"The time for flexibility is now" -
Testing a local flexibility market
in the Energy-Flexible Model Region Augsburg

The rapid expansion of renewable energies in Germany, essential for the energy transition, is increasingly causing regional imbalances in electricity generation and demand due to the slower grid expansion, necessitating massive redispatch measures to manage grid congestions. Those measures include curtailing renewable energies in the North and ramping up conventional power plants in the South of Germany. According to the Federal Network Agency (BNetzA), the associated costs amounted to around 3.1 billion euros in 2023 alone.

Despite the planned expansion of the electricity grid, an **increasing need for redispatch is expected** in the coming years. Various solutions are currently being discussed concerning the future handling of grid bottlenecks. One approach, which has already been discussed intensively and controversially in the past, is **introducing local price signals through a locally differentiated electricity market design**. This could theoretically be realised by dividing the German-Luxembourg electricity bidding zone into several zones or by introducing nodal pricing. However, a recent study carried out as part of the Kopernikus project SynErgie indicates that **various bidding zone configurations yield only minimal reductions in redispatch costs** and demonstrate instability **over time**. Therefore, a division of the uniform German price zone is justifiably controversial. According to this study, implementing nodal pricing would result in significantly lower redispatch and overall electricity generation costs. However, studies run by the European Commission's Joint Research Centre in the scope of the Electricity Market Design reform have highlighted challenges associated with this market design within the European Union, for example, regarding transition costs and required institutional changes. Therefore, if these two market design alternatives are ruled out and the single price zone in its current form becomes increasingly inefficient, then it should be **complemented by local flexibility markets**.

A local flexibility market is a marketplace designed specifically to procure flexibility within a geographically defined area with the aim of managing congestion at a local level. Local flexibility markets can help to manage flexibility in a targeted manner or incentivise it precisely where and when it is needed to reduce grid bottlenecks. In our opinion, local flexibility markets, therefore, offer a decisive advantage - especially in view of the current discussions: **local flexibility markets represent an interesting opportunity to introduce the urgently needed local price signals while maintaining the single German bidding zone**. These local flexibility markets are in line with the electricity market paper just published by the Federal Ministry for Economic Affairs and Climate Action (BMWK) , in which the BMWK commits to maintaining the single German-Luxembourg bidding zone while also emphasizing the need to complement the current electricity market design with a local dimension.

Local flexibility markets are not a new concept: in some neighbouring European countries, such as the Netherlands or the UK, these markets have been established for years. **Kora Töpfer, Head of German Public & Regulatory Affairs at EPEX SPOT**, says: **"The concept of local flexibility markets has proven to be sound both in theory and in practice:** Redispatch costs have been demonstrably reduced and load-side flexibility has been efficiently integrated into the electricity system. Commercial applications of local flexibility markets in the Netherlands and the UK show that such markets make it possible to significantly increase the potential of load-side flexibility with relatively little implementation effort. The energy sector has the task of utilising batteries, demand-side response, power-to-X and all types of flexibility in a grid-friendly manner in order to make the energy transition cost-efficient."

In Germany, however, local flexibility markets currently play hardly any role in discussions about the further development of the electricity market design. This is mainly due to the fact that the emergence of market power and the so-called "inc-dec gaming", i.e., strategic bidding behaviour, represent fundamental challenges that need to be addressed and resolved when implementing local flexibility markets. However, as the successfully implemented examples from neighbouring European countries indicate, these theoretical challenges can also be managed in practice through suitable market designs and targeted monitoring, among other measures.

Numerous measures can significantly restrict strategic bidding behaviour:

- The diversification of flexibility models (hybrid models) influences the conditions of strategic bidding.
- The combination of short-term and long-term flexibility procurement in the local flexibility market makes gaming riskier and, therefore, unlikely in practice.
- Competition among market participants limits profit opportunities from strategic bidding - this also applies to sequential markets, which include flexibility markets.
- Last but not least, gaming can also be sanctioned by market rules. So-called baseline verification procedures enable market operators, such as EPEX SPOT, to monitor compliance with market rules.

Once the benefits of additional flexibility outweigh the drawbacks of possible strategic behaviour, a gain for the end consumer is achieved. Together with EPEX SPOT, the **Kopernikus project SynErgie therefore advocates considering and evaluating local flexibility markets.**

To address current reservations about local flexibility markets and to develop, test, and transfer targeted measures for monitoring market power and gaming, **regulatory learning in the context of model regions and regulatory sandboxes** plays a central role. The **legislation for regulatory sandboxes** initiated by the BMWK provides, for example, the basis for **implementing a local flexibility market, such as in the** Energy-Flexible Model Region Augsburg.

With 26 partner companies, 11 research institutions, 16 transferable demonstrators, and the systematic networking of all relevant stakeholders such as policymaker, grid operators, industry, and society, the Energy-Flexible Model Region Augsburg offers ideal conditions for implementing this regulatory learning with the help of experimentation clauses. At the same time, as a region with a high level of fluctuating electricity generation and significant industrial electricity consumption, the Energy-Flexible Model Region Augsburg is **excellently transferable to other regions** in Germany, which represent the **industrial core of the country** and are therefore of **central importance to Germany and Europe**. In addition, the work carried out as part of the Kopernikus project SynErgie has already provided extensive and precious experience in the conceptual design, prototype realisation, and initial test operation of continuous energy flexibility trading.

Broad support for the introduction and testing of a local flexibility market in the **Energy-Flexible Model Region Augsburg** is also found at the state level - as a recent press release from the Bavarian Minister of Digitalisation makes clear, in which the region of Bavarian Swabia and the Energy-Flexible Model Region Augsburg are described as role models for the whole of Germany.

Prof. Dr. Dr. h.c. Hans Ulrich Buhl, who leads the flexibility marketing strand and the Energy-Flexible Model Region Augsburg as part of the Kopernikus project SynErgie, says: "The Kopernikus project SynErgie with the Energy-Flexible Model Region Augsburg offers ideal conditions for testing local flexibility markets as part of a

regulatory sandbox and thus enabling regulatory learning. The results achieved can provide important insights for the electricity market across Germany, particularly regarding the current discussions."

Concluding statement by EPEX SPOT and the Kopernikus project SynErgie:

- All parties involved are ready for a local flexibility market in the Energy-Flexible Model Region Augsburg - companies, research, the power exchange, and local politics. However, we also need the willingness of federal policymakers (in particular, the BMWK) and the regulatory authority (BNetzA) to realise a corresponding initiative and to derive insights applicable to the entire country.
- As part of a joint initiative, EPEX SPOT and the Kopernikus project SynErgie declare their willingness to participate intensively in regulatory learning in the area of local flexibility markets. In the Energy-Flexible Model Region Augsburg, this will be tested in practice through cooperation between local companies, research institutes, the power exchange, local grid operators, and policymakers.