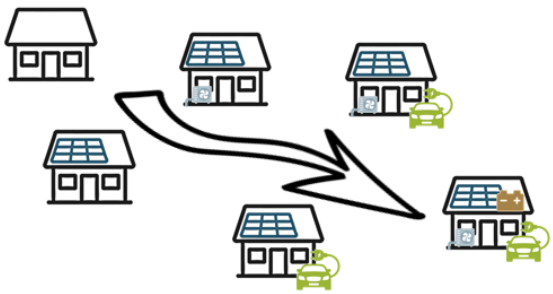
SUCCESS CASE 11.2024

Hexagon Analysis

INNOVATING GRID MANAGEMENT IN FLANDERS

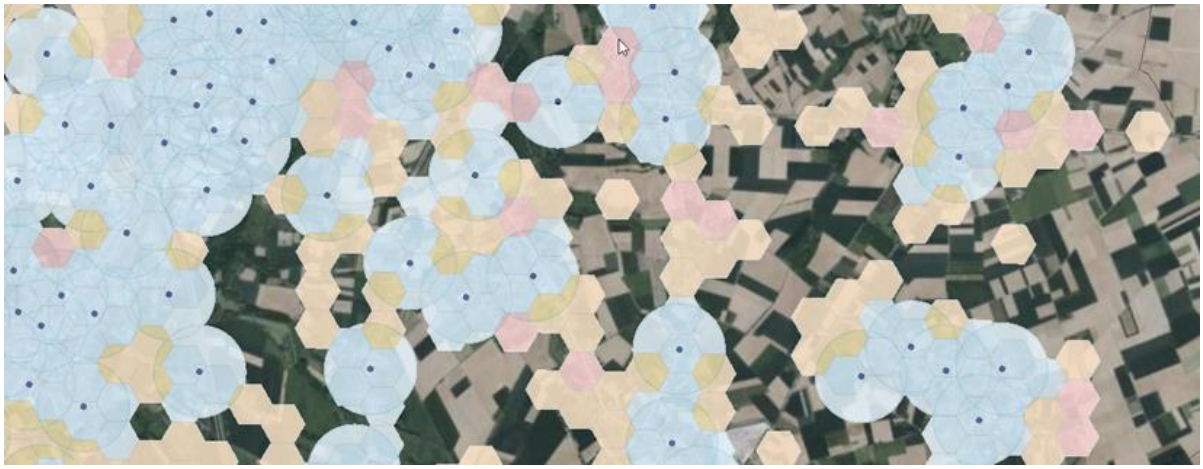
THE CHALLENGE



The increasing adoption of photovoltaic (PV) panels across Flanders has led to numerous voltage issues within the local electricity grid. The surge in localised energy production has significantly impacted grid stability, particularly in regions like Limburg (in the east of Flanders), where the coverage rate of solar PV installations is the highest and the average installation capacity is slightly larger than in other Flemish regions. In this context, the challenge was to **effectively manage voltage complaints** and **prepare the grid for future demand** driven by the ongoing energy transition.

THE SOLUTION

To address these challenges, Fluvius' Network Management and Network Operations teams



Example of the Hexagon-Grid and Substation-coverage.

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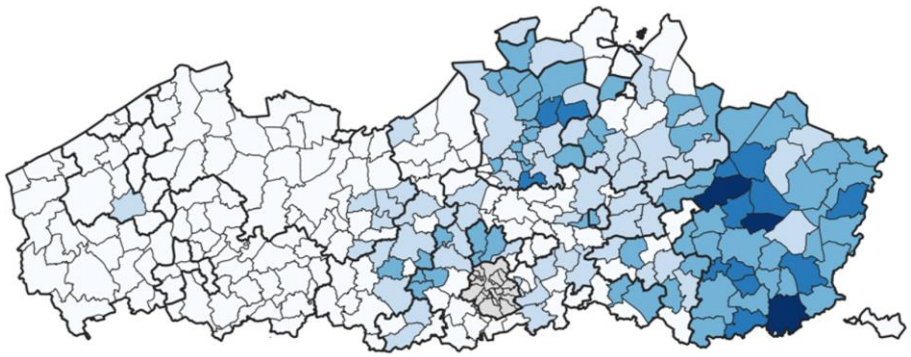
developed the **Hexagon Analysis tool**. This geospatial tool is an innovative solution that divides Flanders into hexagonal segments, each analysed alongside its six neighbouring hexagons. The tool incorporates vital parameters such as the distances between substations, the distance from customers to substations and their overlay (*see circles in the previous figure*), the proximity to medium voltage and the frequency of voltage complaints. The analysis is visualised through an additional layer in Fluvius existing Geoview platform, offering a clear overview of current and potentially problematic areas and suggesting appropriate solutions based on a colour-coded system.



Zones in need of increased substation density identified in Flanders.

MAIN ACHIEVEMENTS

The Hexagon Analysis tool has revolutionised the way Fluvius addresses grid issues:

- **Efficiency.** The tool allows for quick identification and solution of voltage problems, significantly reducing the time needed to locate and address issues.
- **Proactivity.** By predicting future grid needs, the tool enables proactive planning and investment, ensuring the grid remains robust and reliable amidst increasing electrification.
- **Visualisation.** The clear visualisation of problem areas and solutions simplifies decision-making processes for grid management teams.

KEY SUCCESS FACTORS

Several factors contributed to the successful rollout of the Hexagon Analysis tool:

- **Collaborative Development**. The tool was developed through close collaboration between the Network Management and Network Operations teams, combining field insights with technical expertise.
- **User-Friendly Interface.** The integration into the existing Geoview platform ensures that the tool is accessible and easy to use for all relevant stakeholders.

- **Field Testing**. Extensive testing was conducted in one of the Fluvius regions, Limburg South, which is heavily affected by voltage issues. This testing ensured the tool's effectiveness and allowed for refinements based on feedback from users in the operation teams.

WAY FORWARD

Moving forward, Fluvius plans to **scale up** the use of the Hexagon Analysis tool **across its entire network**. Continuous improvements will be made based on user feedback and emerging grid challenges. Additionally, **further integration with other grid management** systems is planned to enhance the tool's capabilities and provide even more comprehensive solutions for grid stability.

The Hexagon Analysis tool represents a significant step forward in grid management, demonstrating Fluvius' commitment to innovation and proactive planning in the context of the evolving energy landscape.