

## SUCCESS CASE 15.2026

# Dynamic Grid Capacity Management



## DYNAMIC GRID CAPACITY MANAGEMENT THE CHALLENGE

The energy transition is leading to a massive increase in the number of decentralized generation assets in distribution grids, particularly wind power and photovoltaic systems. In many situations, the installed generation capacity significantly exceeds the coincident demand. As a result, weather-dependent short-term feed-in peaks as well as local and regional grid congestions are occurring with increasing frequency. At the same time, the requirements for grid operation are continuously increasing. Distribution System Operators (DSOs) must not only identify network constraints, but also manage them in real time and, in the future, forecast and optimize them through operational day-ahead planning processes. Conventional grid expansion alone cannot keep pace with the speed and dynamics of renewable energy integration.

The key challenge is therefore to maximize the utilization of available grid capacity while simultaneously enabling the targeted and grid-supportive use of the continuously growing number of flexible generation assets and, in the future, flexible consumption resources.

## THE SOLUTION

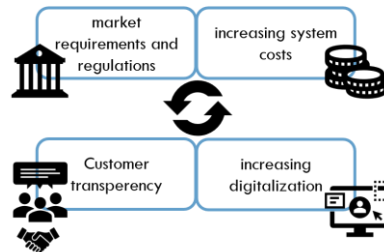
Through the combination of Dynamic Line Rating and Real-Time Infeed Management, Netz Niederösterreich has established a holistic approach to actively manage the growing integration of renewable generation and the resulting grid constraints. Dynamic Line Rating determines the actual available transmission capacity of high-voltage lines in real time based on weather data and conductor monitoring, thereby unlocking additional grid capacity that would remain unused under static ratings.

At the same time, the Real-Time Infeed Management System enables the monitoring, control, and coordinated activation of flexible generation assets and, in the future, also flexible loads and energy storage systems whenever operational measures are required. Together, both systems form the foundation for a future forecast-driven, day-ahead-oriented grid operation, where available network capacity and flexible resources are jointly optimized to ensure secure, efficient, and cost-effective system operation.



## MAIN ACHIEVEMENTS

- Increase a usable transmission capacity in the 110 kV network up to 40% by utilizing additional weather-dependent grid reserves
- Creation of a technical foundation for flexible grid access, congestion management, and future regulatory requirements
- Enables active and reactive power and voltage control include automated feed-in limitations
- Provides plant overviews, summaries per substation/feeder, and detailed event & alarm lists for operational transparency
- Supports operational measures and emergency actions, including dynamic selection of affected plants and automated restoration of setpoints
- Uses standardized interfaces, communication protocols and data models for consistent integration in operational workflows



The two projects pursue different but highly complementary objectives. Dynamic Line Rating increases available network capacity through the more efficient utilization of existing grid infrastructure, while Flexibility Management actively influences the behaviour of generation assets, energy storage systems, and, in the future, flexible consumers.

Only the interaction between both systems enables a technically optimized and economically efficient grid operation:

- Thermal Rating answers the question: “How much network capacity is actually available today and in the future?”
- Flex Management answers the question: “Which flexibility resources can be activated when the available network capacity is insufficient?”

## WAY FORWARD

The next step in the development journey is the closer integration of Dynamic Line Rating and Real-Time Flex Management into a unified platform for operational grid management. The objective is to jointly evaluate available network capacity, weather forecasts, load forecasts, generation forecasts, and available flexibility resources within a day-ahead planning horizon, enabling the derivation of optimal operational strategies and more proactive congestion management.