

Media Release

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Innovative combination of wind and water – Voith to deliver pump turbines for first combination of wind and pumped storage power plant

2016-11-14

- **First wind/pumped storage hybrid power plant in the world equipped with Voith technology**
- **Milestone in energy transition**
- **Strong Partner in turbine development**

Gaildorf, Germany: The Naturstromspeicher Gaildorf is a natural energy storage plant combining a pumped storage hydro-electric power station with a wind farm. It uses the wind farms' four towers and bases with a total capacity of 160,000 m³ as water reservoirs. It is – worldwide – the first plant of its kind.

In late September Voith signed a contract to deliver the pump turbines for this special project. The three reversible Francis machines with a total output of 16 MW will be a core element in the plant. The principle behind the operation is both simple and ingenious. If there is a surplus of power, the pumped storage power station switches to pumping mode moving water from a lower reservoir to the higher storage basin in the wind towers. If the demand for electricity in the grid rises, water is released from the upper basin to the bottom via a penstock and causes the pump turbines to move. Within seconds, electricity is generated and fed back into the electricity grid.

Voith has been a strong partner in the project by contributing to the turbine development and adapting it to the special piping behavior and the long penstock. Alexander Schechner from the Naturspeicher GmbH states: "The Naturstromspeicher has been a very complex project in terms of Research and Development. In Voith we found an experienced partner understanding our needs."

“I am convinced of the project Naturstromspeicher for Gaildorf. Focusing on innovative technology we now spearhead the energy transition”, says Frank Zimmermann, Mayor of Gaildorf. The project marks a major step forward in using renewable energy sources to balance power demand and supply fluctuations since the combined wind and hydro power plant will balance power for fast-response grid stabilization.

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Both in industrial nations as well as in developing countries with a rising need for energy, production and consumption of electricity do not always run concurrently. There are daily fluctuations in the electricity grid. In the near future, power generation by wind and photovoltaic systems will be far above the load in case of strong wind or high solar radiation, and far below the load during an increase in demand hours. Pumped storage power plants are ideally suited worldwide in helping to even out these frequent changes between electricity shortages and surpluses which significantly prevent the curtailment of renewable energies. Modern systems need only thirty seconds to start up from a standstill and in the event of a black out, pumped storage power plants can support and control the complex grid restoration process due its unique black start ability. At present, they are the only available energy storage facilities that have undergone large-scale technical testing.

Hydropower is the largest, oldest and also most reliable form of renewable energy generation. Worldwide it makes an indispensable contribution to stable power supplies and hence to economic and social development – both in industrial countries and in emerging markets. At the same time, hydropower significantly contributes to climate-protecting energy generation. Voith has been a leading supplier of this technology since the early beginning, and continuously develops it further.

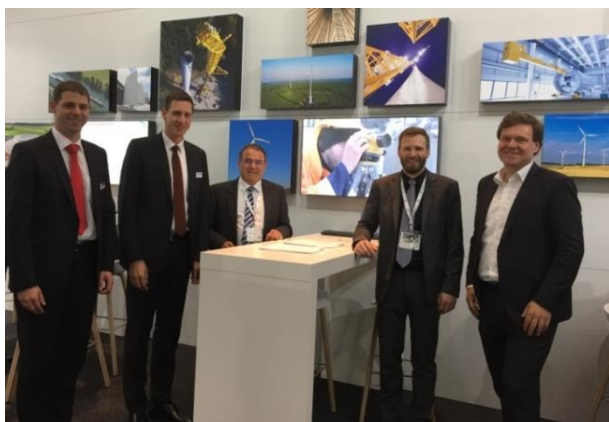
Voith sets standards in the markets for energy, oil & gas, paper, raw materials, transport & automotive. Founded in 1867, Voith employs around 20,000 people, generates €4.3 billion in sales, operates in over 60 countries around the world and is one of the largest family-owned companies in Europe.*

*Without the discontinued Group Division Voith Industrial Services.

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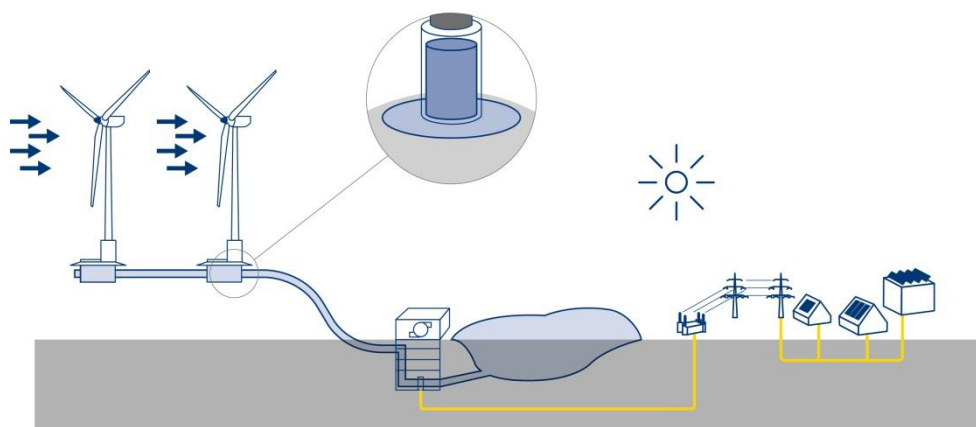
Caption 1: Contract signing for the supply of three reversible Francis pump turbines for the Gaildorf Naturstromspeicher.



Caption 2: With the Naturstromspeicher a wind farm can be turned into a highly versatile power plant.



Caption 3: The first Naturstromspeicher is under construction in Gaildorf in the Swabian-Franconian Forest.



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Caption 4: Using water to store energy from other renewables.

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