

## PROJECT SPOTLIGHT

# TenneT Grid Boosters Will Enhance Transmission Capacity and Help Reduce Costs for Customers in Germany



AUDORF IN SCHLESWIG-HOLSTEIN &  
OTTENHOFEN IN BAVARIA, GERMANY

## System Overview

- Ultrastack
- 2X 100MW / 100MWh
- Owned by TenneT TSO GmbH

## Applications

- Congestion Relief
- Grid Stability & Increased Power Line Utilization

## Project Summary

As the energy transition accelerates, the structure of our power grid does not align with future needs. In the north part of the country, the expansion of onshore and offshore wind plants is leading to high volumes of renewable generation, that did not exist previously. In the west and south of Germany many conventional power plants, including nuclear and coal power stations, are being shut down, but the levels of newly connected renewable generation are significantly lower. This makes those regions particularly dependent on energy transported from the north of Germany. It is predicted that western and southern federal states will have to import almost 40% of their annual energy consumption by 2035. The existing transmission networks were not designed to move the surplus of renewables from the north to south and delays in the construction of new power lines are further straining the situation. This requires the introduction of new and innovative technical solutions in grid management, such as the Grid Booster concept being deployed by TenneT in Germany.

TenneT is deploying two 100 MW Grid Booster systems in Audorf and Ottenhofen in Bavaria. The Grid Boosters will use Fluence Ultrastack, an advanced energy storage product that's designed to meet the high asset availability requirements of critical infrastructure. The battery-based energy storage systems will reduce system costs for consumers by minimizing the need for grid interventions, called redispatch, and reducing the need for grid expansion measures.

## Project Highlights

- TenneT's Grid Booster project will address congestion in the power grid and enhance the integration of additional electricity from renewable sources into the energy system. By strategically placing two Grid Boosters in the South and North of Germany, the project will reduce bottlenecks on the north-south transit axes.
- The project will increase the utilization of the German power grid by integrating energy storage as part of Germany's critical network infrastructure. Traditionally, high-voltage grids are operated according to the so-called n-1 principle. This means transmission lines are not fully utilized to be able to ensure safe operation in the event of a transmission line failure. Under the Grid Booster application, the battery assets will take over this n-1 redundancy requirement and relieve existing transmission lines of the need to hold back capacity.
- In the event of failures on the grid, a precise, coordinated, and immediate power input and withdrawal from the energy storage system will be initiated to prevent overloading the transmission grid or reduce it to permissible values. Activated solely during disruptions in the transmission grid, the Ottenhofen system will contribute 100 MW to the grid, while the Audorf system will draw 100 MW to counteract the overload resulting from the disruption.
- The Grid Booster system will enhance grid stability through its rapid-response capabilities. Increasing penetration of renewable energy onto the grid creates voltage volatility. As a result, the grid is more susceptible to voltage fluctuations and potential service disruption, which creates more need for dynamic voltage control. The ability of Grid Boosters to store surplus energy and release it when needed not only mitigates congestion but also acts as a stabilizing force, contributing to the overall resilience and reliability of the grid in the face of dynamic energy demands.



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