

SUCCESS CASE 7.2026

Flexband

AI AS AN ENABLER FOR \$14C
ENWG-COMPLIANT FLEXIBILITY
MANAGEMENT IN THE LOW-
VOLTAGE GRID



THE CHALLENGE

Grid operators face the challenge of preventing local grid congestion in the low-voltage grids caused by the growing number of flexible household loads and feed-in sources, such as heat pumps, battery storage systems and EV charging points. Without a smart control mechanism and flexibility management, this can lead to bottlenecks in the low-voltage grid, inefficient grid operation, more short-term interventions and inefficient grid expansion.

THE SOLUTION

The **flexband** is a preventive forecasting and control tool for the low-voltage grid. It defines the grid-compatible operating range of flexible household loads, storage systems and decentralized generators to avoid local congestion.

It consists of quarter-hourly lower and upper power limits, calculated proactively for the following day using grid topology, consumption behavior, weather data and AI-based utilization forecasts. Within this band, assets can operate in a customer- or market-optimized way while maintaining grid stability and enabling flexibility for market-based redispatch.



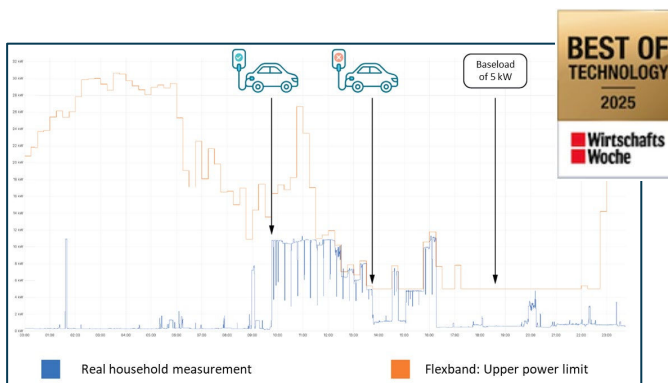
MAIN ACHIEVEMENTS AND BENEFITS

Flexbands enable a more proactive and efficient operation of the electricity grid. Congestion in the low-voltage grid can be identified early, allowing flexible assets to be controlled in a grid-friendly way within defined power limits.

For **DSOs**, this means better use of existing grid infrastructure, fewer short-term interventions, and more targeted grid expansion.

For **TSOs**, it creates predictable flexibility for market-based redispatch processes.

For **FSPs** (Flexibility Service Provider), the day-ahead information gives a greater planning security and reduces the risk that already marketed flexibility volumes must be curtailed.



- ✓ Concept validated in E2E customer tests
- ✓ Forecast: 43% MAE reduction versus baseline forecasts
- ✓ Awarded with “[best of technology award 2025](#)” (corporate inhouse solution)
- ✓ Basis for the [FNN VDE flexibility impulse paper](#)

KEY SUCCESS FACTORS

Adoption:

Flexibility bands require coordination between grid operators, customers, HEMS providers and market actors. Key challenges are unclear regulation, role definitions and customer acceptance.

Development:

The technology depends on accurate forecasts, reliable data and standardized interfaces. AI models, grid models and communication systems still need further development and secure integration.

Performance:

Performance depends on forecast quality. Limits that are too narrow restrict flexibility; limits that are too broad may not prevent congestion. The system must remain scalable and reliable.