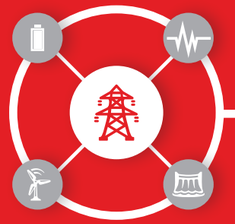
ABS in the power grid – a dynamic system for successful energy transition.



ABS4TSO Advanced Balancing Services for Transmission System Operators

Project coordinator

APG AUSTRIAN POWER GRID

Project partners

AIT AUSTRIAN INSTITUTE OF TECHNOLOGY

TU WIEN

Verbund

Project duration

May 2018 to April 2021

Project volume

2.6 Mio. EUR (excluding battery storage), of which EUR 1.8 million was provided by the Climate and Energy Fund under its Energy Research Programme.

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ABS IN THE POWER GRID

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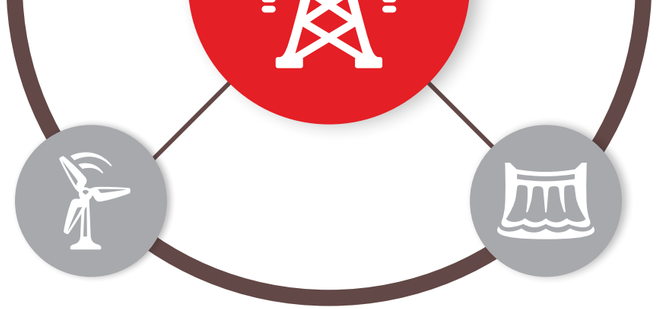
ABS4TSO



Expanding renewable energy

The growing share of renewable energy sources in the power supply system throughout Europe is transforming the situation in transmission and distribution grids fundamentally. However, the electricity system only works if power generation and consumption are precisely balanced at all times. This equilibrium is expressed in the grid frequency. A grid frequency of 50 Hertz indicates a balanced power supply, which means the system is stable.

Rising frequency variations

Transmission and distribution grids per se are practically unable to store energy. Thermal and hydraulic power plants are important factors in grid stability. When an imbalance between generation and consumption arises, the rotating masses of their alternators enable frequency variations to be reduced without a time lag. Thermal power plants in particular are increasingly being lost to the system due to market conditions. By contrast, generators of renewable energy such as wind power and photovoltaic plants are usually connected to the grid via inverters, which means they do not provide their own natural inertia mass and therefore do not readily have a frequency-stabilising effect on the system. This poses a challenge to the power supply system, increasingly sending it into a tailspin.

Tuning the power supply

New power plant facilities require new grid elements that can maintain the stabilising properties of the electricity system. Similar to the ABS assistance system in modern vehicles, with "ABS in the power grid" we are developing smart support systems for power grid operation that are able to compensate any unforeseen in adequacy of the present-day power grid.

Solution: Intelligent storage capacities

These developments mean that transmission system operators like APG need to take a closer look at frequency variations. The "ABS in the power grid" research project will now study how innovative a battery storage system can be used to handle frequency variations at a highly dynamic level. A new intelligent algorithm will react to the challenges described, thus helping to maintain security of supply.