

# Energy transition applied: Storage facility saves time and money when expanding the grid

STEAG wind farm in Ullersdorf, Brandenburg, set to become a living lab

**Germany is going to have to vastly expand its power supply infrastructure. It has no alternative if the energy policy targets currently being formulated by the federal government are to be met, as the end of coal-fired power production scheduled for 2038 will mean further acceleration of the changeover from fossil fuels to renewable energies. However, the continuously increasing share of strongly fluctuating electricity volumes from wind and sun places high demands on grid expansion and system stability. This is where the STEAG, enercast and TU Dortmund University project “SteadyWind” comes into play, as battery storage facilities save time and money when expanding the grid.**

With their project outline “SteadyWind”, STEAG GmbH, enercast GmbH and TU Dortmund University with its renowned Institute of Energy Systems, Energy Efficiency and Energy Economics (ie3) are participating in the “Living labs for the energy transition” competition launched by the Federal Ministry for Economic Affairs and Energy (BMWi). The idea behind the competition is to test large energy storage facilities in the electricity sector in a real-world environment, and the German government has earmarked millions in subsidies for this purpose. A living lab of this kind is to be developed at the STEAG wind farm in Ullersdorf, Brandenburg, with a storage facility for steadying supply. The wind farm has a connected capacity of 43 megawatts (MW).

The “SteadyWind” project essentially consists of a large battery storage system that balances the electricity generation of the wind turbines in Ullersdorf in such a way that wind power is fed into the grid more evenly in the future. During high winds, the storage system smooths out the peaks on the spot. What this means in practice is that if output of more than 30 MW is generated, the excess power is stored and released into the grid at a later time when winds are lower. Storage systems for steadying supply thus reliably reduce the maximum feed-in. This significantly reduces the technical demands on

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the power transmission grid, which has to transport the wind power from the high-yield north of Germany to the large industrial consumers in the south of the country.

This storage technology could be used to connect a larger number of wind turbines to the existing power grid and integrate more electricity from renewable energies on an ongoing basis. STEAG presented a concept paper on this in December 2018, introducing it to the scientific and political debate. Building on the development work by the Essen-based energy company, the three project partners plan to make “SteadyWind” a prototype which can subsequently be rolled out to other locations throughout the country.

The partners estimate an investment volume in the mid double-digit million range. A battery storage facility with output of 13.2 MW and a capacity of 79.2 MWh is to be installed in Ullersdorf. A sodium-sulfur battery (NaS) enabling a long service life with a high number of charging cycles is planned as a new technology, presenting a distinct advantage over the lithium-ion batteries used so far.

### **STEAG GmbH**

STEAG is one of Germany’s leading energy producers and is shaping the energy transition at six power plant sites in Germany. For over 80 years, STEAG has stood nationally and internationally for efficient and reliable power generation. STEAG designs, develops, implements, operates and markets highly efficient power plants and storage facilities. As an experienced partner, STEAG supports its customers comprehensively and provides tailor-made solutions in the field of electricity and heat supply as well as a wide range of energy services. Since 2016, STEAG has been operating six large-scale battery systems with a total installed capacity of 90 MW. STEAG is one of the leading companies in the world with experience in the commercial operation of large-scale storage in commercial applications.

### **enercast GmbH**

Kassel-based enercast GmbH is a technology provider for applied artificial intelligence and the digital transformation of renewable energy. Its self-learning software-as-a-service products deliver accurate power forecasts for wind power and solar plants, thus enabling the reliable integration of renewable energy into power grids and energy markets. With its platform for the industrial application of artificial intelligence, enercast networks internal and external data, identifies patterns and summarizes them into meaningful forecasts. True to the motto “Weather data that put you in control”, these forecasts enable clients in the energy and industrial sectors to tap new business potential. enercast, which was founded in 2011, delivers 700,000 forecast data sets a day for 80 gigawatt (GW) of installed capacity to 18 countries worldwide.

### **Institute of Energy Systems, Energy Efficiency and Energy Economics (ie3) – TU Dortmund University**

ie3 is one of the leading German higher education institutes in the field of electrical networks, system integration of renewable energy sources and the resulting technical and economic issues. Research projects and studies carried out by the institute provide solutions for a technically operable and sustainable electricity system of the future. The research topics include flexible electrical transport and distribution networks, system integration of renewable energy sources and storage facilities, efficient use of energy and the electricity industry and markets.