Solving Capacity Constraints Through Grid Digitalisation: Insights from Norwegian DSOs

On **June 17th**, GEODE members **Elvia** and **Glitre Nett** hosted the **WG Innovation & Development meeting** in **Oslo**, offering participants unique insights into Norway's electricity system and the innovative approaches DSOs are developing to meet growing challenges.

Elvia, which serves around **one million customers** in South-East Norway, operates in a country heavily reliant on hydropower, complemented by wind generation. With 75% of capacity controllable thanks to hydropower reservoirs, the system provides significant controllability, though **rapid growth in demand** from data centres and solar parks is **stretching grid capacity**. To address this, Elvia is pursuing a strategy to **identify and unlock 20% more capacity** within existing grid infrastructure.

The company has also launched a **pilot programme to optimise network use** through digital grid information, flexibility agreements, and local flexibility markets. As part of this initiative, Elvia **engages proactively with prospective customers** to explain grid requirements and coordinate on flexibility and solar integration, with initial efforts targeting those already in the connection queue. In parallel, Elvia is developing a **research and development project on local flexibility markets**, expected to reach maturity by **2026**. Beyond this, Elvia maintains a broad **R&D portfolio** with around **33 active projects** each year in the field of **grid operation**. Flagship initiatives include the use of drones as a cost-effective alternative to helicopters for infrastructure inspections, as well as work on self-healing grids and ways to optimise capacity use during off-peak periods to accommodate growing demand.

Glitre Nett, Norway's second largest utility company, serves around **320,000 customers and** operates **30,000 km** of **power lines**. To prepare for potential failures in a system increasingly reliant on imported electricity, wind, and solar, the company is developing a **new system to analyse grid bottlenecks** and assess whether relay protection systems can function effectively under different failure scenarios. At the same time, **electricity consumption** is steadily **rising**, with data centres expected to become major consumers by 2050. As **grids struggle to keep pace** with this demand, better use of existing infrastructure is essential. Solutions include the deployment of batteries, cross-sector coupling, and the use of **capacity maps**. **All Norwegian DSOs are now required to publish such maps**, and **Glitre Nett has developed its own**, aimed primarily at large customers (1 MW or more), available **here**.

Glitre Nett is also championing **data-driven grid analysis**. Optimisation, once reliant on individual expertise, is now supported by models and advanced analytics. The nationwide rollout of smart meters has enabled detailed monitoring, while new sensors and drones feed into a unified digital platform that provides actionable insights. Operators now have real-time visibility of the grid, supported by smart meters that send alerts before failures occur. Overall, **Glitre Nett is transforming into an analytical utility company** where research, innovation, and development play a crucial role, with an annual budget of 2,7 million Euro.

Together, **Elvia and Glitre Nett showcased how Norwegian DSOs are embracing digitalisation, flexibility, and data-driven innovation** to strengthen resilience, optimise networks, and prepare for an electrified future.