challenges such as gaming or liquidity maximisation

Q&A

Q1: With respect to the multi-level market, is this bottom-up information sharing from DSO to TSO?

A1: *It is at the bottom in the sense that it starts from the lowest level and goes up to the higher level. The key point is we only share the minimum information. We take the bid from the BSP, we take the grid constraints, we blend them into what is feasible in your grid. You gave that to the higher level without sharing unnecessary information and letting the upstream level have access to information that they strictly need.*

Q2: In what timeframe is the congestion/overload predicted? Is it based on dynamic condition or static calculation?

A2: *The congestion is observed in a dynamic way close to real time (very specific to Nordic countries based on Hydro generation so congestion can be resolved in a close timeframe) currently they are doing it on a manual basis. The game changer are the platform where the process of activating bids has to become much more automated and that's really the driver of the needs here. They do have massive intra-zonal congestion and they do have to resolve it in a more structured and automated way.*

Q3: What kind of optimization tool is used here?

A3: *In the Cornwall LEM what we are solving is the MIQP problem. We use optimisation solver (IBM CPLEX) which branch and bounds algorithms have been customised with cuts to reach optimality.*

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