UPGRADES MADE BY NORDEX

XTENDED POWER SOUND CONCEPT

Our new sound concept: reduce sound emissions, increase yield

› Depending on the location, wind turbines are subject to regulatory requirements to reduce sound emissions. Turbines are curtailed, for example, at night in their power production in order to comply with the building permission. This results in revenue losses on the part of the operator. With our new upgrade package, the **X**tended Power sound concept, we increase the performance of your turbine while keeping low sound emissions and complying with regulatory requirements.

NORDEX acciona Windpower

XTENDED POWER SOUND CONCEPT

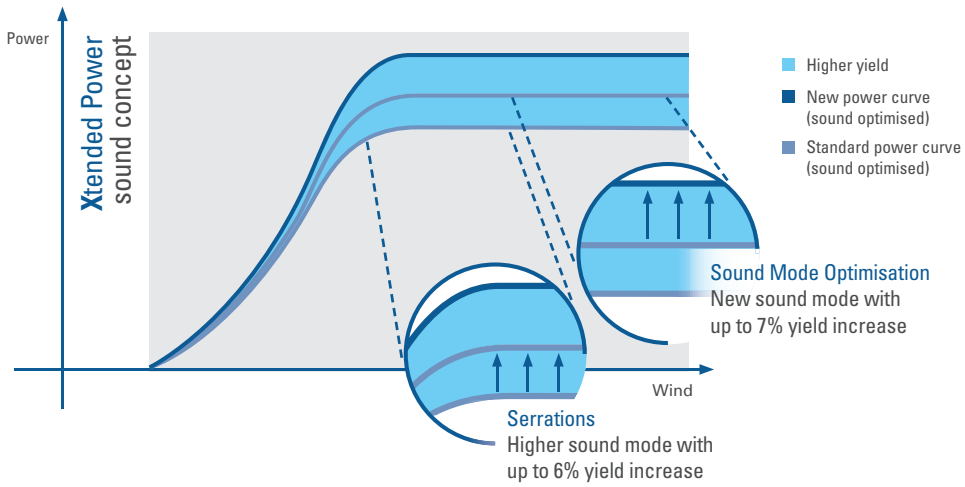
› Your benefit: more revenue despite sound-reduced operation
The two complementary products – Serrations and Sound Mode Optimisation – reduce sound emissions while simultaneously increasing performance. Result: more yield for the operator. In addition to the two products, the package includes a site-specific analysis of the potential for optimisation as well as the option of the Nordex Group performing a sound measurement required by the authorities.

Serrations: get the most out of existing operating modes
Serrations are thin, zig-zagged components attached to the rotor blade for sound reduction. They influence the turbulent trailing edge sound by replacing the straight edge of the rotor blade with a serrated one. This reduces the sound power level by around 1.5 decibels, allowing the turbine operator to switch to a higher mode of operation. The turbine's yield can thus be increased by up to 6 percent without exceeding regulatory specifications.

Sound Mode Optimisation: new operation for even higher performance
In order to operate turbines with reduced sound, the power must be curtailed. This is done by adjusting the speed and the torque of the generator. The rotational speed of the rotor blades and thus the generator speed must be reduced to achieve a sound reduction. The Sound Mode Optimisation upgrade allows an improvement of the power curve by a targeted increase of the torque while maintaining a stable rotor speed and low sound emission. Yield can be increased up to 7 percent this way.

Tailored, efficient implementation: site-specific analysis for your turbine
In the first step, the site-specific optimisation potential of your wind turbine is determined. Both upgrade products are designed to optimise the sound concept of your turbine. The Serrations installation is carried out by our rope technicians directly up-tower on the rotor blades. After the installation of the Serration components our engineers set the parameters. The system is then switched to a higher operating mode, resulting in a performance increase. For the Sound Mode Optimisation upgrade, a new operating mode can be set that further optimises the power curve during a sound-reduction. Depending on the site-specific optimisation potential, both products – Serrations and Sound Mode Optimisation – are also available separately.

The upgrade package **X**tended Power sound concept applies to our Delta and Gamma generation turbines.



› We are happy to provide you with an offer for the product package **X**tended Power sound concept. Please contact us.