



Smart Algorithms

Power Performance Optimisation

Smart algorithms to improve turbine operations

POWER PERFORMANCE OPTIMISATION

is a range of smart algorithms that improves the turbines ability to capture energy on the slope of the power curve. A part of Vestas **PowerPlus™**.

BENEFITS

- Increase AEP by up to 1.5%*
- Recover capital costs ahead of schedule
- Improved measurement accuracy

TURBINE PLATFORMS

Vestas wind turbines with VMP Global controller software.

Controller upgrades to VMP Global are available for a selection of turbines.

*Dependent on wind and site conditions

A wind turbine controller is in many ways the brain of the turbine. The information it provides is used to continuously optimise the turbine's ability to capture wind and increase production efficiency.

But, the effectiveness of the controller is highly dependent on the accuracy of the data inputs from the hundreds of sensors that captures real-time data in and on the turbine. Based on these data inputs, the controller instructs the turbine to pitch, yaw, or cut out, so inaccurate measurements of e.g. wind speed might lead the controller to provide less than optimal instructions to the turbine. This leads to significant amounts of uncaptured energy, directly impacting your business case negatively.

A smarter turbine is a more effective turbine

To help turbine owners uncover and realise the uncaptured energy, Vestas has developed a range of smart algorithms to help the turbine make better decisions. Improved measurements of wind speed, wind direction, and optimal yaw alignment enable the turbine to act smarter and thereby become more effective.

Moreover, our algorithmic features allow for smarter use of power boosts as well as allowing the turbine to exploit low air-density climatic conditions to operate in high winds.

Power Performance Optimisation Features

Adaptive Wind Sensing

Optimizes optimal yaw position based on peak power by automatic and continuous self-calibration.

Wind Speed Estimator

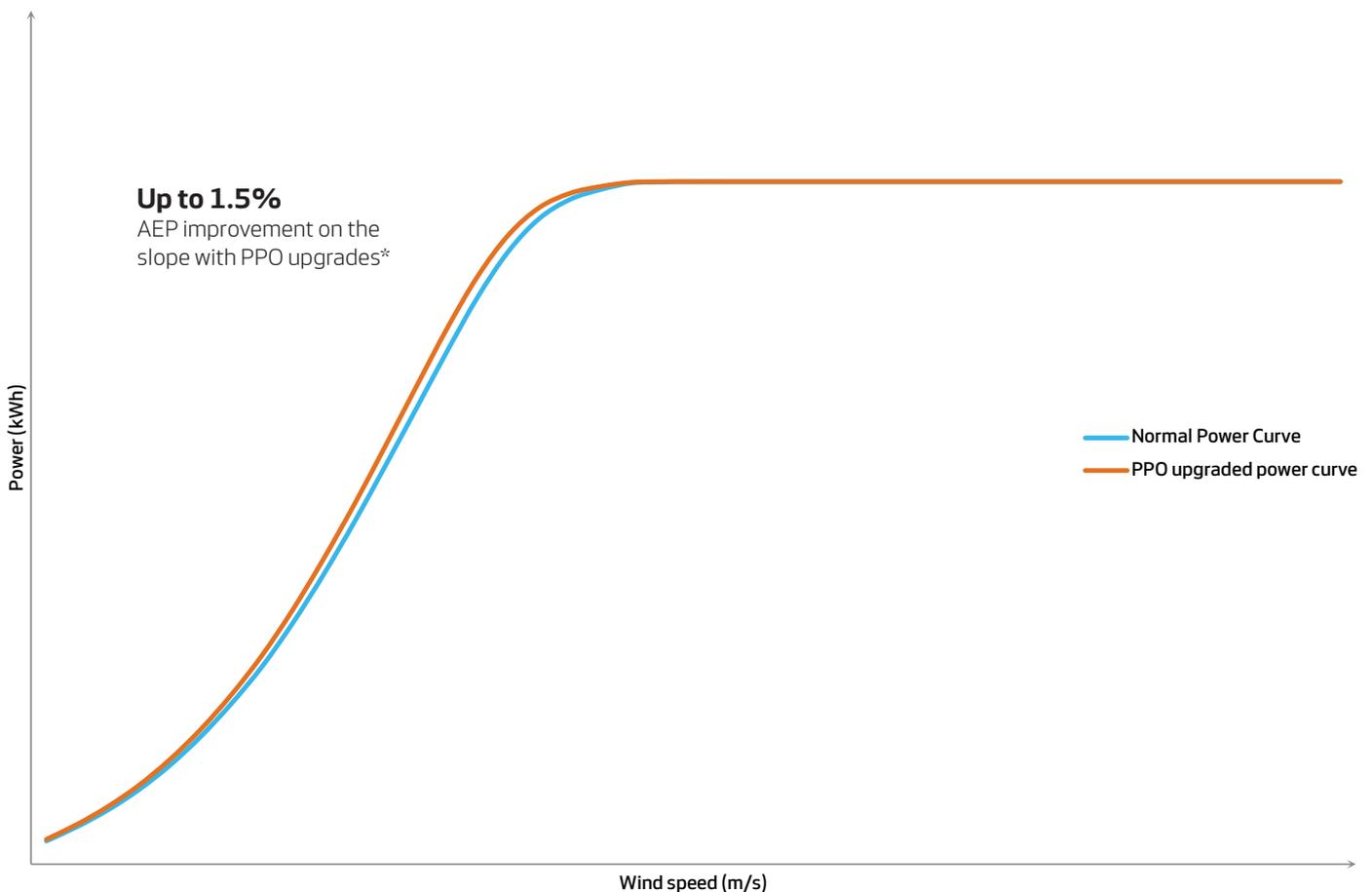
Improves the wind speed measurement process by calculating the wind speed from the turbine's pitch, speed, and power readings.

Extended Power Boost

Improves the power performance around knee of the power curve by boosting of power for short intervals.

Variable Thrust Limiter

Improves power performance around knee of the power curve by enabling an air density-dependent thrust limiter.



*Dependent on turbine-specific conditions

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